

# **Cough, Sniffle, Sneeze**

How to Get Optimal Health Care for Common Health  
Problems

Raymond Lengel, MSN, FNP-BC, RN

First Edition

Mini-Medical School  
North Ridgeville, Ohio

Cough, Sniffle, Sneeze:  
How to Get Optimal Health Care for Common Health Problems  
By Raymond Lengel

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## **About the Author**

Raymond Lengel, a certified family nurse practitioner, has worked in multiple fields of nursing. For the last seven years he has worked in primary care. In addition to being a certified family nurse practitioner he is a registered nurse with the state of Ohio.

Initially, Raymond received a Bachelor of Science degree in exercise science from the Ohio State University. Then he attained a Bachelor of Science degree in nursing from the Allen College of Nursing in Waterloo, Iowa. After working for a number of years as an exercise physiologist/registered nurse he enrolled at Otterbein College in Westerville, Ohio and got a Master of Science degree in nursing.

His writing career includes over 80 on-line continuing educational courses developed for nurses. Two articles in the magazine *Long Term Care Interface* and one in *Clinical Reviews* have been published.

He is also the author of the book, *Health Care Responsibility: The Older Adult's Guide to Surviving the Health Care System*, which was published in 2006.

Raymond has also presented a number of lectures on a multitude of health care topics including influenza, cardiac risk reduction, stress management, exercise and nutrition.

## **Disclaimer**

This book is designed to provide basic information about the health care system and the patient's role in helping to manage his or her own health. It is sold with the understanding that each individual is unique and the book cannot provide individual advice to any one person.

This book is meant to compliment and enhance your interaction with the health care system not to serve as an alternative to medical advice or care. Utilize the system presented in this book, but be sure to work with your doctor. Your doctor is the best source of health care information for you and the unique set of conditions that are present in your body. The goal of this book is to help you with the interaction between you and your doctor, not replace it.

The author has extended every effort to make sure this book is complete and as accurate as possible. Medicine is an evolving field and ongoing research may raise some questions about some of the data in the book. There may be mistakes, both in content and typographical. The book should be used as a general guide and not as the final source for your health care information. Information is current only up to the printing date.

The goal of this book is to educate and entertain. The author and publisher will not have liability or responsibility to any person or entity for any loss or damage that have been caused by information in this book

## Prologue

*Tuesday*

Jenny is a vibrant, athletic eight year-old girl. She is the only child of Dale and Kristen Smith. Jenny is well known at her doctor's office, as she is, as the nurse calls her, "a regular customer".

Kristen brings Jenny into the doctor's office six or seven times a year for a variety of infections including: common colds, sinus infections, sore throats, bronchitis and ear infections. Over the eight years of her life she has averaged about seven annual health care visits and 4 rounds of antibiotics each year.

Other than her frequent infections, she is generally healthy. She suffers from no chronic diseases, has had no surgeries, and has no allergies to medication. She was hospitalized one time when she was two for a viral respiratory tract infection called respiratory syncytial virus or RSV.

Her mother reports that she did not sleep well last night and awoke with ear pain. Ibuprofen helped Jenny get back to sleep. In the morning, she did not want to eat her breakfast and her mother noticed she was, "burning up" when she touched her skin. Her temperature reading was 100.8 degrees Fahrenheit.

Jenny had been complaining of the sniffles for the last few days and her mother had been contemplating bringing her into the pediatrician's office. With the new complaint of ear pain and fever, there was no question.

Jenny immediately called the doctor's office and secured an appointment for 11:15 am. Kristen covered Jenny with a blanket, let her lie on the couch and gave her a glass of lemon-lime soda. She gave her a dose of Tylenol and within 30 minutes Jenny was feeling much better.

"Good morning, Jenny", chirped a plump rosy checked nurse as she walked through the door.

Jenny's face lit up as she noticed her favorite nurse. "Hi, there Nurse Betty. I did not see you last time I was here."

"Yes, I was in Mexico on vacation. My son got married."

"He is a teacher at our school. I like him".

"He says that all the teachers love you."

Jenny blushed as the nurse continued, "What is wrong today sweetie?"

“My ear hurts and I have a fever”

“Dr. Mack will take good care of you, don’t you worry.” Let me just check your temperature.

After a complete nursing assessment, Dr. Mack entered the room and Nurse Betty exited to assess her next patient. Dr. Mack is a kind physician of about 40 with steel blue eyes and graying hair around the temples. He is loved by all of his patients. He is described as a man who would never get in a fight with anyone and is a great listener.

“Your not feeling so good today are you Jenny,” questioned Dr. Mack with a look a genuine concern on his face. “How was that last medicine that I gave you?”

“That was my favorite one yet. It tasted just like strawberries,” said Jenny with an excited look on her face.

Interrupting Jenny and Dr. Mack’s conversation, Kristen interjected, “She has another ear infection, I think she should get another z-pack”.

(Z-pack is an antibiotic with the generic name azithromycin that comes in a convenient dosing package for adults and is commonly known as the z-pack).

“Let’s just take a look at her before we decide what to do,” Dr. Mack said as he smiled warmly at Kristen.

After the questioning and examination Dr. Mack confirmed that Jenny had an ear infection. “I would like to put her on amoxicillin-clavulanate,” Dr. Mack explained, “She was on the z-pack two months ago and cefdinir last month. I am concerned that those antibiotics may not be as effective and this medication is a little bit stronger.”

Dr. Mack prescribed her amoxicillin-clavulanate acid twice a day for 7 days.

### **Friday**

Jenny presents back to the office with continued ear pain and a fever of 102.3 degrees Fahrenheit. Jenny is unable to keep food down and is having pain that is radiating down her neck and behind her ear.

Jenny is lying quietly on the exam table with her father and mother sitting at her side. Dr. Mack enters the room and has a great look of alarm on his face when he sees the condition of Jenny. His exam reveals a lethargic child with

tenderness and swelling of the ear. Her eardrum is still infected, but it now has Nipple like protrusion that is oozing pus.

Dr. Mack directly admits Jenny to the hospital and gets an ear, nose, throat (ENT) doctor to look at Jenny immediately.

Dr. Patel, the pediatric ENT doctor, sees Jenny within three hours of her being admitted to the hospital. Dr. Patel performs a procedure called a tympanocentesis, where he collects the fluid from behind the ear and sends it off to the lab.

In addition he performs a myriad of blood work to evaluate the severity of the infection. Lastly, he orders a CT scan of Jenny's temporal bone. Because of the toxic appearance of the child a lumbar puncture also known as a spinal tap is done to rule out infection in the central nervous system.

After the fluid from behind the ear was collected and the blood was drawn Jenny was started on a combination of intravenous antibiotics.

Later that night the blood work came back, which showed a significant bacterial infection.

Jenny seemed to be doing better over night but the next day her repeat blood work showed a spike in white blood cells and she became more lethargic. There was concern of an abscess formation in the intra-cranial space and a neurosurgeon was called in.

Prior to the neurosurgeon seeing Jenny the blood cultures and cultures of the pus in the ear returned. Both cultures revealed the same result – *Streptococcus pneumoniae*. The scariest part of the results was the sensitivity report. The sensitivity report showed that the Streptococcus was not treatable by any antibiotic.

## **Introduction**

Health care is expensive. Not only in dollars and cents, but also in time. A patient can call for an appointment, be told they can be squeezed into the doctor's busy schedule tomorrow at 3 PM, and then not be seen until 5 PM the next day.

This problem is likely to get worse as time passes as fewer and fewer doctors are choosing to go into primary care medicine specialties such as pediatrics, family practice, geriatrics and internal medicine. Instead doctors are opting for more lucrative specialties – and why not when many specialties pay over twice the annual salary of a primary care provider.

The use of mid-level providers, such as the nurse practitioner or the physician assistant, will help ease the shortage. None-the-less it is critical that patients learn to take care of themselves and know when they should go to the doctor and when a trial over the counter medications or other measures can be helpful.

This book will look at helping the reader understand how to take care of themselves. It will focus on the care of common conditions that are associated with nasal congestion, fever, sore throat, sneezing and cough.

It will focus on a number of objectives.

1. Help the reader self-manage common conditions associated with sore throat, nasal congestion, fever, earache and cough.
2. Help the reader understand when their doctor could help one of these common conditions.
3. Help the reader understand when serious illness may be present and when they need to be seen by a doctor.
4. Help the reader understand how to use over the counter medications and home remedies to fight disease.
5. Help the reader assume responsibility for their health.
6. Reduce the incidence of the antibiotic use.
7. Reduce health care costs and reduce the need for using the health care system.

Why do people go to the doctor when they are acutely ill? There are many reasons. Four things that health care consumer want is:

- To feel better
- To know what is wrong
- To feel reassured when the doctor tells them what is wrong
- Antibiotics

If patients are empowered with the knowledge to understand minor health illnesses and how to manage them a great number of doctor visits can be eliminated.

The goal of this book is to help the reader accomplish the first three factors listed above. It will also help the reader understand that antibiotics are often not needed, even when many people think they should be prescribed.

In an informal study of patients presenting to a retail health clinic with a self-described sinus infection over a two-month period, 96 patients were evaluated. Of the 96 patients, only 29 patients meet criteria for a bacterial sinus infection. The remaining 67 patients came into the clinic with the thought that an antibiotic would help their condition. According to guidelines these 67 patients would not have been helped by antibiotics. What they needed was time and possibly some over the counter medication.

With this in mind, patients need to understand when they need to go to the doctor and when a trail of home remedies can help. They also need to know when the intervention of a trained health care provider is necessary.

## **Objectives**

### **Objective One: Self-manage common conditions associated with sore throat, nasal congestion, fever, earache and cough**

This goal is not meant to make you physician, but help you understand your role in managing common infectious diseases or conditions. By the end of the book you will have a better understand of when to go to the doctor and when self-management of your current ailment is a reasonable option. Understanding how to utilize home remedies and over the counter medications will be highlighted.

## **Objective Two: Understand when a doctor or another health care provider could help a common condition**

Again, you will not be qualified to sit for medical boards after reading this book, but should have a basic understanding about common conditions that afflict millions of people each year and what can be done about them.

For example, viruses most commonly cause sore throats. Many people go to the doctor with a sore throat thinking that an antibiotic will cure their ailment. Patients who have the understanding that antibiotics do not cure the majority of sore throats (even if they feel horrible) will be less inclined to insist on one.

This is not meant to say that a trip to the clinician's office is not beneficial in sore throat. Group A beta hemolytic streptococcus – also known as strep throat – needs to be ruled out in select patients. This is one of the few sore throats that can benefit by the use of an antibiotic (but not as much as people generally think – more on that later).

## **Objective Three: Understand when serious illness may be present and when physician input is important**

While many conditions can be self-managed, there are times that the input from a trained health care provider can be life-saving. Each chapter that discusses a disease will include a “red flags” section that will outline what conditions are potentially life threatening or could lead to serious complications without proper interventions.

Most conditions that cause sore throat, nasal congestion, sneezing or ear pain are not life threatening. The human body is an amazing machine that has the ability to fight off many ailments. Many people have the false understanding that a trip to the doctor's office can lead to immediate relief of their symptoms. For these symptoms, health care providers do not have a magic bullet.

By the end of the book, you should have an understanding that the body is able to fight off most infections with its own immune system. This is not always true; there are certain individuals with underlying diseases that render their immune system less able to ward off disease. Likewise, there are certain conditions that require extra interventions. Overall, Americans believe that antibiotics need to be used much more frequently than they need to be.

#### **Objective Four: Understand how to use over the counter medications and home remedies to fight disease**

Years ago much health care advice and treatment happened at drug stores. Today, much benefit can be derived from the drug store, but its use is tremendously underutilized. Over the counter medications have the potential to improve comfort and hasten disease progression. Unfortunately, drug stores or the medicine aisle at the grocery store is laced with a multitude of products that is very confusing to the average consumer.

This book will look at many conditions and describe how the drug store can be used to manage many of these conditions.

Grandma's remedies – which are often thought of as old wives' tales – may have some validity. Recent research has shown that many things once believed to be a wives' tale are actually beneficial. For example, recent research has shown that honey is more effective for treating a cough than over the counter cough medicine.

#### **Objective Five: Assume responsibility for health**

The health care system is overburdened, fragmented and as a whole not concerned about your health as much as you are. Each patient must assume responsibility for his or her own health.

Running to the doctor, urgent clinic or emergency room is not necessarily the best option for every situation. Health care providers often do things to appease the patient instead of doing the right thing. For example, ear infections will often clear without antibiotics, but if you go to the doctor in the United States and an ear infection is diagnosed, almost every time an antibiotic is prescribed. The benefit of the antibiotic is probably not greater than the risk for many ear infections. More about this in the section on earaches.

The World Health Organization ranks that the United States as the 37<sup>th</sup> best health care system in the world<sup>1</sup>. America's health care system is fraught problems and its patient satisfaction is rated very low. In the developed world, American's health care system is ranked at the bottom of many indicators such as infant mortality and life expectancy.

Doctor appointments, in the eyes of many patients, are sub-par. Health care

visits are typically about 15 minutes. The health care provider has a lot of work to do in that short visit. The health care provider needs to review the chart, talk to the patient, examine the patient, write in the chart, answer questions, fill out forms and dispense prescriptions. Time limits placed on office visits do not allow the health care provider to spend adequate time with the patient.

Long waits in the emergency room, urgent care setting or doctor office is considered normal. Many things can slow a physician down every day, which can delay the rest of the schedule. In order to maximize time utilization, health care providers schedules are filled up and sometimes even double or triple booked. One small problem in the day can throw the whole schedule behind.

Health care consumers need to maximize this short time with the doctor. This includes being organized and knowing how to communicate with the health care system. Some doctor's practice under the assumption that doctor knows best and do not feel it is necessary to share all information with their patients.

Health care consumers are ultimately responsible for their health and need to act accordingly. Many things can be done for many different conditions, symptoms and ailments that do not require the input of the health care system. The health care system is in need of many changes and people need to realize that they need to take responsibility for their health.

### **Objective Six: Reduced antibiotic use**

Each section of this book will look at a specific condition. Many conditions discussed often use antibiotics in their treatment. Many infections – including presumed bacterial infections - will clear on their own without the assistance of antibiotics. The human body is a powerful healer. Some conditions warrant just time to allow the body to heal the infection. This is not true for all conditions. Some conditions require antibiotics or serious complications including death may ensue.

Antibiotic resistance is becoming a major problem. The development of resistant strains of bacteria leave health care providers with limited means to fight disease. Resistant organisms are partly the result of the overuse of antibiotics.

By the end of this book the reader will understand their role in reducing antibiotic use. Many people falsely assume it is only the health care provider who is responsible for prescribing antibiotics, but as you will see it is a complex interaction between the patient and health care provider that leads to an antibiotic prescription. Antibiotic use is far too often based on convenience instead of good science.

**Objective Seven: Reduce health care costs and the utilization of the health care system**

Health care in America is the more expensive than in any other country. In 2006, the United States spent \$7,421 in per capita health expenditures, which is over 50 percent more than any other country<sup>2</sup>. Multiple factors contribute to this high health care cost that are out of control of the average health care consumer such as the overuse of medications, top rate medical technologies, the extensive use of diagnostic tests, salaries of doctors and hospital administrators, government regulations and increasing life expectancy.

Many patients run to the doctor at the first sign of a cold. An educated patient will understand that for most colds a doctor can do no more than recommend rest, good nutrition, home remedies and some over the counter medications in its management. Yet, running to the doctor will increase health care costs.

Educated consumers will be able to manage many disease states with home remedies and over the counter medications. This will reduce the need for health care visits and unnecessary antibiotic prescriptions.

This book's task is large. Health care is a limited resource and it needs to be treated properly – by both doctor and patient. The business behind medicine looks to make money – often at the expense of patients. On the other hand, many patients enter the health care system, uninformed or misinformed, which leads inadequate care.

Patients need to be empowered with knowledge to receive optimal health care.

## **Chapter 1: Common Problems with Antibiotic Use**

It was a warm spring day and *I was driving my three-year-old son down the road. I looked in the rear view mirror and asked him, "I am a good dad or a bad dad?"*

*Without hesitation he responded, "You are a good dad because you take me to McDonalds".*

*I love McDonalds, but let's face it, there are some not so healthy food choices there. My son likes to eat chicken nuggets, French fries and chocolate milk. This meal is not the healthiest and should not be a staple of anyone's diet.*

*One day at the dinner table, my wife was trying to make him eat some green beans. He was refusing to eat the green beans and it took her about 45 minutes to convince him to eat them. During their argument he brought up the fact that he likes me better because I give him French fries.*

*The fact that I do what he wants does not make me a good dad. And the fact that my wife makes him eat green beans does not make her a bad mom. My three-year-old son just does not understand the best course of action.*

*When I listened to a patient of mine telling me how she loves her doctor because he always gives her an antibiotic, I was taken back to my son. The patient went on to explain, that she gets frequent ear infections. Every time she goes in to see her doctor he puts her on an antibiotic, even if it is just a mild ear infection. "Even when he doesn't think it is a bad ear infection he gives me an antibiotic".*

*She went on to explain that she refuses to go back to the urgent care center down the road because they do not give her the antibiotic that she knows she needs.*

*Just because the urgent care center doesn't give her the antibiotic, this does not make them bad. And just because her doctor gives her an antibiotic doesn't make him a good doctor. The patient just does not understand the best course of action.*

The opening story about Jenny is quite concerning. It is a fictitious story, but may become a common occurrence if inhabitants of earth and most specifically Americans continue to use antibiotics the way we do. Antibiotics will not work.

Infectious diseases that are easily cured today may lead to death in the near future.

Antibiotics kill or inhibit the growth of bacteria. In 1928, Alexander Fleming accidentally discovered penicillin, but it was not routinely used until the early 1940's. With the help of Ernst Chain and Howard Florey, penicillin was purified and was able to be used. Amazingly resistance was noted only three years after it was introduced in the mid 1940's.

The first commercially available antibiotic was Prontosil, which was available in the late 1930's. This was a sulfa drug that was effective at killing multiple types of bacteria. It was developed in Germany and was effective against a type of bacteria called gram-positive cocci.

Antibiotics have changed the way medicine is practiced and has saved many lives. In today's health care setting, antibiotics are used too frequently and their effectiveness has been minimized by their overuse. Over the last 10 years most bacteria have developed some degree of antibiotic resistance.

Forty-five million antibiotics are prescribed each year<sup>3</sup>. Antibiotic prescriptions are written far too often for conditions that do not necessitate an antibiotic. Forty-four percent of those with a common cold, 75% of those with bronchitis and 46% of those with an upper respiratory tract infection are given an antibiotic<sup>4</sup>. These conditions will be discussed later, but most of the time each condition does NOT require an antibiotic. How is that for over prescribing?

### **Uses for antibiotics**

Antibiotics are indicated for many infectious illnesses. Even when an antibiotic is indicated, it is not always necessary. For example, multiple antibiotics are indicated for inner ear infections (acute otitis media), but antibiotics are not always needed in the management of ear infections. The body is perfectly capable of fighting off many cases of ear infections.

Primary reasons antibiotics are given in the outpatient primary care setting include<sup>3</sup>:

- Ear infection – 22%
- Sore throat– 19%
- Sinusitis – 17%

- Upper respiratory tract infections – 17%
- Bronchitis – 17%

A more complete discussion will follow about all of the above listed conditions. The use of antibiotics in the management of each condition is sometimes appropriate, but not always necessary. A chapter or two will be dedicated to each of the above conditions to help you understand when antibiotics are necessary.

### **Overuse of Antibiotics**

Antibiotics are overused. Multiple reasons exist to explain why antibiotics are given more often than they are needed. Some examples include the health care provider:

- Is unaware that an antibiotic is not the ideal treatment.
- Often underestimates the harm that can come from antibiotics.
- Is unaware of the cause of the symptoms and consequently treats the patient to avoid missing a bacterial cause of the symptoms and risk the development of complications.
- Gives into pressure from patients or perceived pressure from patients. Patients who ask for an antibiotic or give off clues that an antibiotic is what they desire are more likely to get one. Patients often feel that an antibiotic is the reason that the patient makes an appointment. If they do not get an antibiotic they feel that they have wasted their time and money. Clinicians do not want to disappoint patients and often cater to their needs.

Prescribing antibiotics is a cycle. For example, a patient has a viral illness and present to their doctor reporting that they have had a runny nose for three days. Today the nasal discharge changed from clear to thick green. An antibiotic is given and the patient is better in two to three days.

The patient would have gotten better if they took the antibiotic or they did not take the antibiotic, but the patient will attribute getting better to taking the antibiotic. The next time they get a viral infection they will want and expect an antibiotic.

One of the most common reasons an antibiotic is given is for the common cold. More than two hundred viruses have the potential to cause the common cold.

The most common presentation is the cold starting out with a sore throat followed by nasal congestion, cough, fever (which lasts 2-3 days), sneezing and headache. Nasal discharge starts clear and thin, but often becomes thick and turns yellow or green after about 3-4 days. The common cold typically lasts between 7-11 days.

The common cold does not warrant an antibiotic and does warrant symptomatic treatment. You should watch for any bacterial complications after a cold. This may include persistent fever and symptoms such as purulent nasal discharge, facial pain that increases with bending over, persistent headache and a poor response to decongestants that lasts longer than 10 to 14 days.

### **Complications of antibiotics**

Many reasons exist to not use antibiotics. The reasons range from life threatening to minor annoyances. Resistance, side effects, drug interactions are common reasons to avoid antibiotics.

### **Antibiotic Resistance**

Antibiotic resistance occurs over time as organisms improve their ability to survive when attacked by antibiotics. Resistance is not a new phenomenon. Before penicillin was even available for public use, the research team that helped bring it into clinical use demonstrated that *Staphylococcus* was able to develop resistance to it.

After its development, penicillin was used inappropriately. It was put in multiple products including soap, throat medication and mouthwash. By the late 1940's almost seventy percent of *Staphylococcus aureus* (a bacteria that commonly causes skin infections) was resistant to penicillin.

Resistance appears as the resistant bacteria survives the attack of antibiotics and then multiply. The surviving bacteria are stronger and able to survive the next attack by antibiotics. The molecular causes of resistance are variable and are beyond the scope of this book.

## Causes of antibiotic resistance

Multiple reasons contribute to antibiotics resistance.

- Improper prescribing the dose based on the person's weight may lead to incomplete eradication of the bacteria.
- Prescribing antibiotics inappropriately also contributes to resistance, such as prescribing an antibiotic for a viral infection.
- Patients who do not take the entire course of antibiotics or take the antibiotic incorrectly facilitate resistance. When the antibiotic is only taken for 5 days when it should have been taken for 10 days, not all the bacteria are killed off. The strongest bacteria remain. Now they have seen that antibiotic in the past and may have learned a way to fight that antibiotic so it is no longer effective in its eradication.
- Agriculture also contributes to antibiotic resistance as antibiotics are often given to farm animals as growth promoters in the absence of disease. Organisms that come from animals such as *Salmonella*, *Campylobacter*, *Escherichia coli*, and *Enterococcus* have contributed to the development of antibiotic resistance because of antibiotics used in animals.

## Severity of the problem

Some bacteria are now resistant to more than one and in some cases all antibiotics. Treatment of antibiotic resistant infections costs the United States 4-5 billion dollars every year.

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacterium that gets a lot of press. *Staphylococcus*, more commonly known as Staph, has been around for a long time. It commonly causes skin infection and other types of infections such as pneumonia or blood stream infections.

More recently Staph has become resistant to certain antibiotics. It is a strain of *Staphylococcus aureus* that is resistant to methicillin. Methicillin is synthetic penicillin, which is rarely used today. MRSA represents a bacterium that is resistant to penicillin.

*Staphylococcus* infections occur when there is skin-to-skin contact with someone who is infected, or contact with an object that is infected with

*Staphylococcus*. It is more common in those with poor hygiene or those living in crowded conditions. It can get into the body through openings in the skin.

*Staphylococcus aureus* is carried in the nose or on the skin in up to half of the population. These carriers typically do not get sick from the organism, but are said to be colonized. If *Staphylococcus* is able to get into the body, infection may ensue.

MRSA is very common in the hospital, but it has recently spread to the community. MRSA has been seen far to common among athletes. Many notable professional football players have been afflicted with MRSA infections. It is possible to get MRSA by sharing towels, razors, clothes and washcloths. It is also often received when illegal tattoos are given.

When MRSA affects the skin and presents with redness, pain, swelling, warmth and pus-filled pimples or boils.

#### **Tips for preventing MRSA**

- Do not share clothes, washcloths, towels, lotions, creams or razors
- Clean any area of broken skin and cover any sore
- Frequently wash your hand with soap and water or an alcohol based sanitizer
- Shower in warm water and wash completely after participating in contact sports
- Clean sporting equipment

#### **Side effects of antibiotics**

Side effects are a common problem associated with antibiotic use. While many side effects are specific to individual medications, some side effects are common across a variety of medications. Common side effects with antibiotics prescribed for common infections include: allergic reactions, diarrhea, nausea, vomiting and yeast infections.

*Clostridium difficile* is a bacterial infection that results in diarrhea. The diarrhea can range from mild to life threatening. It usually occurs after antibiotic use and is more common in those who are older and/or live in the nursing home or have recently been in the hospital.

*Clostridium difficile* often goes away when the antibiotic is stopped. Those with more severe disease may need antibiotic treatment. If diarrhea lasts more than three days, there are more than 3 episodes of diarrhea per day, there is a fever, blood in the stool, or severe abdominal pain or cramping than a visit to the doctor is important.

The greatest risk of antibiotics is allergic reaction. Most allergic reactions are mild, but some can be severe. Swelling of the throat can occur and may lead to death. This is not common, but it can happen. Always report any allergic reaction to every health care provider you see. Include the type of reaction. For example, was it hives, a rash or an upset stomach? Be specific.

### **Drug Interactions**

Drug interactions are also specific to medications but certain medications have an effect across multiple classes of antibiotics. Drugs can interact with multiple things including other drugs, food or disease states. Therefore, caution must be utilized in every instance of taking a new drug.

Drug interactions may reduce the efficacy of the medication, increase the effects of the drugs or intensify the side effects. This can result in one or both of the drugs causing harm to the body or one or both of the drugs not working.

When ever a new drug is added it is important to check with your health care provider or pharmacist to determine if there is an interaction. This is especially important if you are on multiple drugs. Key questions to ask are included in Table 1.

*Table 1: Questions to ask you health care provider about new drugs*

- Is this drug safe to take with other drugs I am taking?
- How long will this drug be active in my body?
- Should certain foods, drinks or other products be avoided when taking this drug?
- What are some potential drug interactions to watch for?
- Where can I find more information?

The efficacy of the contraceptive pill is reduced by antibiotic therapy. Not all studies conclusively agree with this statement. None-the-less it recommended to use a back up contraceptive method for individuals on oral contraceptives and antimicrobial therapy

Alcohol is another medication that does not interact well with antibiotics. Some antibiotics are more problematic than others. [Trimethoprim-sulfamethoxazole, metronidazole and some cephalosporins](#) have more significant interactions with alcohol. The use of alcohol with antibiotics is generally not recommended. Alcohol may reduce the level of doxycycline and erythromycin succinate.

If you are on multiple medications, the addition of antibiotics or even over the counter medications have the risk of having a combined effect and either increasing the activity or reducing the activity of one of the other medications.

While it is impossible to provide a complete list of drug interactions. Included is a [table](#) that provides a list of common over the counter medications with potential interactions.

### **Strategies to improve antibiotic use**

Appropriate use of antibiotics will result in fewer adverse events, less antibiotic resistance and more effective future use of antibiotics. Patients and health care providers alike have a responsibility to use antibiotics safely and judiciously.

Education is a key strategy in the improvement of the use of antibiotics. Education needs to occur on many levels. Clinicians need to have a firm grasp on guidelines for diagnosing and treating illnesses. They need to be able to reliably differentiate between a bacterial and viral infection. Clinicians need to be able to prescribe the correct antibiotic in the proper dose for the proper amount of time.

There is not much you can do as a health care consumer to assure that your doctor follows proper guidelines with the possible exception of going to a good doctor. But, there are strategies you should follow.

Doctors are more prone to prescribe antibiotic to patients who they think expect them, but they do a poor job determining who expects them. Doctor's

only identify about 25% of patients who expect antibiotics<sup>5</sup>. Therefore, health care consumers should not demand antibiotics for every illness.

Consumers are not trained health care providers, but they ideally should have a general grasp of clinical guidelines for common health care problems. Many people may argue with this statement, but I think it is critical. If you understand what science has shown about the use of antibiotics, you will be less likely to place pressure on clinicians to prescribe antibiotics. Health care providers are highly influenced by the patient's desire.

Many of us grew up or had parents that grew up in the era of antibiotics coming into common use. Penicillin was thought to be such a great product it was put into products such as soaps and mouthwashes. Many people have misinformation about antibiotic use.

Antibiotics were hailed as a magic bullet in the 1940's as it was able to save many patients who would have died before antibiotics became available. Many times antibiotics can be life saving, sometimes they can reduce the duration of the illness and sometimes they do not help at all.

Education can come in the form of public education efforts as well as one-on-one education in the office. The more a patient can be educated, the more likely they will want to avoid the use of antibiotics. Key points for discussion between patient and health care provider in the face of an acute illness include:

- The cause of the illness making the patient sick
- The optimal treatment plan including the necessity (or non-necessity) for antibiotics
- Over the counter medications and other remedies that can help reduce symptoms

Preventing infections will also help reduce the incidence of antibiotic misuse. When there is less infection, there is less chance that antibiotics will need to be used or used incorrectly.

Multiple strategies should be implemented to reduce the risk of common infectious diseases.

- Frequent hand washing with soap and water

- Carry around a bottle of alcohol based sanitizer and wash your hands regularly
- Vaccination (including routine childhood vaccinations as well as the flu shot and pneumococcal vaccine) reduces illnesses that need antibiotics
- Avoid places where there are a lot of sick people
- Use a tissue when you cough or sneeze and do not cough or sneeze into your hands. If you have to cough or sneeze do it into a tissue or your arm.
- Live a healthy lifestyle. This includes: exercising, eating well, not smoking, drinking adequate fluid and getting adequate rest.
- Use a virus killing disinfectant and disinfect items commonly touched as viruses can live on surfaces for hours and sometimes longer.
- Use nasal saline regularly – especially in the winter or in low humidity environments.

### **Ways to improve the health of America**

How can we accomplish the goals laid out in this book? It will require two major steps.

1. Improve clinician's skills to NOT prescribe antibiotics
2. Educate American society about infectious disease, how to manage it and the risks and harms of antibiotics

Step number one is out of the hands of most Americans, but it is important to understand none-the-less. Health care providers – including everyone from the doctors who prescribe the medication, to the pharmacists who dispense the medication, to the nurses who give the medication, to the aids who care for the patients – should understand the clinical utility of antibiotics. A consistent message across the board will reduce mixed signals being sent.

The American public needs a re-education. Over the last 60 years, antibiotics have become a remedy of far too many illnesses. People are misinformed about their use and under informed about their risk. This puts the health care system in extreme jeopardy.

*A common scenario*

*Joan F, a thirty-three year-old female, presents to the pharmacist of her local drug store with a complaint of a cough. "I have been taking this nasal*

*decongestant for about five or six days and while I feel better, I am still coughing and I have a little nasal congestion”.*

*The pharmacist looks at the back of the box and it reads that she should see her doctor if symptoms last beyond 7 days. The pharmacist points this out to the patient and encourages her to make an appointment with her doctor in the next day or two.*

*Joan asks, “What is the doctor going to do?”*

*The pharmacist answers, “Evaluate to see if you have a more serious condition and see if you need an antibiotic”.*

*Based on this interaction Joan sets up an appointment with her doctor the following afternoon. She enters the appointment with the expectation that she will need an antibiotic and tells the doctor this. He diagnoses her with sinusitis and gives her a prescription for an antibiotic.*

Because of the patient expectation – which was set up by the pharmacist – the doctor prescribed the antibiotic. As you will see later in this book, she most likely does not have a bacterial sinus infection. If all health care providers are on the same page about when antibiotics are needed then fewer antibiotics will be prescribed.

## **Conclusion**

Antibiotics are associated with many risks. Unfortunately, they are over prescribed in today’s health care setting. Providers not understanding the guidelines are typically not the problem. Health care providers need to educate patients about when antibiotics are not needed and what other strategies may be helpful in treating their condition.

The remainder of the book is set out to educate the reader about common issues seen in health care and help them understand how they should be treated. If you understand treatment options, you are more likely to get better care and be less frustrated by the health care system.

Multiple health conditions will be looked at including: fever, the flu, cough, allergies, sore throats and nasal congestion.



## **Chapter 2: Self-management of Disease**

The remainder of the book will look at the patient's role in managing common health issues. As the title suggests the book will evaluate the common symptoms of cough, congestion and sneezing, it will also look at fever and sore throat. The book will look at many diseases that are associated with these symptoms.

When I was in graduate school, I learned that patients came into the office with symptoms. It was my job to extract the history, perform a physical exam, run targeted tests and give the patient a diagnosis.

For less common diseases, this is typical. For example, the patient with abdominal pain will come in and report that her stomach hurts. Rarely, do patients with pain in their stomach come in and tell me that they are having a bout of appendicitis.

For the more common conditions, patients have been educated about what they are and how they are treated. Unfortunately, many have been educated incorrectly.

The patient with nasal congestion usually comes in and says, "I have a sinus infection and I need an antibiotic". Rarely, does the patient with a stuffy nose come in and tell me that their nose is stuffy and are not sure what is causing it.

It is the job of the next few chapters to look at common symptoms, describe what could be causing the symptoms and how they should be managed.

### **The patient's role**

The patient's role is critical when it comes to common acute health care problems. Running to the doctor every time you get the sniffles is wasteful of your time and your money. On the other hand, if you do not manage the symptoms properly you are at risk for complications.

I suggested four things that patients want when they are sick in the introduction of the book. These included:

- To feel better
- To know what is wrong
- To feel reassured when the doctor tells them what is wrong
- Antibiotics

The goal of this book is to help the reader accomplish these goals without running to the doctor. After reading the book the individual who comes down with a common health problem will be able to:

- Utilize home remedies and the drug store to feel better
- Understand what is wrong
- Feel reassured of what is going on
- Understand when they need antibiotics – which as you will find out, is not most of the time
- Understand when they need to go to the doctor

With the advent of so many different over the counter medications and products, it sometimes feels like you need a PhD in order to figure out how to use a drug store safely.

In order to use a drug store safely you need to take an active role in understanding your health conditions, medication allergies and medications you are on. Over the counter medications and home remedies can very successfully manage many health conditions, but you need to understand them.

Individuals with certain disease states are at higher risk for complications with certain over the counter medications. For example, individuals with high blood pressure are at increased risk to have complications from elevated blood pressure after taking an over the counter decongestant. It is important that if you are afflicted with high blood pressure or any form of cardiovascular disease that you are aware which products may do damage to the body.

You need to understand which medications you are on as there is a potential for interactions with prescription as well as non-prescription medications.

Your role in managing common health care problems, involves your ability to use home remedies and over the counter medications. This book will highlight the use home remedies and over the counter medications in the management of the conditions looked at.

## **Quiz**

The following is series of scenarios that commonly come into the doctor's office. Look at each scenario and consider what you would do.

1. A 30-year-old man comes in to his doctor and reports that he is “as sick as he has ever been”. “Doc, I have a terrible case of bronchitis and I need an antibiotic”. He reports that he had a fever of 101 degrees Fahrenheit, his cough is dry and annoying, he is really tired, has a headache, and his muscles and joints hurts. He also reports that his nose is stuffy and his throat is a little sore.
2. A 23-year-old female comes to her doctor and reports that she feels horrible. “ I have had a fever around 100 degrees Fahrenheit for the last two days, a sore throat, runny nose and congestion. This is just like the last sinus infection I had. I need the z-pack”.
3. An 8-year-old girl comes into the doctor with her mother. The mother reports that she has another ear infection. She has not slept well over the last couple of night, has had a stuffy nose and a fever of about 99 degrees Fahrenheit. The child reports that her ear does not hurt now, but it has bothered her on and off over the last few days.
4. A 20-year-old female comes to her doctor with tonsillitis. “My nose has been stuffy for the last couple of days and I have been coughing. I woke up this morning and my throat hurt really badly. I looked in my throat and my tonsils were swollen and there were white dots on them.”
5. A 14-year-old boy comes into his doctor’s office with a sinus infection. “I have had a cold for the last three days and the snot from my nose was clear; but it has been dark yellow today. I had a fever the first two days, but it has not been present today.”
6. A 38-year-old female enters the urgent care clinic with a really bad cough. “I was up all night coughing.” The patient denies any fever, chills, head congestion or body aches. “This is another bout of bronchitis”.

These scenarios are common problems encountered by the primary care health provider. All information is not available in these scenarios, but an antibiotic could very well be given to any one of these patients. However, each scenario most likely does not require an antibiotic.

The rest of this book will look at scenarios similar to these and discuss when an antibiotic is indicated and when it is not. It will also discuss what else can be done to provide comfort and enhance resolution of the illness.

### **Communicating with the health care provider**

You and your health care provider co-manage disease. When you come down with a condition that makes you ill, you will feel better about the decision to not use antibiotics if you realize there is a back up plan if symptoms do not improve. These plans are developed through good communication.

Patients should be decision-making team members in their own care. When you are a decision-making member of the team, you must be educated. This book will do just that.

Miscommunication is common in the busy health care arena. This is partly the fault of the patient, partly the fault of the health care provider and partly the fault of the system. Well-informed health care consumers, understand that communication is often poor in the system, but proper communication is critical. It is therefore important to have a system in place to improve communication.

You should go into each health care appointment organized and ready. The [acute care visit form](#) provides a system for you to communicate effectively at your health care visit. Before going to your doctor for a health concern, take some time to fill out the acute care visit form.

In addition, take some time to write down some questions on the [question form](#) to help you remember what questions to ask. This is a form for you to record a list of questions you want your health care provider to answer. Report the questions in order of importance. The most important question that you want answered should be number one. Realize that you may not get to all of your questions during the office visit. Make one copy for you and one for your health care provider.

Health care providers do not always know what the patient is thinking. It therefore, falls on the lap of the health care consumer to get all of their questions answered. Going into an appointment with a list of questions is helpful.

Patients who are prepared and organized get better health care and have better health.

Doctors often fail to ask important questions when interviewing a patient. The responsibility to report the necessary information to the doctor is partly the responsibility of each patient. There are three main types of doctor's appointments: acute visits, maintenance evaluations and follow-up appointments. This book looks mainly at the acute visit, which is when there is a medical problem that needs an immediate evaluation.

Maintenance visits, which are meant to help preserve the health of the patient, are visits that do not require urgency and can be set up at the convenience of the doctor and the patient.

Follow-up visits are used when a patient has an intervention performed by a health care provider and the health care provider needs to evaluate the effectiveness of the intervention. For example, when a patient is started on a new allergy medicine the doctor will schedule a follow-up visit to evaluate the effectiveness of the drug or if there are any negative consequences of the drug.

The [acute visit form](#) will help you organize health care information when presenting with a new health care issue. It includes a section to record instructions on treatment and follow-up with the health care provider. This form can be used when you are seen by your primary care doctor for a specific problem such as a cough, sore throat, nasal congestion or fever.

The following is a list of steps to help you fill out the acute visit form.

1. Record the doctor's name, the date and a brief description of the problems.
2. List your specific symptom and any describing factors. See [acute visit describing information](#) for a listing of common symptoms and important describing information that will help your doctor determine the origin of your problem.
3. Bring the form to the doctor appointment and record the diagnosis that the doctor gives to you.
4. Record the names of any medications that the doctor prescribes and ask:  
a) how to take it/how long to take it b) side effects c) any follow up required
5. Record any other treatments ordered

6. Record any testing the doctor wants to perform including radiology or laboratory work.
7. Record what type of follow up is necessary. It is important to specifically ask when you should be seen back in the office, when to call the office and what information you can gather about this problem that will help your evaluation. For example, filling out an allergy chart may be helpful to monitor the effectiveness of the allergy medication.

The quality of the health care appointment is dependent on a good interaction between health care clinician and the patient. The patient's role is to transmit an accurate history of what is going on. The acute visit form will help you prepare for your visit. If you are prepared, the visit will go more smoothly, which will leave more time for questions at the end of the visit.

A lot is going through your mind when you are at the doctor's office and at times it is difficult to remember all the items transmitted at the doctor's office and taking good notes can go a long way in improving health care. The acute visit form will help you remember to ask questions and record the answers to those questions. This will assure you remember all of the information transmitted at the doctor's office.

### **Goals of the book**

This book will try to accomplish a number of goals. Primarily, after reading it I hope that you are better able to care for yourself when you are sick.

One of the major underlying goals is to help the reader understand that antibiotics are over prescribed and they do not need to be used in many illnesses.

This role falls directly on the head of the consumer. Many people would argue that this is the doctor's responsibility, but it is not his responsibility alone. Doctor and patient have a co-responsibility to manage disease.

As a health care consumer you can help the doctor out, by not expecting antibiotics. You may even want to question the need for antibiotics in some instances. Your health, the health of those around you and the health of the health care system as whole will be improved.

Each chapter of this book will end with some questions that will stimulate conversation between patient and health care provider. These questions are meant to improve the quality of health care.

### Chapter 3: Fever

Fever is a common problem suffered by patients. It is not a disease in itself, but a symptom of an underlying problem. With most acute, infectious illnesses, fever typically lasts only a short period of time and goes away on its own.

The body temperature is controlled by a part of the brain called the hypothalamus. While normal body temperature is often quoted as 98.6 degrees Fahrenheit, there can be a normal range of temperatures that vary given the time of day.

Many things cause temperature to vary. Most people have a range of body temperature between 97.5 and 98.9 degrees Fahrenheit. Temperature is usually lowest in the early morning and highest in the late afternoon. After exercise, body temperature is higher.

Whole books have been written about fever and it is a complex topic. Fever can be classified as acute or chronic. Most cases of acute fever are related to some sort of infection and last two to five days. This chapter will look at acute fever.

Chronic fever is a much more complex topic and will not be addressed here. Chronic fever is a fever that lasts beyond three weeks and may indicate a chronic or serious infection, cancer or an autoimmune disease (for example, rheumatoid arthritis or lupus).

Commonly, with fevers, the body shakes in a process called chills. When the body temperature stabilizes at a higher temperature than the normal body temperature, your skin will feel hot. When the fever “breaks” and temperature returns to normal, the body usually sweats as it gets rid of extra heat.

At times a fever is a good thing, it helps the body fight infection. It also lets the patient know something is wrong. At times fever can be dangerous and it is important to know when fever needs to be evaluated by a health care provider.

Fever is often accompanied by a multitude of other symptoms such as a sore throat, stuffy nose, cough or earache. In addition, fever can be the source of a lot of discomfort. Fever can be associated with:

- Body aches
- Headache

- Loss of appetite
- Chills
- Sweating
- Weakness

Individuals who have high fevers may become confused and even have hallucinations. Irritability is another factor that is often associated with fever. One potentially scary consequence of fever is the febrile seizure. The febrile seizure is more common in individual less than 5 years old. It is most common when there is a rapid increase or decrease in body temperature.

### **Measurement of Fever**

How should a fever be monitored? Many patients can tell when they have a fever, but have a difficult time quantifying the degree of the fever. Knowing the degree of fever is important as it can help determine if you need to be evaluated by a health care provider.

Oral, rectal, axillary, tympanic and surface thermometers are all available for the evaluation of body temperature.

Taking the temperature via the oral route is a very common way to measure temperature. Its accuracy is affected by many factors including:

- The placement of the probe. The probe should be placed under the tongue with the probe in the back of the mouth.
- Opening the mouth, which allows air to flow over the probe.
- Mouth breathers or hyperventilation can reduce the accuracy of the temperatures.
- Drinking cold or hot beverages can affect the temperature within five minutes of having the temperature taken.
- Smoking can affect the accuracy of the oral temperatures.

The axillary (in the arm pit) route is not preferred, as it tends to be the least accurate.

Taking the temperature rectally is considered the gold standard, but can be quite unpleasant and at times risky. It takes about five minutes to get an accurate reading. Risks include: damage to the rectal wall and potential infection. The accuracy of the rectal reading can be affected by poor technique

and a stool impaction. A rectal reading is about one degree Fahrenheit higher than an oral reading.

Checking the temperature over the forehead is another common way to measure temperature. This method utilizes the heat coming off the temporal artery, which sits close to the skin on the forehead. This method is rapid and is well tolerated by young children.

Taking the measurement in the ear is a popular way to measure the temperature. This method measures the heat of the eardrum. Errors occur with this method when there is poor technique, excessive earwax, those with small ear canals that are not suitable for the probe and those who have ear infections. Ear thermometers should not be used in those younger than 6 months.

Ear thermometers provide rapid results and are convenient to use. They do have some downsides including: cost, need for batteries and need for frequent calibration.

### **When to visit the health care system**

More than just looking at the body temperature, it is important to consider the whole patient when evaluating the individual with fever. Some things to notice are: Is the child irritable, crying, complaining of pain, excessively sleepy, coughing, complaining or any congestion or any other unusual symptoms.

The child who has a fever of 102 degrees Fahrenheit and is playing and eating well and demonstrates no irritability is likely not that sick. The child with a fever of 101 degrees Fahrenheit who is extremely sleepy is more likely to be very sick.

Life-threatening infections are rare, but should be considered anytime there is a fever. Meningitis (infection in the central nervous system), peritonsillar abscess (severe infection in the throat), peritonitis (infection in the stomach) and a variety of other conditions may be potentially life threatening. How do you know if you may have one of these conditions? Certain symptoms, when accompanied by a fever, should be evaluated by a health care provider as soon as possible (see red flags).

### **Red Flags**

Red flags are situations that require urgent and sometimes emergent medical care. Red flags for fever vary depending on age. The list is long, but most red flags are not common.

- Stiff neck
- Abdominal pain
- Persistent vomiting
- Extreme sleepiness
- Excessive crying or fussiness in a child
- Severe headache
- Sensitivity to bright light
- Shortness of breath
- Chest pain
- Difficulty swallowing/drooling/severe sore throat
- Severe heart or lung disease such as severe emphysema or heart failure (usually in adults).
- Confusion
- Immune system dysfunction (for example, those with cancer or AIDS)
- Anyone with head trauma
- Newborns who have a temperature less than 97 degrees Fahrenheit
- A child with a purple rash
- Children with a history of febrile seizures
- Risk for hyperthermia (someone who has participated in extreme exercise or who has been left in a hot environment such as a car)
- Any fever over 105 degrees Fahrenheit, fever above 106 degrees Fahrenheit often occurs with bleeding into the brain
- Anyone under 6 months-old who has a rectal temperature equal to or greater than 100.4 degrees Fahrenheit
- Anyone under 2 years-old who has a rectal temperature greater than or equal to 103 degrees Fahrenheit
- An adult or older child with a persistent fever above 103 degrees Fahrenheit
- Fever that persists beyond five days

- Individuals who cannot describe the symptoms need evaluation (young child or older adult with confusion)

## **Treatments**

When it comes to treatment of fever a few questions need to be addressed. First, should fever be treated? Second, how should fever be treated?

Many people think that fever is there for a reason and suppressing the fever reduces the body's ability to fight the infection or what ever is causing the fever. Increased body temperature is able to kill or reduce the growth of some germs that cause disease.

Fever does not have to be treated if it is low grade and the individual is not uncomfortable. Many experts believe a fever should not be treated if it is below 102 degrees Fahrenheit. A temperature above 102 degrees Fahrenheit should be treated. If the individual is miserable – even if the fever is low grade - the fever should be treated. Treating the fever is one of the simplest measures to improve comfort.

The use of non-drug treatments is appropriate for most cases of fever. Assure that there is adequate fluid intake. Fevers can increase the risk of dehydration, which needs to be guarded against. Plain water is the best replacement of the adult. Younger children may benefit from an oral hydration solution such as Pedialyte. Fluid should be increased by about one ounce in the child per hour and 2-3 ounces per hour in the adult with fever.

Wear light clothes. Do not dress in layers or bundle up under blankets.

Sponging may help reduce body temperature in mild fever but when the temperature is above 104 degrees Fahrenheit it should not be used as there may be shivering. Shivering is dangerous in the child with a high fever because this may increase body temperature further.

## **Medications**

Fever that creeps above 102 degrees Fahrenheit should probably be treated. The three most common medications used in the treatment of fever are:

- Aspirin
- Acetaminophen
- Non-Steroidal Anti-Inflammatory Medications (NSAIDS)

Aspirin is a pain reliever as well as a medication that will help bring down fever. It may upset the digestive tract in some people and has been linked to ulcers. One advantage is that it is inexpensive. Aspirin is not recommended in those who are under 18 as there is a risk of a rare neurological disease called Reye's syndrome.

While children should not use aspirin or naproxen sodium (Aleve) they can use both acetaminophen and ibuprofen. The dose of acetaminophen and ibuprofen is based on weight – see [table](#).

Acetaminophen, known under the brand name Tylenol, is a common medication to treat both pain and fever. When used for short periods of time it is a very safe drug. It lacks major drug interactions.

One draw back with this medication is that it lacks anti-inflammatory effects. This means that when there is inflammation, which often contributes to certain types of pain, acetaminophen may not be the best option.

It is toxic in high doses and should be minimized to less than 4 grams a day in the adult. If you follow the labeling on the bottle, you will not overdose. In overdose, acetaminophen has its toxic effect on the liver. Combining acetaminophen and alcohol is not recommended.

Acetaminophen will provide relieve for 4-8 hours depending on which formulation is taken.

Non-Steroidal Anti-inflammatory (NSAIDS) medications are another group of medication that are commonly used in the treatment of pain and fever. Like acetaminophen, it is safe when used for a short period of time. NSAIDS have more side effects and needs to be used cautiously in certain groups of people, especially when used for extended periods of time. People at risk included those with kidney disease, heart disease, heart failure, high blood pressure and stomach ulcers.

NSAIDS have more side effects than other medications. They should not be used in combination with alcohol. In addition, their regular use may [interact](#) with some blood pressure medications.

Naproxen sodium is another pain/fever reducer that is classified as a NSAID. It is not indicated for the child less than 12 years old and has similar side effects as ibuprofen.

**What to do?**

1. If you suspect a fever, you should quantify the fever by measuring the body temperature.
2. Are there any red flags? If yes, contact your health care provider.
3. Take inventory of your symptoms to help determine the possible cause of your fever (Table 2). Refer to other sections on those other symptoms
4. If temperature is above 102 degrees Fahrenheit use drug and non-drug methods to reduce fever.

*Table 2: Possible cause of fever*

| Condition                          | Some possible symptoms   |
|------------------------------------|--|
| Bronchitis                         | Deep cough   |
| Common cold                        | Sore throat, cough, runny or stuffy nose                                 |
| Ear infection                      | Ear pain, recent cold or history of allergies                            |
| Influenza                          | Non-productive cough, body aches, feeling run down                       |
| Pneumonia                          | Cough, shortness of breath   |
| Throat infection                   | Sore throat  |
| Upper respiratory tract infections | Cough, nasal congestion, runny nose                                      |
| Urinary tract infection            | Frequent urination, burning upon urination, the need to urinate urgently |

## Chapter 4: Influenza

*A 30-year-old man comes in to his doctor's office and reports that he is "as sick as he has ever been". "Doc, I have a terrible case of bronchitis and I need an antibiotic". He reports that he had a fever of 101 degrees Fahrenheit, his cough is dry and annoying, he is really tired, has a headache, and his muscles and joints hurts. He also reports that his nose is stuffy and his throat is a little sore.*

One common infectious disease that causes fever is influenza. Flu is most likely described in the case above. If you recall the case above was first presented in chapter 2. As I indicated, there is a good chance that this patient would get an antibiotic if he presented to the health care system.

The flu is a viral infection that is associated with many negative effects. Individuals affected by the flu are sick - often unable to get out of bed for a couple days. It is associated with high fever, extreme fatigue, cough and a myriad of other symptoms.

The flu, also known as influenza, is responsible for 41, 000 deaths every year in the United States. It is a very common disease as it affects 5-20% of the population annually<sup>6</sup>.

Influenza is a viral illness that is preventable with vaccination. The Center for Disease Control (CDC) recommends that many groups of people get vaccinated. Unfortunately, there is significant under vaccination every year.

Influenza is broken down into two major classes: type A or type B. Testing done by health care providers can differentiate between the two types of influenza, but it is impossible to distinguish based on the symptoms.

In some people it is important to differentiate between the types of influenza, as different medications are more effective for the different types. It is also helpful for scientists to know what strain is causing the illness, to allow better overall management of the disease and better vaccination development.

Influenza is further subdivided based on antigens that inhabit the surface of the virus. It requires more intensive testing to make this further subdivision, but it also may be important in terms of treatment. The two surface antigens that are responsible for sub-typing influenza A are called hemagglutinin (H) and

neuraminidase (N). Based on the numbers of surface antigens present, type A influenza is broken down into subgroups like H1N1 or H5N1.

The virus changes slightly from year to year. Consequently, the vaccination composition needs to change every year. A potential exists for the virus to dramatically change resulting in a strain of the virus that not only the vaccination will not recognize, but also the human immune system will not recognize. This could potentially result in a high mortality rate from influenza.

Influenza is transmitted by respiratory secretion. Common ways it passes from person to person include:

- Droplets of the virus are expelled when an infected person coughs or sneezes
- Someone touches a surface that is infected with the virus, then the person touches his mouth or nose and the virus enters into the respiratory system
- When a non-infected person shakes hands with someone who has the virus on his or her hand and then the non-infected person touches his or her mouth or nose the virus is transmitted into the respiratory system

### **Key points about influenza**

- The disease lives in the patient for 1-4 days before the patient gets sick.
- The patient is most likely to pass on the infection 24 hours before the patient feels sick to when the symptoms are the worst.
- Most people are infectious for about 5-10 days after the onset symptoms.
- Some individuals with diseases of the immune system may be contagious for months after the infection.

### **How it presents**

- Abrupt onset – the patient goes from feeling OK to very poorly in a short period of time.
- High fever is common, usually about 101-102 degrees Fahrenheit but may be as high as 104 degrees. Fever usually lasts 2 to 5 days, but may last up to a week.
- Non-productive cough
- Muscle aches
- Joints ache

- Feeling wiped out
- Sore throat
- Headache
- Runny or stuffy nose
- Eyes may be red or burn
- Children are more likely to have nausea or vomiting
- Older adults may present with mental status changes such as confusion

The person affected with influenza will feel the worst the first 3-4 days and then will notice a slow improvement. The person may have cough, weakness and just not feeling like themselves for up to 14 days after the onset of the infection.

The person with influenza will look tired; have flushed cheeks and hot skin.

### **Other causes of flu like symptoms**

Influenza has the hallmark symptoms of an abrupt onset with fever and non-productive cough, but other illness need to be considered when these symptoms are present. Other disease to consider include:

- Other viral respiratory infections
- The common cold – {(see chart) usually starts with nasal congestion, runny nose, sneezing and sore throat}
- Strep throat {usually presents with sore throat, no cough, fever, weakness, pus on the tonsils and swollen lymph nodes in the neck}
- Pneumonia
- Bronchitis
- Lyme disease

### **Red flags**

Certain symptoms warrant concern. The following is a list of items that warrant immediate evaluation by a health care provider.

- Chest pain with breathing
- Shortness of breath
- Swelling of the legs
- Confusion
- Persistent fever

- Severe headache, stiff neck or extreme sensitivity to light

## **Testing**

Most of the time the diagnosis can be made after the doctor evaluates symptoms and does a physical exam. Testing can be used to confirm a diagnosis if the diagnosis is not certain.

Recently, there has been resistance of commonly used antiviral medications that are used to treat influenza. Consequently, patients may require testing to determine which strain of influenza is causing the illness so it can be treated appropriately.

Multiple methods are available to test for influenza. One of the most common methods is the use of a rapid test that is done in the office. It involves the doctor taking a long q-tip and obtaining a sample of nasal mucus. In other words, the health care provider sticks a q-tip up your nose and gets some snot. This is quite an unpleasant experience. This mucus is then tested for the influenza virus. Tests reveal results in 10-30 minutes.

This test also has the advantage of determining if influenza type A or type B is present. This is helpful in determining which antiviral medication will be most effective. It does not further determine which type of influenza A is present. This may reduce the health care providers ability to determine which medication is most appropriate.

Other tests are available to determine if the flu is present. Viral cultures are the best test, but it takes 1-10 days to get results, which is not ideal. As will be discussed in the treatment section, antiviral medications need to be started as soon as possible for them to be effective in treating the flu. The viral culture also has the advantage of picking up the diagnosis if another virus is causing the infection.

Rarely is blood work required in the management of influenza. It is warranted when the health care provider is considering a complication or an alternative diagnosis.

Pneumonia is a complication of influenza. It is also a diagnosis that may appear similarly to influenza. Health care providers may do a chest x-ray and/or draw blood to help differentiate between these two diagnoses. Lumbar

punctures are sometimes done if the health care provider is concerned about meningitis (severe headache, stiff neck or extreme sensitivity to light).

### **Complications**

Secondary bacterial infections are a worrisome complications. Concern over secondary bacterial infections from influenza is a major reason behind the age expansion on the recommendations for influenza vaccination. The 2008-9 influenza vaccination recommendation has expanded to include all children under the age of 19.

*Staphylococcus aureus* (*S. aureus*) was found to co-infect many of the children who had died from influenza – some cases were caused by methicillin-resistant *S. aureus* (MRSA).

Complications are more problematic in young children and older adults. Those with chronic medical problems are also at high risk for complications. Below is a listing of common complications from influenza.

- Febrile seizures can occur in young children as high fever is a predominate symptom in flu.
- Pneumonia is a serious complication of influenza. It should be suspected in those who are getting worse with influenza with symptoms such as worsening cough, persistent fever, bluish discoloration around the lips or of the fingertips or shortness of breath. A chest x-ray should be attained in anyone with these symptoms.
- Those with chronic lung disease are at risk for respiratory failure after influenza.
- Dehydration
- Worsening of underlying heart disease
- Bronchitis
- Ear infections
- Inflammation of the heart or heart failure
- Muscle break down - rhabdomyolysis
- Older adults are at greater risk from pneumonia after coming down with influenza; this finding persists even if they got vaccinated<sup>7</sup>.

### **Prevention**

Prevention is critical, especially in those at high risk. The number one way to prevent influenza is through annual vaccination. Vaccination is not perfect. It does not prevent every case of influenza and the shot may have some minor side effects, but it may be life saving. The vaccine prevents influenza in 70-90% of people when there is a good match between the virus that is circulating and the virus that is in the vaccine. Unfortunately, when there is a bad match it is between 0 and 50% effective<sup>6</sup>.

Influenza vaccine is very helpful in those with heart disease. It decreases cardiac events in those with established heart disease<sup>8</sup>. Vaccination significantly reduces the risk of death from cardiac causes.

The Center for Disease Control is the organization that develops the recommendations for influenza vaccination that most health care providers go by. The current recommendations include the following people get vaccinated<sup>6</sup>:

- Everyone over 50-years-old
- Everyone under 19-years-old (except those under 6 months)
- Those with chronic diseases such as chronic lung disease, asthma, heart disease, kidney disease, diabetes, anemia, an immunocompromised state such as cancer or HIV, and muscle or nerve disorders
- Nursing home residents
- Pregnant women
- People who live in crowded conditions
- Health care workers

Some individuals are not candidates of the influenza vaccination. The following are a list of people who should not get the vaccination.

- Severe allergy to chicken eggs
- Severe previous reaction to the influenza vaccination
- Those with a moderate to severe illness with fever should delay vaccination until feeling better
- History of Guillain-Barre syndrome within 6 weeks of getting an influenza vaccine
- Those less than 6 months old

The vaccination should be received every year in October or November. Influenza season may start in November, but usually does not get ramped up until January. It does take two weeks for the vaccination to take effect. It is reasonable to give the vaccination later than November if it has not been received yet. The vaccine will protect throughout the flu season.

### **How to get vaccinated**

Two methods exist for vaccination: injection and nasal spray. The injection is the more common method for vaccination. Some vaccinations are indicated for all ages while some are indicated for certain groups of people.

Most individuals need just one vaccination, but some need two. Children less than 9, who were vaccinated for the first time or who were vaccinated with only one dose in the 2007-2008 influenza season should get 2 doses (4 weeks apart) of the 2008-2009 influenza vaccine (as of this printing the guidelines for the 2009-10 influenza season have not been released). This applies to the injection and the nasal spray.

Injection is associated with some minor side effects. Soreness, redness or swelling at the injection site can occur. It usually starts about 12 hours after the shot and may last for 1-2 days. Some patients have a low-grade fever or generalized muscle aches, but this is less common than the local reactions.

The nasal spray is also linked to some side effects including: runny nose, headache, sore throat, cough, muscle aches and wheezing.

The nasal spray – FluMist – is not indicated for all people. It should be used only by those between the ages of 2 and 49 and should not be given to pregnant women or those who are at risk for complications from influenza. In adults the injection is more effective than the nasal vaccination<sup>9</sup>. Although the nasal vaccination may be more effective in children<sup>10</sup>.

Other methods to prevent influenza include:

- When coughing and sneezing cover the mouth and nose
- Avoid contact with sick people
- Dispose of tissues that are soiled
- Wash hands regularly, carry a bottle of alcohol based hand-sanitizer and use frequently

- Avoid touching the nose, mouth or eyes.

Medications used in the treatment of influenza can also be used in the prevention of the illness in those who have been exposed to influenza. They are helpful when taken within 48 hours of exposure and are 70-90% effective at preventing influenza<sup>6</sup>. These medications should be taken for 10 days but longer treatment is needed in select situations.

### **Treatment**

Treatment must be started soon when influenza is present. To be effective the medication needs to be started within 48 hours, but there is evidence to suggest that quicker treatment is even more beneficial.

Not everyone with influenza has to be treated, but certain groups of people should be treated. Those at high risk of a poor outcome or complications should be strongly considered.

Four medications are currently available in the treatment of influenza. As of the 2008-9 influenza season there is significant resistance noted to 3 of the 4 antiviral medications used to treat influenza.

The four medications for influenza are: Oseltamivir (Tamiflu), zanamivir (Relenza), amantadine (Symmetrel) and rimantadine (Flumadine). Resistance was noted to both amantadine and rimantadine since 2006, but as of 2008 there was significant resistance also noted to oseltamivir. Because of the increased resistance, zanamivir is now being used frequently in the treatment of influenza.

The benefit of antiviral medication is not overwhelming. If the medication is given within 48 hours of the onset of symptoms, the length of illness is reduced by one day<sup>11</sup>. In addition, medications reduce the amount virus that is shed. Antiviral medications also reduce the risk of complications and death and are therefore more important to utilize in those at high risk.

High risk patients also may have a better response to antiviral medications. One study showed that the symptoms were reduced by 2.5 days in high risk individuals, but only 1.5 days in those who are normal risk<sup>12</sup>. Another study showed that the severity of illness is also reduced. The severity was reduced by 40% in those who took the antiviral oseltamivir<sup>13</sup>.

*Table 3: Flu Medications*

| Medication               | Dose   | Use   | Side effects  |
|--------------------------|--|---|---|
| Zanamivir<br>(Relenza)   | One puff taken twice a day for five days. Treatment is for those older than 6 years old; and for prophylaxis in those 5 and older. | Influenza A and B. Should not be used by those with lung disease                        | Diarrhea; nausea; sinusitis; nasal signs and symptoms; bronchitis; cough; headache; dizziness; and ear, nose, and throat infections |
| Oseltamivir<br>(Tamiflu) | Children over one – dose based on weight. Adults 75 mg twice a day for five days.  | For influenza type A (but not for certain strains) and influenza type B. Take with food | Nausea and vomiting, confusion and abnormal behavior  |

Going into the 2009-10 year many questions remain. Will the strain be more more virulent? Will the vaccine match be as good? Will resistance increase? Will there be another outbreak of swine flu? It is therefore important that assure you take good prevenative measures against the flu.

### **Treating symptoms**

Influenza makes people feel terrible. A large part of treating the flu is treating the symptoms. There are many interventions and medicaitons to help the patient feel better.

- Rest
- Maintaining hydration
- Providing humidification
- Treatment of fever, body and joint aches with medications to treat fever and pain
- Cough suppression

Non-drug treatments can go along way to promote comfort. Rest will help the body recover from the illness. Rest is usually a built in side effect of the flu.

People who are afflicted with the flu are too ill to do anything other than rest for a few days.

Influenza is associated with fever. Fever increases the body's need for water. It is therefore important to increase fluid intake in the face of fever. Adults should focus on increasing plain water, but any non-alcoholic or non-caffeinated beverage will do. Infants should increase intake of breast milk or formula or an electrolyte replacement beverage such as Pedialyte.

Humidification is helpful in loosening congestion. A cool-mist humidifier is very helpful to run at night. When nasal congestion is prominent, the use of steam showers can help open nasal passages.

Ibuprofen or acetaminophen are two primary medications used to manage pain and fever. Aspirin is sometimes taken, but should not be used in those with a viral illness. Aspirin is especially dangerous in children as it increases the risk of Reye's syndrome. This syndrome can also occur in adults but is rare.

As a general rule do not give aspirin to anyone under 19 years old.

Cough in influenza is often dry. In addition to increasing hydration and using humidification, the use of medications to help loosen cough and get rid of mucus may help.

- Guaifenesin (Mucinex) can be helpful (see Table 8 on page 121).

When cough interferes with sleep or is causing extreme discomfort the use of cough suppressants may be indicated. Reducing cough can be accomplished with multiple medications.

- Dextromethorphan (Robitussin) or Dextromethorphan polistirex (Delsym) has few negative effects but some individuals will have nausea, vomiting, constipation and some may experience drowsiness.
- Benzonatate (Tessalon Perles), a prescription medication, can be taken 3 times a day.
- Codeine solutions suppress cough but are a narcotic medication that are associated with nausea, vomiting, constipation, sedation, dizziness and falls. Some people may also get addicted to the medication. High doses are associated with reduced breathing.

## **Summary**

Influenza is a contagious respiratory illness that is associated with patients feeling terrible. It can even lead to death. Managing symptoms will help improve comfort. The use of ibuprofen or acetaminophen is helpful in the management of the most bothersome symptoms. Influenza has an abrupt onset of fever, chills, malaise, cough and sore throat. Antiviral medications are used in the treatment of some patients with influenza, but are not a magic bullet. Vaccination is the best method to reduce the risk of the disease.

### **Questions to ask your health care provider about the flu**

#### *Before getting the flu*

1. Am I at high risk for the flu?
2. Should I get the flu shot? When should I get the shot?

#### *If you think you have the flu or your doctor tells you have the flu*

3. Do I have the flu or another illness?
4. Do I need a test to tell if I have the flu?
5. Is there a medication that will help the flu?
6. Is there a medication that will help alleviate my symptoms?
7. How effective is the medication you are recommending?
8. What are the side effects of this medication?
9. Does the medication interact with any of my other medications?
10. What complications should I look out for and what symptoms will manifest?

## Chapter 5: Head Congestion

*A 23-year-old female comes to her doctor and reports that she feels horrible. "I have had a fever around 100 degrees Fahrenheit for the last two days, a sore throat, runny nose and congestion. This is just like the last sinus infection I had. I need the z-pack".*

Pounding head, fullness, pressure and inability to concentrate are all complaints the patient with head congestion might be feeling. Head congestion can be caused by a variety of conditions and lead to a variety of complications.

"Yes, I know your face hurts and you are miserable, but you have a cold. An antibiotic will not make your face feel better."

Your body is the best "antibiotic" there is. The healthy human is able to fight off infection. I have the above conversation with a patient at least once a day during cold and flu season.

Patients often persist, "I know my body and this will not go away on its own".

It will. It sometimes takes a little bit of time, but antibiotics do NOT speed that process along. This is not how antibiotics work.

The common cold is a common cause of head congestion. The common cold is a virus and antibiotics do NOT treat a common cold. Over 200 different viruses can cause the common cold and because of the variety of germs that may cause the condition, it can present in a variety of ways.

Rhinovirus is one of the most common viruses that cause the common cold and it typically presents with a sore throat, nasal congestion, low-grade fever and cough. The fever typically resolves within two to three days. Nasal discharge often accompanies a cold and is clear and thin, but often becomes thick and turns yellow or green after a few days.

Many people think that thick discolored mucus indicates a bacterial infection and an antibiotic is needed. It is common to have thick off-colored nasal discharge for a few days, but it should revert back to clear discharge or the discharge should stop by day 5-7. Nasal congestion and cough may continue for 2 weeks after the onset of a cough.

### **Risk Factors for the Common Cold**

- Daycare attendance

- Young age. The young child has an immature immune system. It is not that unusual for young children to have 12 colds a year.
- Day care attendance
- Old age. Older adults have a decreased cough and gag reflex and an immune system that does not work as well.
- Certain disease states such as cancer, HIV and diabetes
- Conditions that require you to be on medications that suppress the immune system such as prednisone
- Travel on buses, planes or in crowded conditions
- Psychological stress
- Excessive exercise
- Low vitamin D level
- Winter season. Viruses survive better in low humidity environments.

### **What to Expect**

Understanding the natural course of the common cold is essential. The common cold can make you feel terrible – it can lead to tremendous head pressure and a significant reduction in productivity. Even though it makes you feel bad antibiotics do not help the common cold.

The common cold is sometimes followed by complications that may require antibiotics. Everyone should understand the common path of the common cold and know when an antibiotic will be helpful.

Ear infections – also known as acute otitis media – sometimes follow a cold and sometimes need to be treated with antibiotics. It is important to note that most ear infections do not need to be treated with antibiotics. This will be discussed further in a later section.

**Red Flags** – situations that require urgent interventions

- Bluish color of the skin
- Inability to drink enough fluid
- Fever above 104 degrees Fahrenheit for greater than 3 days
- Breathing difficulty including wheezing, fast breathing or labored breathing
- Seizure, lethargy or extreme irritability

Other reasons to call your health care provider:

- Symptoms that persist beyond 10 days
- Ear pain or discharge from the ear
- Symptoms that include a moist cough that is not responsive to treatment

### **Other Considerations**

Sinus infection is another common cause of head congestion and it can be helped with antibiotic treatment. Unfortunately, the diagnosis of sinusitis is made far too often. Common colds are often predecessors to sinus infections. Only 2% of common colds go on to sinus infections<sup>14</sup>. Sinus infections will be discussed in a later section, but they are associated with fever and thick nasal discharge, facial discomfort that is made worse by bending forward, persistent headache and a poor response to decongestants *that last longer than 10 to 14 days*.

Allergies are another common cause of head congestion and will be discussed more in a later chapter. Allergies are characterized by persistent sneezing; itchy eyes, nose and throat; nasal obstruction and congestion; and thin, clear, runny nasal discharge.

Antibiotics do not help a common cold, unless there is a complication such as an ear infection or a sinus infection.

How do you differentiate the common cold from sinusitis from allergies from the flu? Sometimes this is difficult and requires evaluation from a qualified health care provider, but sometimes it is easy. The [symptom chart](#) provided looks at these four common conditions that lead to nasal congestion. The chart looks at other factors that will help you determine the cause of the nasal congestion.

### **The Patient's Role**

People think they need antibiotics because:

1. Symptoms last longer than they think they should
2. Past experience has dictated to them that an antibiotic clears their infection
3. They want their symptoms to get better faster
4. Their symptoms are severe
5. They have an important event coming up and believe an antibiotic will make them better for this event

Treatment is important in a common cold, but it needs to be the right treatment. The doctor's first job in treating a patient is to educate. As a patient you need to understand a few key points.

1. Thick, opaque, yellow and/or green discharge often comes along with the common cold. If the symptoms persist without getting any better beyond 10-14 days than a bacterial sinus infection is more likely (which requires an antibiotic).
2. Symptoms of a cold can last up to 14 days. The average cold has symptoms that last 7-11 days<sup>14</sup>.

It is important to understand the time line in the common cold. Four to five days of a stuffy nose is not an indication for an antibiotic.

An antibiotic will not make you better faster if you have a cold. Antibiotics do not make you better if you have a cold and your symptoms are severe. I know it seems like I am repeating myself, but it is an important point.

The next time you get a cold, think about these guidelines. Do you have a cold? An antibiotic will not help. It is your job to understand this. Do not go into a doctor's appointment self-diagnosing yourself with a sinus infection and thinking you need an antibiotic or asking for an antibiotic.

### **Treatment**

Treatment needs to focus on improving symptoms. People with a common cold can be quite miserable. Getting rest and plenty of fluids should be encouraged to allow the body to heal. Fluids will help prevent dehydration and may help thin the mucus.

Nasal saline is a product that helps clear mucus out of the nose. Sore throat can be treated with oral pain relievers, salt-water gargles or a variety of over the counter throat products (Table 4). No product is a magic bullet, but many can provide some relief of throat discomfort.

Most colds follow a three to five day pattern. While the individual feels quite bad the first few days, by day three there should be significant improvement and by day five the patient should be almost completely well. Nasal congestion and cough is not unusual beyond five days, but the patient should be feeling better than the first three days.

*Table 4: Sore throat medications*

**Chloraseptic spray** contains phenol 1.4% which is an oral anesthetic/analgesic. It can be used for those 3-years-old and older. It is to be sprayed and held in the throat for 15 seconds and then spit out. It can be used up to every 2 hours.

Five sprays for those over 12-years-old and three sprays for those 3-12-years-old.

**Chloraseptic max** combines Phenol 1.5% and glycerin 33 %, which is a demulcent.

**Halls Breezers** contain 7 mg of pectin, which is an oral demulcent. They are meant for adults and children 5-years-old and older.

**Sucrets** contain dyclonine hydrochloride 2.0 mg, which is an oral anesthetic. It is indicated for those 6-years-old and older and can be repeated every 2 hours, no more than 10 per day.

**Cepacol** contains benzocaine 15 mg (oral anesthetic) plus menthol 3.6 mg oral analgesic. Can be given to those 5-years-old and older and repeated every 2 hours.

**Cepacol** (sore throat and cough) has 7.5 mg of benzocaine and 5.0 mg of dextromethorphan hydrobromide (cough suppressant). Individuals over 12-years-old should take 2 lozenges every 4 hours (max 12 lozenges in 24 hours); individuals 6-12-years-old should take one every four hours (max 6 lozenges in 24 hours). It should not be used in those under 6-years-old.

**Cepacol** (sore throat and coating relief) combines a benzocaine 15 mg and pectin 5.0 mg and can be used every 2 hours in those over the age of 5-years-old.

**Tylenol cough and sore throat** combines an oral liquid that contains acetaminophen (Tylenol) and Dextromethorphan. Nothing in the medication directly works on the throat, but acetaminophen is a general pain reliever that will provide some relief and the liquid may provide a temporary rush of relief.

The most important part of treating a cold is to provide the person with rest and fluids. During the first two to three days of the cold those afflicted should take as much rest as possible. The child should be given extra attention during this time. Fluids will help with hydration, soothe a raw and irritated throat and will help loosen congestion.

Cool mist humidifiers and steam from showers can help with congestion. Caution should be used in those who have asthma as those with asthma risk a spasm to the breathing tubes with a change in humidity.

Encouraging children to sleep on their sides may provide more restful sleep instead of sleeping on the back. Sleeping on the back increases the amount of mucus that drips into the throat and chest, which will predispose to coughing and a sore throat.

A multitude of over the counter medications can be used to provide relief while the body fights off the infection. Depending on the primary symptoms that are giving you trouble, you may want to select an agent that will help treat that symptoms. See accompanied [chart](#).

Medicines that bring down fever are also effective at improving pain and body aches. If these symptoms are bothersome the use of acetaminophen, aspirin or NSAIDS can be helpful ([see chart](#)).

[Antihistamines](#) are helpful if you are bothered by runny nose, sneezing and itchy eyes, nose and throat. The first generation antihistamines are more effective at controlling these symptoms than the second-generation antihistamines. Side effects of the antihistamines may be more bothersome than the benefits are beneficial, so antihistamines should be used with caution.

First generation antihistamines include medications such as Diphenhydramine (Benadryl). Second generation antihistamines include medications such as loratadine (Claritin) and cetirizine (Zyrtec).

[Decongestants](#) – either topical or oral – can help with nasal congestion. Adults benefit for up to five days with the use of decongestants to a modest extent but children younger than 12 have not seen the same benefit as adults<sup>15</sup>.

There are three levels of nasal decongestants.

1. Oral medications
2. Topical medications
3. Vapor medications

Oral medications are pills taken by mouth. Examples include pseudoephedrine (Sudafed) and phenylephrine (Sudafed PE). These medications work by constriction blood vessels in the nose. One unfortunate

side effect is that they constrict vessels not only in the nose but also all over the body. Therefore, they can increase blood pressure and should be used by caution in anyone with heart disease, high blood pressure, any other cardiovascular condition in addition to diabetes, thyroid problems, or prostate problems.

Topical decongestants can also be used to unblock the nose. These are medications that are sprayed directly up the nose and act locally. Unfortunately, some of the medication can leak into the blood and act systemically. This means that topical medications can also increase blood pressure. Therefore, the same risks associated with oral decongestants apply to the topical decongestants.

The other major complication of topical decongestants is rebound congestion. The use of topical decongestants for more than three to five days can lead to congestion that becomes difficult to break up without persistent use of the same topical decongestants. Therefore, only use topical decongestants for three days.

Vapor decongestants are not as potent as the other two brands of decongestants, but are the safest medications to use in those with heart disease.

Antitussives (such as over the counter Robitussin - DM) can be used to quiet cough, but in the common cold the best strategy to reduce cough is the use of antihistamines and decongestants.

Antihistamines and decongestants work to reduce the main symptoms of the common cold. They reduce nasal secretions and congestion. When these symptoms are reduced there will be less mucous dripping into the throat – which is the main cause of cough in the common cold.

Antibiotics should not be used for the common cold, unfortunately they often are. Antibiotics – while they may appease the person who goes to the doctor for the cold – do not enhance illness resolution. Upper respiratory tract infections are the second most common reason antibiotics are prescribed each year<sup>16</sup>.

Another common misconception is that antibiotics will prevent a cold from becoming a sinus infection. This is not true.

The main diagnostic challenge for the clinician is differentiating the common cold from sinus infections, which is typically not a concern if symptoms last less

than 10 to 14 days. The diagnostic criteria will be addressed more completely in the section on sinus infections.

Patient teaching should include having the patient follow up with the health care provider if cold symptoms last more than 10 -14 days or resolve then reoccur, temperature is above 102<sup>0</sup> F, the patient develops severe pain in the face or forehead, ear pain or drainage from the ear, shortness of breath, wheezing, or cough that does not improve or worsens.

### **Alternative Treatments**

Some alternative medications may provide aid in the treatment or prevention of the common cold. Echinacea may reduce the duration of the common cold as it may stimulate white blood cells. The composition of different products that contain Echinacea vary greatly, so benefit may not be appreciated with all products. One meta-analysis showed that Echinacea reduced the chances of getting a cold by 58% and decreased the duration of a cold by 1.4 days<sup>17</sup>.

It is important to note that there can be variation in different products containing alternative medications. There is less regulatory oversight with the alternative products and one product that claims to have a herb in it may have a different concentration or amount than another product. Therefore, there can be great variation in the amount of active ingredient in different products. This has led to challenges in attempting to study the efficacy of these products.

Zinc may decrease the duration of the common cold. When combining data there is no convincing evidence that zinc lozenges are helpful in reducing the duration of a cold<sup>18</sup>. Zinc may be difficult for children to take due to side effects such as upset stomach and altered taste. The nasal preparation can affect the ability to smell.

Vitamin C has minimal effect on the common cold. The use of high doses of vitamin C does not prevent the common cold, but some patients may benefit from vitamin C. Individuals who participate in extreme exercise or are exposed to extreme cold may benefit from vitamin prophylaxis<sup>19</sup>.

Caution should be exercised with alternative treatments as there is little regulatory oversight and not a lot of research on drug interactions. Variation in

response can occur with different medications based on the other diseases present in the individual, other medications taken and individual physiology.

### **How can you prevent a cold?**

1. Get a flu shot – there is evidence that the flu shot not only prevents the flu, but may decrease the risk of getting a virus that is similar to the flu.
2. Wash your hands. Probably the most important thing you can do. During cold and flu season try to wash your hands multiple times a day. If you are out in public, carry a small alcohol based cleanser and use it regularly.
3. Use a tissue when you cough and do not cough into your hands. If you do not have a tissue, cough or sneeze into your arm.
4. Stay away from sick people. Sick people populate health care settings.
5. Exercise and eat well. A fit, healthy, well-nourished body is much less likely to get sick.
6. Drink water or other beverages without alcohol or caffeine.
7. Stop smoking. Smoke dries the respiratory tract and destroys the hair like projections that help the body get rid of germs.
8. Sleep well. Lack of sleep increases the risk of developing a cold and reduces the ability of the body to recovery from colds.
9. Use a virus killing disinfectant and disinfect items commonly touched. Viruses can survive on surfaces for hours.
10. Use nasal saline regularly. This is especially important in the winter or in low humidity environments. Dry environments allow viruses to live longer. This includes the inside of the nose. Nasal saline will increase moistness inside the nose and reduce the risk of viruses adhering to the nasal passages.

### **Questions to Ask Your Health Care Provider**

1. Are my symptoms related to a virus or a bacterium?
2. Which medications do you recommend to manage my symptoms?
3. Are there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
4. When should I suspect an improvement in my condition?

5. What complications should I look out for and how will they show up?

### Cold Kit

The cold kit is something that you should have on hand at home. It is similar to a first aid kit. It is a little box with supplies and medicines to help relieve the symptoms of a cold. I highly recommend that you get a box and keep these products in the box at home.

Over the counter medications are very effective in the healthy individual over the age of 12. Over the counter medications are associated with some risk and lack of benefit in some individuals. There is risk in older adults with multiple medical problems. In addition, there is risk with younger children. If you fall in one of these groups make sure you pay particular attention to the risks associated with any medication that you take.

In addition, there is not only risk but also lack of effectiveness for many over the counter medications in children. If you are a parent (as I am), you hate to see your child suffer. But many of the medications are associated with minimal benefit, if any, and some are associated with risk. If you are caring for a child less than 12-years-old, attempt to use as many of the safe and proven interventions before using over the counter medications that lack proven safety or benefit. These include providing rest, hydration, humidification (with a cool mist humidifier), nasal saline and pain relievers/fever reducers.

If you use other medications monitor for effectiveness. If they do not seem to be helping do not use them.

I have provided a list of all the items that should make up a cold kit. The content of the cold kit will depend on the age of the person the kit is for. Over the counter medications come in different forms; some medications are liquid, some are chewable and some are pills. Usually adults like to take pills whereas children use chewable or liquid medication.

I have put together suggested items for a [cold kit](#). I have suggested products that have one active ingredient. Products that have multiple ingredients are more complicated to use and are more likely to give you medication that you do not need and more likely to give you side effects or negative effects.

The cold kit is broken down into multiple medications. When you have a cold you should increase fluids, rest, use a cool mist humidifier and nasal saline. If these interventions do not manage your symptoms add a dose of the medication that will treat the [symptoms](#) that are most affecting you. For example, if you are most affected by nasal congestion, then the nasal decongestant, pseudoephedrine can be taken. If you are most affected by a dry cough than the addition of guaifenesin will most likely provide you with some relief.

#### *Checklist*

- Cool mist humidifier
- Nasal saline
- Suction bulb – if you have a child who cannot blow the nose (usually children can start to effectively blow their nose at about four years of age)
- Ibuprofen (pills, chewable or liquid)
- Acetaminophen (pills, chewable or liquid)
- Measuring spoon
- Nasal decongestants (use if nasal saline, a cool mist humidifier and steam do not improve congestion). Consider both topical and oral products. If you have a contraindication to these products consider the vapor decongestant.
- Expectorants should be used if there is mucus that you cannot expel – either in the chest or in the head. The primary over the counter expectorant is guaifenesin (Mucinex).
- Cough suppressants should be used only if up at night coughing or coughing is causing significant discomfort. Consider over the counter products such as dextromethorphan polistirex (Delsym) and dextromethorphan (Robitussin - DM).
- Antihistamines should be used only if you are sneezing, have a runny nose and/or itchy eyes.
- A [sore throat](#) product of choice should be kept on hand.
- Nasal strips can be helpful for people with significant nasal congestion as it widens the nasal passage and helps breathing.

## Chapter 6: Sinus infections

Sinus infections are another cause of head congestion. They are typically the common cold that has gone awry.

Sinus infections are a very common reason for antibiotic prescription. Acute bacterial rhinosinusitis (ABRS) (which is the medical way to say sinus infection) is often misdiagnosed when a common cold is present. This leads to the overutilization of antibiotics. It is the fifth most common diagnosis for which an antibiotic is given<sup>20</sup>.

The average adult is plagued with 2-4 colds each year and children are afflicted with 6-8 colds each year<sup>21</sup>. The common cold is associated with symptoms that make you feel sick – sinus pressure, sinus congestion, sneezing, runny nose and fever. Symptoms usually improve over a 3-7 day period and if they do not get better or get worse, a bacterial sinus infection may be present.

A virus or bacterium causes sinusitis. Bacterial sinusitis is diagnosed when symptoms are present beyond 10-14 days.

A true sinus infection can be associated with many different symptoms including: nasal congestion, thick nasal drainage, cough, face or dental pain, increased facial pressure when leaning forward, headache, sore throat, post-nasal drip, bad breath, fatigue, fever and decreased ability to smell.

One of the most important jobs of a health care provider is differentiating between viral sinusitis and bacterial sinusitis ([cold versus sinus infection](#)). This is challenging. Certain questions need to be considered by patients and health care providers when differentiating between the two conditions.

- How long have the symptoms been present? The most common way to differentiate between viral infections and bacterial sinusitis is the duration of symptoms. It is much less likely that an antibiotic will help treat the infection if the symptoms have been present for less than 10 days. When symptoms persist beyond 10 days and there are least two of the following present an antibiotic may be helpful. These symptoms include: earache, poor response to decongestants, colored nasal discharge, or facial/sinus pain<sup>22</sup>.

- Are any complicating factors present? Those with complicating factors are candidates for more rapid treatment. Individuals with a past medical history with recurrent sinusitis, nasal polyps, or a severely deviated septum are candidates for more rapid treatment.
- Are there severe symptoms present? Severe symptoms include: temperature of greater than 102 degrees Fahrenheit and purulent nasal discharge for at least 3-4 consecutive days in an ill child<sup>21</sup>. Those with severe symptoms warrant treatment before seven days.
- Is there improvement? Symptoms that hang on frustrate some people. It is not uncommon for symptoms to hang on for beyond 7 days, but there should be some improvement noticed.

#### **Other diagnoses to consider**

- Viral sinus infections
- Fungal sinus infections
- Rhinitis medicamentosa is a fancy term for saying that your body has gotten too used to topical nasal decongestants. It occurs when topical nasal decongestants are used longer than 3-5 days. It presents with nasal congestion that cannot be relieved without the decongestant spray.
- Rhinitis – inflammation of the nose - is associated with nasal congestion, post-nasal drip, runny nose and sneezing. It may also occur with facial pain. It is associated with nasal polyps, pregnancy and some medications (certain blood pressure medications, estrogen, cocaine, and non-steroidal anti-inflammatory medications such as Motrin).
- Allergic rhinitis (allergies) is associated with sneezing, runny and itchy nose, watery and itchy eyes, cough and postnasal drainage.
- Nasal polyps
- Bronchitis is associated with cough, chest tightness or shortness of breath.
- Pneumonia has a productive cough, fever and shortness of breath.
- Epiglottitis is a condition where tissue that is attached to the root of the tongue becomes inflamed. This is a rare condition. It present with nasal congestion that is not severe and there will be a sore throat, painful

swallowing and a muffled voice. This is more common in those who have not been immunized.

Children with sinus infections may have less severe headache and facial pain when compared to adults. Children are also more likely to have persistent nasal congestion, daytime cough and gagging on mucous with occasional vomiting.

Chronic sinusitis is a sinus infection that lasts beyond 12 weeks and are more common in those with nasal polyps, a deviated septum, are immunocompromised (have cancer or HIV) or suffer from allergies. It is characterized by chronic nasal congestion but is also associated with fatigue, post-nasal drip and headache.

### **Testing for infections**

Most cases of sinus infections do not require medical testing other than an interview and physical exam by the doctor. The use of x-rays and other radiological tests are not generally recommended, as they are not very accurate.

There are times that x-rays, CT scans or MRIs are indicated. It is sometimes used in those with a complicated case of sinusitis, or those who are not responding to treatment or if there is concern of a complication. The best test to pick up a sinus infection is the CT scan. X-ray is often used but it lacks sensitivity. Ear, nose, throat specialists will sometimes run more fancy tests (such as nasal endoscopy [sticking a camera up the nose] or culturing sinus material).

### **Complications**

Complications are not common in sinus infections. Some people are more likely to get complications than others. Those who have a weakened immune system are more prone to complications including those with HIV, diabetes or cancer. Certain factors may be indicative of complications and need rapid follow up (see the Red Flags section).

Complications include:

- Blood stream infections
- Chronic sinus infections
- Infection of the bones in the face
- Meningitis

- Abscess
- Asthma exacerbation
- Inability to smell or taste
- Cavernous sinus thrombosis (the formation of a blood clot within the cavernous sinus)

### **Red Flags**

- High fever
- Confusion
- Double vision
- Swelling of in the forehead or around the eyes
- Inability to move the eyes
- Confusion
- Infraorbital hyperesthesia (decreased sensation over the face)

### **Treatments**

The goals of treatment include:

- Prevention of complications
- Avoiding chronic infection
- Getting rid of infection
- Avoid unnecessary antibiotic use

Treatment of nasal congestion includes both medication and non-medication methods to relieve symptoms. Rest and hydration should be employed in those with sinus infections. Fluid thins the mucus and helps the body get rid of it. Fluid will also help prevent dehydration, which is especially important in someone with a fever.

Utilization of humidity should improve symptoms. A hot shower or a cool mist humidifier may help provide some relieve. Applying a warm washcloth over the sinuses may ease pressure in the face.

Nasal saline improves runny nose, nasal congestion, sore throats, cough and the number of sick days in children with cold symptoms<sup>23</sup>. Salt-water gargles can relieve sore throat that often accompanies sinus infections. Multiple over the counter products are available for the relief of [sore throats](#).

### ***Over the Counter Medications***

Over the counter medications may provide significant relief of symptoms but they are not as effective in kids as they are in adults. Many over the counter medications need to be used with extreme caution in many people.

Over the counter medications have been thoroughly studied in adults, but these medications have not been studied as well in children. New labeling laws have recommended that the use of many over the counter medications be limited in children under the age of 4. Many of the complications resulting from over the counter medication use in children have been from incorrect dosing. Caregivers need to assure proper doses when giving medications to children.

#### *OTC medications in sinus congestion*

[Antihistamines](#) are not recommended for those with bacterial sinus infections. These medications may thicken nasal secretions. The first generation antihistamines may lead to sedation. Other side effects include: dry mouth, blurred vision, constipation and inability to urinate. They are effective at managing the symptoms of sneezing, runny nose and watery eyes. Second-generation antihistamines are effective in the treatment of allergic symptoms but are not recommended in sinus infections.

[Decongestants](#) are effective medications in the treatment of nasal congestion. They come in a variety of forms, including: oral, nasal spray or vapor inhaler. Decongestants reduce nasal congestion by constricting the blood vessels in the nose. It also constricts blood vessels in other parts of the body and may lead to an increase in blood pressure. Topical decongestants should not be used for more than 3 days as it may lead to chronic congestion and reliance on the topical decongestant.

The last OTC medication that may provide benefit in sinus infections is guaifenesin (see table 8). There are multiple formulations of this product. The benefit of this medication is that it thins mucus and help the body get rid of it. In sinus infections the combination of guaifenesin with pseudoephedrine may be helpful.

Analgesics and antipyretics are helpful in the management of pain and fever. Ibuprofen and acetaminophen are the two most commonly used medications in the treatment of pain and fever.

## **Antibiotics for Acute Sinusitis**

Most patients with sinus infections have a viral sinusitis and will not derive benefit from antibiotics, but there are times that antibiotics are helpful. Unfortunately, antibiotics are a very common prescription given to patients for colds.

When symptoms persist beyond 10-14 days bacteria may be causing some of the symptoms and the use of antibiotics may resolve the infection. See the [antibiotic table](#) for common antibiotics. Some patients may actually clear their infection without the assistance of antibiotic even if symptoms have persisted beyond 10-14 days<sup>24</sup>.

Adults who have mild symptoms such as mild pain and a fever of less than 101 degrees Fahrenheit may be treated with close monitoring and symptom management instead of antibiotics<sup>25</sup>.

Sinus infections are typically diagnosed without diagnostic tests and treatment is based on factors the doctor ascertains from the patient. Amoxicillin – which is a type of penicillin - is recommended in both adults and children as the first line antibiotic of choice in bacterial sinus infections.

Trimethoprim/Sulfamethoxazole (TMP-SMX), azithromycin (Zithromax), clarithromycin (Biaxin) and some quinolones can also be used in adults who are highly allergic to penicillin. The nation has seen an increase in the amount of resistance there is to TMP-SMX and avoiding this antibiotic may be the best strategy, if another option exists.

Individuals whose allergic reaction does not involve difficulty breathing or hives may consider the use of a [cephalosporin](#) the treatment of sinusitis. About 10 percent of people who are allergic to penicillin are also allergic to cephalosporins.

### **What is to be expected?**

Improvement should be noticed in 3-5 days with complete resolution by day 12. Individuals who do not respond to treatment may need a different antibiotic in the treatment of sinus infections. The second line choice to amoxicillin is amoxicillin-clavulanate (Augmentin) or cefuroxime axetil (Ceftin)<sup>26</sup>.

### **Prevention**

Those with recurrent sinusitis should be evaluated for allergens, structural abnormalities or environmental factors that may be contributing the disease. Pollution, mold, cigarette smoke or barotrauma can contribute to recurrent infections. Testing for allergic rhinitis, nasal polyps or a septal deviation may provide a cause of recurrent infection.

The same strategies used to prevent the common cold are also helpful in the prevention of sinus infections.

### **Questions to Ask Your Health Care Provider**

1. Are my symptoms related to a virus or a bacterium?
2. Which medications do you recommend to manage my symptoms?
3. Will an antibiotic help my condition?
4. Is there any potential interaction between the medications that you are recommending and the current medications that I am on; or any other health problems I have?
5. When should I expect an improvement in my condition?
6. What complications should I look out for and how will they show up?

## Chapter 7: Earache

*Maggie, a four-year-old girl, is brought to the doctor by her mother. Mary has had a cold for the last three days and has not slept well. She is rubbing her right ear and says her head hurts for the last day and a half. The pain has been on and off and she reports that she does not have any pain right now.*

*The doctor notices she has a temperature of 99.4 degrees Fahrenheit and a heart rate of 110 beats per minute. The inside of her nose is red and there is some congestion noted on exam. The throat is red but the tonsils look normal. The right eardrum is red but the doctor determines that there is no fluid behind the eardrum.*

Acute otitis media is a bacterial or viral infection of the middle ear. It is one of the most frequent reasons for visits to the health care system and most commonly affects children between 6 months and two years old.

Three-fourths of children will have at least one ear infection by the time they are three and about fifty percent have more.

There are multiple types of ear infections, but this chapter will focus on acute otitis media, which is the most common type of ear infection. Other types of inner ear problems that may lead to pain include:

- Middle ear effusion without infection is associated with fluid behind the eardrum. It commonly occurs after an acute infection and may last for days to weeks. Those with middle ear effusion without infection do not appear sick.
- Chronic suppurative otitis media is a continual infection, which often results in a tear in the eardrum.

### **Risk Factors**

Certain characteristics increase the risk of an ear infection. Risk factors include:

- Age between 6 months and 2 years old. The Eustachian tubes are shorter and straighter reducing the ability of mucus to drain from the ear. When mucus sits in the ear and does not drain bacteria is more likely to grow.
- Allergies

- Large adenoids (glands that are located at the back of the throat) interfere with Eustachian tube function and increase the risk of infection. This may be suspected in the child who snores a lot, stops breathing during sleep (sleep apnea) or has chronic nasal obstruction.
- Children in daycare
- Native Americans, Inuit ethnicity and Alaskan natives
- Male children
- Pacifier use
- Season (fall and winter season)
- Those with Down's syndrome and cleft palate are at higher risk.
- Exposure to cigarette smoke
- Increased environmental pollution
- Genetics

Some people do not respond to treatment as well. Individuals who fail treatment can be somewhat predicted. Those at increased risk to fail treatment for ear infections include:

- Children in daycare
- Those with another sibling at home
- Previous history of middle ear infection
- Recent use of antibiotics

Other causes of ear pain include:

- Outer ear infections
- Upper respiratory tract infections
- Fluid behind the ear
- Skin problem in the ear – boil
- Infection of the throat
- Irritation of the temporomandibular joint
- Dental abscess
- Foreign body in the ear
- Excessive ear wax

### **Red flags**

- Severe pain

- History of head trauma
- Stiff neck
- Tenderness of the bone around the ear
- Drainage or blood from the ear
- Swelling around the ear
- Excessive drowsiness or sleepiness

**Diagnosis**

An evaluation for middle ear infection requires the documentation of six factors. Some of these factors require the input of a health care provider.

1. Age of the patient
2. Fever
3. Level of pain
4. Onset of the pain
5. Middle ear inflammation
6. Fluid in the middle ear

Based on these six factors the patient is classified into: certain diagnosis versus uncertain diagnosis and is it a severe infection or a non-severe infection. These factors also help determine who needs to be placed on antibiotics and who can be monitored.

*Table 5: Classifying ear infections*

| Certain diagnosis  | Uncertain Diagnosis   | Severe infection   | Non-severe infection   |
|--|---|--|--|
| All three criteria must be met: <ul style="list-style-type: none"> <li>• A rapid onset of symptoms</li> <li>• Fluid behind the eardrum</li> <li>• Inflammation of the eardrum</li> </ul> | Two or less of the criteria under certain diagnosis are met | Moderate to severe ear pain or a temperature greater than 39 degrees Celsius characterizes severe infection. | Mild ear pain and a temperature less than 39 degrees Celsius characterizes non-severe infection. |

A rapid onset of symptoms mean that ear pain, pulling at the ears, irritability and/or fever came on abruptly. Ear pain is the most specific finding that suggests ear infection. Ear pain that interferes with sleep or daily activity is not uncommon.

Signs and symptoms of middle ear inflammation characterize ear infections. This means that when a doctor looks in the ear, the eardrum is red. Many people (including many health care providers) think that the only criterion necessary for the diagnosis of an ear infection is a red eardrum. Not only does the inflamed eardrum need to be present, but there needs to be fluid behind the ear and pain to assure a certain diagnosis.

Fluid behind the ear can be seen by the health care provider or if the health care provider notices the eardrum does not move well when air is blown against it. This is the reason that you see a bulb on a otoscope. When the bulb is blown it pushes a puff of air against the eardrum. Normally the eardrum moves. If it is infected there will be limited or no mobility in response to this puff of air.

### **Otitis Media with Effusion**

One place where antibiotics are tremendously over prescribed is in the person with otitis media with effusion (OME). OME is fluid in the middle ear without infection. This is when the eardrum is pushing out and does not move well when air is blown up against it or when the doctor sees fluid behind the ear.

This condition is differentiated from acute otitis media or middle ear infection because it lacks any inflammation or any acute onset of symptoms. In OME the ear is not red. The condition can be quite annoying for the person it afflicts, but antibiotics do not help.

In OME the Eustachian tube is blocked. The Eustachian tube is what drains fluid and when it is blocked fluid remains in the middle ear and causes the symptoms associated with OME.

Some people are at increased risk for otitis media with effusion including those<sup>27</sup> who are smokers or who live with a smoker, are in daycare, have older sibling(s), have behavioral problems such as inattention and speech/language delays.

### **Other diagnostic tests**

When more extensive diagnostic testing is needed than a referral to a specialist (such as an ENT) is often warranted.

- Tympanometry evaluates fluid in the middle ear, ear canal volume and the mobility of the middle ear.
- Tympanocentesis can be done for kids who are sick, failed multiple courses of antibiotics or have immune deficiency. In this test a sample of the fluid in the middle ear is collected and the fluid tested for what type of bacteria is in it.
- Hearing tests may be done by an audiologist for those with chronic ear infections.

### **Red Flags**

- Lethargic
- Stiff neck
- Inability to drink or eat
- History of head trauma
- Tenderness in the bone around the ear

### **Treatment**

#### **Acute otitis media**

The majority of ear infections will clear in 1-2 weeks without antibiotics<sup>28</sup>. Many people should consider delay in antibiotics when diagnosed with an ear infection. It has become an unwritten social standard that antibiotics are needed for ear infections. But, this is not true. Some people will heal the infection without antibiotics. By avoiding antibiotics the patient will reduce the risk of side effects and lessen the burden of antibiotic resistance.

Determining which patients have severe versus non-severe infection and those who have certain versus uncertain diagnosis will help determine who is going to benefit most from treatment with antibiotics. In addition to these factors age needs to be looked at.

*Table 6: Treatment for Ear Infections*

|                        |                         |                  |
|------------------------|-------------------------|------------------|
| Less than 6-months-old | 6 months to 2-years-old | Over 2-years-old |
|------------------------|-------------------------|------------------|

|  |  |  |
|--|--|--|
| Treat for ear infection if the diagnosis is suspected. | Certain diagnosis and/or severe disease – treat with antibiotics | Treat with antibiotics if there is severe illness when the diagnosis is certain.                                   |
|  | Uncertain diagnosis and non-severe disease – may wait and see    | If the diagnosis is uncertain or if certain and non-severe symptoms than an observation period can be implemented. |

As you can see from the above table, not everyone with a diagnosed ear infection needs to be treated with antibiotics. Some patients may participate in the wait and see approach to ear infections.

The wait and see approach involves monitoring the disease for 48-72 hours. Over this period of time the person with the ear infection is given pain medications including: acetaminophen, ibuprofen or numbing eardrops.

In most cases the body will heal itself while pain medications are given to treat the symptoms during the healing process. If the patient worsens over that period of time than a re-evaluation should ensue (see section below). Worsening is indicated by: worsening pain or increased fever.

These new guidelines are endorsed by the Center for Disease Control and focus on judicious use of antibiotics. Acute otitis media is a common reason for an antibiotic prescription in the United States for children. With the rising concern about antibiotic resistance it is important that antibiotics are used appropriately.

In my personal practice as a nurse practitioner I try to implement these practices with every case of ear infection that I see. In almost every case, when I

explain the guidelines of the wait and see approach the patient and or parent/guardian looks at me like I have two heads. I hear multiple responses, like: “My doctor always prescribes antibiotics for ear infections,” or “Ear infections don’t go away on their own”.

It is going to take a lot of effort for these guidelines to be accepted by health care providers and patients. It has been a long practiced tradition to prescribe antibiotics for all cases of ear infections. It will take time, effort and education to reduce the prescribing of antibiotics for ear infections.

As a personal note, I have three children. Over the years my children have totaled around ten ear infections. I have never once treated them with antibiotics for the ear infections. All of the infections resolved and there were no complications.

### **Treating the Symptoms**

Not treating with antibiotics does not mean that you do nothing. Pain needs to be controlled. This applies if antibiotics are given or if the wait and see approach is undertaken.

Pain control usually involves an oral medication such as ibuprofen or acetaminophen. Eardrops may be helpful in the management of ear pain. Antipyrine/Benzocaine (Auralgan) are a numbing drops that are available by prescription and used to treat ear pain. The medication is placed in the ears, typically 1-4 drops every 1-4 hours as need for pain relief. A cotton plug can be moistened with the medication and placed into the ear.

Runny nose often comes along with ear infections and while antihistamines may improve the runny nose it may prolong middle ear effusion. Decongestants reduce nasal congestion but do not benefit otitis media<sup>29</sup>. The use of decongestants, antihistamines and mucolytics are not recommended for use in otitis media<sup>27</sup>.

Generally patients assume that antibiotics are required for ear infections. Antibiotics shorten the symptoms in only 5-14% of children by about one day. Approximately 5-10 percent of children have side effects from antibiotics including serious allergic reactions or the possible development of antibiotic resistance<sup>29</sup>. The benefits of antibiotics are not as great as many people think.

Most health care consumers assume that treatment with antibiotics is necessary for all cases of ear infections. Research suggests that most do well without antibiotics. For one child to benefit, between 7 and 20 children need to be treated with antibiotics<sup>27</sup>. The beneficial effects of an antibiotic in regard to symptom management are mild at best. One of every fifteen children treated with antibiotics for ear infections have some reduction in pain after two to seven days<sup>30</sup>.

Some individuals see more benefit from antibiotic treatment<sup>31</sup>. This includes: those less than six-months-old; those between 6 months and 2-years-old who have a certain diagnosis (see table 5); those less than two-years-old with an ear infection in both ears; those with ear infection and discharge; and those children over two years-old with severe infections.

### **Watch and Wait**

Based on the fact that antibiotics are not overwhelmingly helpful and have the potential to do harm, monitoring some patients with ear infections is an appropriate strategy. Certain facts need to be kept in mind when the watch and wait approach is implemented.

- The patient should be watched closely.
- A responsible parent or guardian should be able to determine if the patient is not improving or is getting worse.
- The patient should have a reliable method to get to the health care provider or hospital.
- Individuals who do not improve over 48-72 hours may be a candidate for an antibiotic.
- Not improving is indicated by continued pain, persistent fever, persistent irritability, poor food and fluid intake and poor sleeping.

### **When Antibiotics are Necessary**

When antibiotics are chosen the type of antibiotic is important. A high dose of amoxicillin given twice a day for 10 days is recommended for the young child. Children who are over 6 and have mild to moderate disease can be treated with a more conservative dose for five to seven days.

While amoxicillin should be considered a first line medications in most patients, it is not meant for everyone. The following groups of people should take another antibiotic.

- Those with an allergy to penicillin
- Very ill children
- Those who have been on an antibiotic within the last 30 days
- Those already taking amoxicillin
- Those who have not responded to the medication

The type of allergy is important to determine, as there are many medications that have a similar profile to amoxicillin. If the allergic reaction was difficulty breathing, swelling of the throat or hives, than any antibiotic that closely resembles amoxicillin should be avoided. If the reaction was mild, such as a mild rash, than other medications in a similar class of drugs ([cephalosporins](#)) can be considered.

When the allergic reaction is severe – called by doctors a class I allergy – than the use of a [macrolide antibiotic or clindamycin](#) should be considered. When the reaction is not a type I reaction than a cephalosporin may be appropriate.

When children present with severe ear pain or temperature above 39 degrees Celsius a stronger drug – such as amoxicillin-clavulanate - may be considered. Some extremely ill children may warrant the antibiotic be given as a shot.

When antibiotics are started the patient should notice a response in the first 48-72 hours. The fever should go away and the pain should improve. A slight worsening in symptoms may herald the first 24 hours. If the improvement is not noticed a follow up appointment with the health care provider is indicated.

Failure of antibiotic therapy is not unusual. When amoxicillin fails the use of erythromycin or TMP-SMX is not recommended, as the organism responsible for the ear infection may also be resistant to those medications. A second line antibiotic is appropriate (amoxicillin-clavulanate) and when that does not work an injectable medication, clindamycin or referral to an ENT doctor may be appropriate.

**Not again**

Many people, particularly young children, have recurrent infections. Recurrent ear infections are more common in those children who are in day care; have a family history of recurrent ear infections; those exposed to tobacco smoke; those with allergies; those who had their first infection before six months of age; those with Cleft palate, Down's syndrome or another craniofacial abnormality; those who are (were) not breastfed; or those who have a Native American or Inuit heritage. Three or more cases of acute otitis media during a respiratory season or more than four per year defines recurrent infection<sup>32</sup>.

Many things can be done to reduce the risk of recurrent ear infections.

- Antibiotic prophylaxis may be considered in those with recurrent disease.
- Assure proper vaccinations
- Ear tubes
- Treat allergies – some of the worse ear infections that I have seen have come in people with uncontrolled allergies
- Avoid daycare
- Avoid tobacco smoke
- Breast feed infants
- Do not feed young children flat on their back
- The use of xylitol syrup or gum may reduce ear infections<sup>33</sup>.

### **Complications**

Complications are not common, but need to be watched out for. Common complications include:

- Mastoiditis – infection of the bone around the ear
- Meningitis – infection of the area around the brain
- Hearing loss
- Lateral sinus thrombosis
- Abscess
- Chronic infection
- Facial nerve paralysis
- Speech or language delays
- Labyrinthitis – an inflammation of the inner ear that can lead to balance or hearing problems

- Rupture of the ear drum
- Tympanosclerosis (calcium plaques on the eardrum)

Many people will worry that if they do not promptly treat their ear infection than they are at risk of complications. Research suggests that initial observation does not increase the risk of mastoiditis or meningitis in children<sup>34</sup>.

Complications occur in 1/100,000 kids and in 1/300,000 adults<sup>35</sup>. Computed tomography (CT) or Magnetic resonance imaging (MRI) is used to evaluate for complications.

Ear, nose and throat (ENT) doctors should see all patients with a suspected complication. Other indications for seeing a ENT doctor include:

- When ear tubes are being considered
- Recurrent ear infections
- Hearing loss
- Those with cleft palate, craniofacial abnormalities, Down's syndrome
- Otitis media lasting longer than 2 months
- Ear infections that do not respond to therapy

### **Otitis media with effusion**

Otitis media with effusion (OME) is fluid in the middle ear in the absence of infection. Effusion after an ear infection is common and it does not mean that the ear infection was treated incorrectly. It sometimes takes a little longer to go away, but usually goes away without interventions.

Those with otitis media with effusion may complain of muffled hearing or feeling like their ear is full.

### **Risk factors for OME include:**

- Those with chronic allergies
- Exposure to cigarette smoke
- Respiratory infection
- Airplane travel
- Descending on a mountain road
- Less than 2 years old
- Season: winter or early spring

Young children need follow up if there is an effusion present. Seeing the doctor every 3-6 months may be needed to assure that the effusion resolves. Unresolved effusion could lead to long-term hearing problems and possibly developmental delays.

### **What can be done to treat effusions?**

- Auto inflation – this can be done by forced exhalation with the mouth and nose closed. This is an attempt to open the Eustachian tubes. This will raise blood pressure and should not be attempted by anyone with high blood pressure or any type of cardiovascular disease.
- Avoiding allergens (dust, pollen etc.) and cigarette smoke
- Decongestants, expectorants and antihistamines are not helpful
- Ear tubes can be used if they are persistent
- Persistently inflamed or large adenoids that lead to nasal obstruction with recurrent ear effusion even after tubes are placed would warrant adenoid removal.

Prevention of OME involves many of the same strategies as treatment. Preventing ear infections is one of the most important things to prevent OME. Preventing ear infections involves preventing colds and sinus infections. Strategies to do this include: frequent hand washing, avoiding day care if possible and avoiding irritants such as cigarette smoke and allergens. Assuring adequate vaccination is also an important part of preventing ear problems. Encouraging mothers to breast-feed will also prevent ear infections. Young children should not be fed when lying flat on the back.

Medical science does not have good answers for the ideal way to treat OME. Observing the effusion for about 2 weeks is a reasonable option as antibiotics are not effective in the long-term resolution of fluid behind the ear without infection. Nasal corticosteroids (medications commonly used to treat allergies), such as fluticasone (Flonase) or mometasone (Nasonex), may be used for 4 to 6 weeks if there is no improvement. If the effusion is still present after a course of nasal corticosteroids, a trial of antibiotics may be indicated. Oral steroids may also be tried if the previous measures fail. Lastly, placing ventilation tubes may be warranted if none of the above measure were successful.

Ventilation tubes are considered after six months of effusion in both ears with hearing loss. Those who have speech/language delays, behavior problems or learning problems may be candidates of earlier intervention<sup>36</sup>.

If hearing loss is present the patient should be sent to an ear, nose, throat specialist who will consider ventilation tubes. The benefits of tubes in effusion are not impressive<sup>37</sup>, but they are often done.

Ear tubes can be used for those with repeat ear infections as well. A small incision is placed in the middle ear and plastic tubes are placed. Tubes will allow fluid to drain from the middle ear, prevent buildup of fluid and improve comfort in those with fluid in the ear.

Tubes do come along with concerns including:

- Chronic ear drainage
- Thickened eardrums which may affect hearing (hearing problems are not common)
- Scared eardrums
- Perforation of the eardrum
- Tube could slip into the middle ear (rare)
- Tissue build up behind the eardrum (rare)

*What do you do when you have an earache?*

Earache is a common complaint in children and adults. Below are some questions to consider if you or your child has an earache.

1. How old are you?
  - If you are under 6 months and there is a concern of ear pain (fever, irritability, poor sleeping pattern) seek medical care and if an ear infection is considered than an antibiotic will be given.
  - If you are under 2-years-old (but older than six months) you need a health care provider to evaluate any ear pain, but you may not need an antibiotic.
  - If you are over 2-years-old and do not have a fever, are having only mild ear pain and have no red flags, than treatment of the pain is a reasonable option while the symptoms are monitored very closely.
2. What are your other symptoms?

- It is important to document fever when you have not taken a medication to reduce the fever. A temperature over 102 degrees Fahrenheit is more concerning and should be worked up.
  - Quantify the pain. Rate your pain on a scale from 0-10; 0 indicating no pain and 10 indicating unbearable pain. Pain that is rated as at least moderate (approximately 4 out of 10 or higher) may be a candidate for antibiotics.
  - Is there any itching, scaling or pain on movement of the ear? This may indicate an outer ear infection.
3. Is there discharge coming from the ear? What is the character of the discharge, is it earwax, pus or blood? Earwax is less alarming. Discharge in the child less than 5-years-old should be evaluated by a health care professional. A health care provider should evaluate discharge in the older child, when it is accompanied by ear pain, fever or blood. If discharge is associated with itching and scaling, swimmer's ear may be the diagnosis. Any discharge that persists more than five days should be worked up.
4. What have you done lately? Rapid changes in atmospheric pressure can cause ear pain such as plane rides or driving in the mountains. Pain in the ear after scuba diving should be worked up?
5. Is there a chance of a foreign object in the ear? If yes, an evaluation by a doctor is important.

### **Case study conclusion**

*Four-year-old Maggie is not complaining of severe pain and does not have a high fever. Her middle ear is red and her pain came on fast, the doctor noted no fluid behind the eardrum. Based on these findings she is a candidate for observation therapy.*

*Maggie's mother is told that she should follow up if there is any worsening of symptoms. It is explained to the mother that most patients will spontaneously heal over 48-72 hours. She is given a prescription for Antipyrine/benzocaine otic solution (numbing ear drop) and taught about the use of ibuprofen. Maggie's mother has a reliable method to communicate with the provider, has access to health care and is able to recognize signs of serious illness.*

*In two days Maggie returned to the office with increasing ear pain and a fever. Her right tympanic membrane was red and did not move when the doctor puffed air at it (this indicates fluid behind the ear). At this point she had a certain diagnosis of ear infection with moderate symptoms and therefore was offered treatment with amoxicillin twice a day for 10 days. She resolved her infection without incidence.*

**Key questions to ask your doctor when you have an ear infection**

1. Do I have a certain ear infection?
2. Is my ear discomfort coming from an infection or is there another cause such as fluid behind my ear?
3. I want to avoid antibiotics if I can. Is a wait and see approach appropriate for my ear infection?
4. Which medications do you recommend to manage my symptoms?
5. Are there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
6. When should I expect an improvement in my condition?
7. What complications should I look out for and how will they show up?

## Chapter 8: Outer ear infection

*John is an 8-year-old male who returned from his vacation in North Carolina yesterday and went to his doctor's office with ear pain, itching and a small amount of discharge oozing from the ear. It all started about three days ago and has gotten progressively worse. His vacation included daily swimming trips to the ocean.*

*On exam, John's temperature, heart rate and blood pressure are all normal. The doctor finds nothing unusual on exam except a red and swollen right ear canal that has thick flakes. There was pain when the doctor pulled on the ear to insert the otoscope. The eardrum was normal.*

Swimmer's ear – also known as otitis externa (OE) – is a common problem that afflicts mostly children who are involved in water activities. Its cause is usually bacteria, but sometimes fungus grows in the ear or allergy or trauma causes the problem. The condition should be prevented if possible but treatment of active disease will reduce the duration of the disease and reduce the risk of complications.

It is most common in children between the ages of 7 and 12 and affects 4 of 1000 people every year<sup>38</sup>. It is usually caused by moisture in the ear. The ear canal has very thin and sensitive skin.

Any type of trauma – from a q-tip or fingernail for example – may lead to an infection of the outer ear. Many people like to clean their ears but this could lead to problems through two mechanisms. The process of cleaning the ear may lead to trauma that could predispose to infection. Also, earwax protects the lining of the ear canal and when it is removed the natural environment is disrupted, which increases the risk of infection. On the other hand, too much cerumen in the ear canal can trap moisture, which sets an environment that may lead to an outer ear infection.

An infected hair follicle – furuncle – can cause swelling and redness and can lead to an outer ear infection.

The person with an outer ear infection will complain of

- Ear pain
- Discharge form the ear

- Itchy ear
- Sensation of fullness in the ear
- Reduced hearing if swelling becomes severe

Rarely will the condition be chronic. If symptoms last beyond three months chronic otitis externa must be considered. This may indicate another problem such as an underlying skin problem like contact dermatitis, an untreated fungal infection or a resistant strain of bacteria.

Other causes of chronic ear symptoms include: temporomandibular joint dysfunction, chronic Eustachian tube dysfunction, chronic otitis media and cancer of the ear.

The health care provider will diagnose outer ear infections based on the history as outlined above and with a physical exam. The health care provider will notice redness and swelling in the ear canal.

#### **Risk factors for outer ear infections**

- Recent history of swimming
- History of diabetes, acne, eczema, psoriasis, seborrhea and diseases that affect the immune system such as HIV or cancer
- History of trauma

#### **Other causes of ear pain**

- Inner ear infection
- Infection of the bone around the ear
- Foreign body in the ear
- Boils
- Shingles
- Excessive ear wax
- Wisdom tooth eruption
- Bullous myringitis – inflammation of the ear drum with blisters

#### *Complications*

Most cases of outer ear infections resolve without problems, but occasionally complications arise. The following are a list of complications that should be considered.

- Malignant OE usually results from chronic OE. This is not a common problem and is more likely to be seen in those who have a condition that compromises their immune system such as diabetes. It is characterized by extreme pain, high fever, blackening of the ear canal, hearing loss, nerve damage and sometimes stiff neck or severe headache. Those with malignant OE should have blood work and a CT scan.
- Osteomyelitis is an infection of the bones around the ear.
- Hearing loss
- Inflammation of the cartilage around the ear

### **Red flags**

- High fever
- Severe pain
- Swollen lymph nodes in the neck
- Redness around the outside of the ear
- Tenderness of the bone around the ear

### **Treatment**

Sometimes the ear canal needs to be cleaned out by the health care provider so a more complete look at the ear can be done. This will also improve the ability of any medication prescribed to penetrate deeper into the ear. Cleaning the ear can be painful in some and may not be possible

The mainstay of treatment is eardrops. Certain ear drops are dangerous if there is a tear in the ear drum ([see table](#)).

When the ear is swollen it may not be possible to deliver drops into the lower part of the ear. In this case the use of an ear wick will allow delivery of medication into the ear canal. The health care provider will place a small piece of cotton into the ear that will allow ear drops to penetrate into the lower ear canal.

Before putting the drops in the ear they should be warmed. The patient should lie on his or her side with the affected ear up. The drops should ideally be placed by another person and the flap of skin covering the ear canal – called the tragus – should be pushed a couple of times after the drops are inserted. The

person should lie on the side for 5-10 minutes to assure adequate penetration of the medication.

Pain control is helpful in the treatment of outer ear infections. The use of ibuprofen or acetaminophen is appropriate. Topical drops such as antipyrine/benzocaine can also be used.

### **Healing**

After starting the treatment improvement should occur within 48-72 hours and a complete resolution should occur in 7-10 days. If either of these conditions is not met, a follow up appointment with the health care provider should be attained.

Many reasons exist for persistent symptoms including:

- Local irritation due to preservatives in the medication
- A fungal infection being treated with medicine to treat bacteria
- Improper use of medication
- Other skin conditions leading to persistent disease

### **Prevention**

Those with a previous history of outer ear infections need to practice methods to reduce the risk of future episodes. Keeping the ears dry by using ear plugs or a swimming cap when swimming is one of the best ways to prevent ear infections. Using a blow dryer to the ear to apply a gentle flow of warm air –can reduce moisture in the ear after swimming.

Other tips include:

- Do not use q-tips.
- Keep hearing aids clean.
- Rinse away shampoo after showering.

Multiple over the counter ear drops can be used in those who have repeated exposure to water including:

- 2% acetic acid
- Multiple over the counter products containing Isopropyl alcohol including:  
Auro-Dri and Swim-ear.

Questions to Ask Your Health Care Provider

1. Are my symptoms related to a bacterial infection, fungal infection, or another cause?
2. Which medications do you recommend to manage my symptoms?
3. Would an antibiotic ear drop or oral medication help me?
4. Are there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
5. When should I expect an improvement in my condition?
6. What complications should I look out for and how will they show up?

## **Chapter 9: Sore throat**

Pharyngitis is the term doctors use to describe sore throat and it accounts for 10-15 percent of all pediatric office visits. Group A beta-hemolytic streptococcal pharyngitis (GABHS), more commonly known as strep throat, is a primary concern of a person with a sore throat. GABHS is more common in children than adults. In both kids and adults viruses are the most common cause of sore throat.

The most important concern in the person with a sore throat is to rule out some serious conditions associated with sore throat, including, most commonly GABHS. Certain factors will help predict if the cause of the sore throat is GABHS or a viral infection. The factors are not perfect and the use of a throat culture is needed in many cases in order to rule out strep throat.

Important factors to know about strep include:

- It most commonly affects children between 5-15 years old.
- It does not commonly affect children under three years old.
- It has an incubation period of 2-5 days. This means that if you have been in contact with someone who is infected and are infected your disease may not show up for 2-5 days.
- Respiratory secretions spread the infection.

### **Causes of sore throat**

Viruses cause the majority of sore throats. Bacteria cause 5-15% of sore throats, but those between the ages of 5-15 have a higher incidence of bacterial causes of sore throat. In this group, 15-30 percent of sore throats may be caused by GABHS<sup>39</sup>.

Certain factors can help determine if the sore throat is caused by a bacteria or a virus. Viruses that cause sore throat are more commonly accompanied by cough, stuffy nose, red eyes and fatigue.

### **Possible diagnoses**

- Viral sore throat – there are over 200 viruses that cause the common cold and each presentation may be a little different. Many of these viruses are linked to sore throat. Below some specific viruses that cause sore throat will be discussed.

- Hand-foot and mouth disease. This is caused by a virus that is called the *Cocsockie* virus. It causes blisters on the hands and feet as well as in the mouth or throat.
- Infectious mononucleosis can also cause sore throat. This sore throat is typically severe and associated with pus (white patches) in the throat. This disease is associated with swollen lymph nodes – particularly the glands on the back of the neck. It sometimes comes with stomach pain due to an enlarged liver or spleen. Those who are treated with penicillin will usually develop a rash (90% of the time). It is most common in those who are 10-25 years old and is accompanied by fatigue and a lingering sore throat.
- HIV is a rare cause of sore throat. Individuals who have risk factors for HIV (multiple sexual partners, men who have sex with men, intravenous drug users) who present with a sore throat should have this diagnosis considered.
- Bacterial sore throat. The most common cause of bacterial sore throat is GABHS. Other bacteria can sometimes cause sore throat.
- Fungal infections rarely cause sore throats. Candida infections are a common cause of fungal sore throat. The individual will have a sore throat with a white coat on the tongue and in the oral cavity that looks like cottage cheese. The white coating will bleed if it is scraped off.
- Diphtheria is a rare cause of sore throat. It presents with a sore throat, fever, tender lymph nodes in the front on the neck and serosanguineous nasal discharge. It can be prevented by routine vaccinations.
- Kawasaki disease rarely occurs but affects children under five and presents with sore throat, tender lymph nodes, fever, eye discharge, red oral mucosa, strawberry tongue, cracked red lips, swelling of the hands and feet and red rash on the hands and feet, followed by peeling of the palms.

- Peritonsillar abscess is a serious cause of sore throat and presents with fever, feeling wiped out, a hot potato voice, difficulty swallowing, painful swallowing, ear pain and difficulty opening the mouth.
- Miscellaneous causes of sore throat include: persistent cough, smoking, gastroesophageal reflux, postnasal drip secondary to runny nose, allergies, foreign body and thyroiditis (inflamed thyroid gland).

### **Complications**

Most sore throats are caused by a virus and go away on their own. It is important that all health care consumers are aware of when sore throats can be serious and when they are likely self-limiting.

Death is a risk of life, but it is rarely related to sore throat. Throat abscess (pus filled infection in the throat) may lead to breathing problems as the swelling in the throat reduces the ability to breath. Diphtheria can lead to respiratory failure. Untreated GABHS can affect the heart valves and has the potential to lead to heart failure.

These serious complications are rare. Rheumatic fever is one of the most common preventable complication of sore throat. It occurs after GABHS goes untreated. The general population is not as greatly affected, as people commonly believe. In fact it takes treating 3000 to 4000 people with antibiotics with strep throat to prevent one case of rheumatic fever<sup>40</sup>. The incidence of rheumatic fever is about one case per one million people<sup>41</sup>. Treatment with antibiotics do not guarantee prevention of rheumatic fever.

Rheumatic fever occurs about 3 weeks after an untreated GABHS infection. It is characterized by joint pain and swelling, erythema marginatum (pink rings on the trunk, arms and legs), heart murmur or subcutaneous nodules (painless, firm nodes over the bones or tendons often seen on the wrist, elbow or knees). If this is suspected an immediate evaluation with a health care provider is essential.

Peritonsillar abscess (pus behind the tonsils) can cause sore throat or can be a complication of GABHS. It is not common but is characterized by worsening sore throat, ear pain, inability to open the mouth, fever, and a hot potato voice.

A rash that feels rough, like sandpaper, is red and fades when you push in on it is likely scarlet fever. This rash will last about a week and will result in peeling of the skin. This is a common manifestation of streptococcal infection

Streptococcal infections have the potential to attack the kidneys. It may present 10-14 days after a strep throat. It is characterized by bloody urine and swelling (especially around the eyes). It is unclear if treating with antibiotics reduces the risk of kidney problems after strep throat.

### **Red Flags**

- High fever
- Unable to handle secretions - drooling
- Difficult time opening the mouth
- Hot potato voice (muffled voice, sounds like you have a mouthful of hot potatoes)
- Uvula (piece of tissue that hangs down in the back of the throat) deviating to one side
- One swollen tonsil
- Difficulty breathing

### **Diagnosing strep throat**

Key features of the history and the physical exam will help the health care provider determine the likelihood of streptococcal infection. There are a few key features that are most predictive of strep throat.

Recent exposure to *streptococcus* and white patches in the throat or on the tonsils are the two most important factors in predicting strep throat. Tonsils that are free from swelling or pus and non-tender lymph nodes in the neck are the best criteria for ruling out strep throat<sup>39</sup>.

Clinical prediction rules have been developed for helping the health care provider determine who has strep and who does not. None of these rules are perfect, and it usually requires the work of a throat culture to definitively determine who has strep throat. None-the-less, these key features can be useful in helping patients determining their risk for strep throat.

The prediction rule has been based off of five key criteria.

1. Fever above 100.4 degrees Fahrenheit

2. Swelling of the tonsils or pus on the tonsils
3. Sore throat in the absence of cough
4. Tender lymph nodes in the front of the neck
5. Age – One point is given if the age is between 3 and 14, and one point is taken away if over the age of 45.

Based on the number of criteria that are present one can take a guess as to how likely GABHS is. The person is given a score of -1 to 5 and utilizing that point total one can predict the likelihood of strep throat.

For example, if we look at the case study presented in chapter 2: *A 20 year-old female comes to her doctor with tonsillitis. “My nose has been stuffy for the last couple of days and I have been coughing. I woke up this morning and my throat hurt really badly. I looked in my throat and my tonsils were swollen and there were white dots on them.*

It is also determined that she did not have a fever. When the doctor felt the front of her neck, he determined that her lymph nodes were swollen and tender.

This patient receives one point for swollen tonsils with pus and one point for swollen lymph nodes. She has a point total of 2. Therefore, her risk of strep is about 17%.

**Table 7: Percent change of having GABHS based on number of clinical criteria<sup>42</sup>**

|         |     |
|---------|-----|
| -1 or 0 | 1%  |
| 1       | 10% |
| 2       | 17% |
| 3       | 35% |
| 4 or 5  | 51% |

As you can see from the chart, it is impossible to rule in or rule out strep throat just by doing an interview and physical examination. The CDC recommends that antibiotics not be given unless GABHS is found on strep culture. When there is a score of 4 or 5 many health care providers will treat instead of doing a culture and some clinicians even choose to treat if there is a score of 3 or more.

One fact that is not well know is that strep throat will go away on its own. Well, that is not entirely true. The symptom of sore throat will remit, but the bacteria

may still persist. It has the potential to go to the heart and cause rheumatic fever, it is therefore important to treat strep throat even though the sore throat will go away.

When sore throat persists beyond five days strep throat is not likely. It is more likely mononucleosis, a sinus infection, allergies or post-nasal drip.

### **Diagnostic Testing**

Who is a candidate for diagnostic testing?

1. All children with a sore throat
2. Selected adults with a sore throat. This includes adults with at least one feature suggestive of strep throat (swollen tonsils, pus on the tonsils, fever above 100.4 degrees Fahrenheit, swollen lymph nodes, sore throat in the absence of a cough)

What type of testing should be done?

1. A rapid strep test is indicated for most patients with a sore throat with a back up throat culture

If the rapid test reads positive, it is quite reliable. If it reads negative it may not be that reliable. Because of the tests ability to miss the diagnosis, it is recommended that the health care provider get a back up culture that is sent to the lab to confirm every negative rapid strep test. Some experts suggest you do not need a back up culture in the adult, but my experience suggests that you should do a back up culture in the adult.

The rapid test should not be used in those who had a positive strep test in the last 30 days as there still may be strep antigen fragments hanging around that could give a false positive test.

### **Other testing for sore throat**

When sore throat persists another diagnosis to consider is mononucleosis. This is most common in those 10-25 years-old. It can be testing by checking the blood for antibodies to the Epstein-bar virus. During the first week of the illness, the test may not pick up the disease but by the second week the test picks up the disease over 80% of the time.

Testing for HIV and other sexually transmitted diseases may be warranted in the high-risk individuals. Individuals who have oral sex may need the throat tested for gonorrhea.

Some cases of sore throat warrant a broad culture that looks for other causes of sore throat such as other bacteria.

### **Treatment**

Most cases of sore throat are either caused by a virus or GABHS. If strep throat is present treatment with antibiotics is important and if it is not present treatment of the symptoms is all that is necessary. Treatment of strep throat will reduce rheumatic fever, abscess formation, transmission and improve comfort. It is always important to stay alert for other complications of sore throat – even though they are rare.

There is a nine-day window that the clinician has to treat strep throat to prevent rheumatic fever after GABHS. Treatment will also speed healing. After starting treatment you should be feeling much better in 24-48 hours. Ideally treatment should be started within 48-72 hours<sup>43</sup>.

Some clinicians choose to treat patients while they wait for the return of the culture. Realizing that resolution will be faster and it will provide comfort to some patients.

This is not a wise strategy to implement for all patients. This requires some professional judgment of the treating health care provider. Those who are suspected of having strep are better candidates for this method of treatment. The goal is to avoid excessive exposure to antibiotics. When antibiotics are prescribed without a confirmed diagnosis the patient should be encouraged to stop antibiotics immediately if the culture comes back negative.

There is no resistance to penicillin in the United States, so it is the drug of choice<sup>40</sup>. Ten days of pills or a shot is equally effective in its management. People who will not take all of their medication should receive a shot.

Amoxicillin, which is a type of penicillin, is often used in place of penicillin in children, as the suspension of penicillin does not taste good. Amoxicillin suspension has a pleasant tasting bubble gum flavor.

Individuals who do not have angioedema (swelling deep in the skin near the eyes and lips) or hives as their allergic reaction to penicillin can be treated with first or second-generation [cephalosporins](#). If they are, they need to be watched closely as allergic reactions with penicillin sometime cross over to an allergic reaction to cephalosporins.

Erythromycin is recommended in patients with a severe penicillin allergy. Due to side effects – mainly gastrointestinal - [azithromycin or clarithromycin](#) is sometimes substituted.

Recurrent GABHS can be treated with amoxicillin-clavulanate (Augmentin). It is not usually picked as a first line medication as it is a more expensive and has a wider spectrum of activity. A wider spectrum of activity means that it is able to cover many other types of infections. The routine utilization of broad-spectrum antibiotics for simple infections has the potential to increase the risk of antibiotic resistance.

Penicillin should be used for 10 days in the treatment of GABHS to assure that all the bacteria are killed and no straggling bacteria remain.

### **Treating the symptoms**

Sore throat pain can be quite debilitating and managing that pain is a critical part of treatment. Symptomatic treatment often involves a combination of systemic medications and local acting medications.

Systemic medications include medications that are taken by mouth that can help relieve the pain of the sore throat and may also help other symptoms that accompany sore throats such as headache, fever and body aches. Systemic medications include: [ibuprofen, acetaminophen, naproxen](#) or acetaminophen/codeine (in severe cases). The use of medications to reduce pain and fever, in addition to reducing symptoms, may help shorten the course of disease by one to two days<sup>44</sup>.

Topical medications are available in many over the counter formulations and some can be made at home. A common home remedy is salt-water gargles, which can be made by adding one-fourth of a teaspoon of salt to 6-8 ounces of warm water. This concoction can be gargled and spit out every 3-4 hours. Sugar-free or regular Popsicles can help ease the discomfort of a sore throat.

Multiple over the counter medications are available for treating sore throat. They come in [sprays and lozenges](#).

Certain foods can help the throat feel better. For example, warm or cool liquids soothe and moisturize the throat. Nasal saline can moisturize the nasal passages and clean mucus out of the nose. This will reduce the amount of post-nasal drip, which will help reduce throat discomfort. Herbal teas may be helpful in the treatment of sore throat. Throat coat – a herbal tea - has a demulcent that is more effective at providing relief than regular tea<sup>45</sup>.

Certain prescription medications have the potential to aid a sore throat. Viscous lidocaine is a medication that comes as a thick liquid that the health care provider can prescribe that will numb the throat. It can also be mixed with other liquids such as liquid Benadryl and/or Maalox to ease the discomfort.

Steroids are used in some patients with sore throats. This is a prescription given by the doctor and can be given by mouth or as a shot. Steroids reduce the inflammation of a severely inflamed throat.

Home remedies for a sore throat:

- Salt water gargles as outlined above.
- A cool mist humidifier should be used. Many sore throats are caused by or exacerbated by dryness; the moisture that a cool mist humidifier provides can improve symptoms.
- Suck on a sour drop. Lemon drops or another type of drop will stimulate saliva and reduce throat pain
- Drink tea with honey as this will coat the throat.

### ***Follow up***

Improvement in the sore throat caused by a bacteria or virus is typically noted in 2-3 days. When there is no improvement or a worsening of symptoms noted a follow up with your health care provider should be attained to rule out a more serious (cellulitis or abscess) or another underlying condition (mononucleosis or chronic post-nasal drip).

Rarely, other bacteria can cause sore throat. This is much more common in the adult than the child. This may be considered when there is a non-response to antibiotics or a negative GABHS culture and the patient is getting worse. The

health care provider will often take a more broad culture to look for other bacteria that may be causing the sore throat.

At times further testing is indicated. This is not common, but may occur in the sore throat that is not explained by other causes. It is most often carried out by an ear, nose and throat specialist. A laryngoscope will be used to look for cancer, a foreign body, acid reflux or another cause of sore throat.

### *Recurrent Disease*

When disease returns within one week of completing antibiotic therapy it is considered treatment failure. The main causes of this are:

- Not taking the medication as directed
- Resistance to the antibiotic
- Repeat infections

For those who are thought to have a resistant strain, a different antibiotic may be considered such as a [cephalosporin, macrolide or amoxicillin-clavulanate](#)<sup>46</sup>.

In cases where there is repeat infection, family members should be checked to see if they are carriers of strep. If they have a positive strep culture, they should be treated.

### **What is a carrier?**

A surprising number of people – 10 to 25 percent – are colonized with GABHS<sup>46</sup>. When one is colonized, it means that the strep is living in the throat with out causing the person to be sick. Generally, those who are colonized do not need to be treated, but sometimes they do. Treatment should ensue when there is:

- A personal or family history of rheumatic fever
- Recurrent transmission between close contacts
- Significant anxiety about GABHS
- Consideration of removal of the tonsils to eradicate the carrier state

### **Tonsillectomy and Adenoidectomy**

Tonsils and adenoids are often removed, but the surgery may be done too often. The tonsils are there for a reason. The tonsils, while they often get infected, help fight infections in the throat and nose and keep the infection from spreading.

There are risks with this procedure. Bleeding is the most common complications and can occur up to eight days after surgery. Sore throat after the procedure is common. The voice sometimes changes after the procedure. The most worrisome complication is death, but this only occurs in one of every 250,000 operations.

The tonsils and/or adenoids can be removed for multiple reasons including:

- Recurrent GABHS: For two-year olds, more than 4 episodes a year; for three year-olds more than 3 episodes per year; and those over 3-years-old, greater than 6 episodes a year is an indication for the tonsils and adenoids to be removed.
- Obstructive sleep apnea
- A severe infection that does not respond to antibiotics
- Recurrent peritonsillar abscess
- Potential cancer
- Persistent mouth breathers may be a candidate for removal of the adenoids
- Persistent swallowing problems if they are caused by large tonsils or adenoids

### **What you need to know**

If you are diagnosed with strep throat:

- Do not infect others. Do not come in close contact with others for 24 hours after starting antibiotics.
- Removable oral appliances (e.g. retainers) should be cleaned completely.
- A new toothbrush should be used after 24 hours.
- Complete the entire course of antibiotics or resistance to that antibiotic may occur.
- Symptoms that do not improve by 72 hours or get worse after 48 hours require a medical evaluation.
- Do not take any antibiotics that are lying around the house for a sore throat without visiting the health care provider. Antibiotics will invalidate a throat culture.

### **Questions to Ask Your Health Care Provider**

1. Is my sore throat related to a virus or a bacterium?
2. Do I need a culture to determine if there is a bacterial infection?
3. Which medications do you recommend to manage my symptoms?
4. Do you recommend any home remedies?
5. Will an antibiotic help my infection?
6. Are there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
7. When should I expect an improvement in my condition?
8. What complications should I look out for and how will they show up?

## Chapter 10: Allergies

Allergies affect the lives of 40 - 50 million Americans<sup>47</sup>. Allergies are associated with many other conditions and significantly affect quality of life. It is associated with frequent sinus and inner ear infection, sleep apnea, asthma and nasal polyps.

Quality of life is affected as those who suffer often have fatigue, hearing problems, impaired social function and impaired health perception. Children are affected by impaired learning, reduced social interaction and mental health problems<sup>48</sup>. Some of the treatments of allergic rhinitis can affect quality of life.

Allergies are a very common problem<sup>49</sup>.

- 25% of individuals suffer from allergies at some point in their life.
- More than 50% have the condition for greater than 11 years.
- Slightly less than 50% of those with allergies report symptoms for more than 2 seasons per year.
- In adults, men and women are equally affected.
- More women reported persistent allergies than men.
- In children, more boys are affected than girls.
- The average age of onset is 8-11 years old.

### Risk Factors

Many factors increase the risk of allergies.

- Maternal smoking
- Living in areas of high pollution
- Higher socioeconomic status
- Exposure to indoor allergens as a child
- Early introduction of food or formula as an infant
- Non-Caucasian race
- Genetics
- A family history of allergies, asthma and eczema increases the risk of allergies
- Personal history of asthma and/or eczema

### What will happen?

Allergies usually presents with:

- Clear runny nose
- Sneezing
- Nasal congestion
- Itchy eyes, nose and throat
- Frequent clearing of the throat
- Watery, red, swollen eyes
- Fatigue
- Headache

**Key questions for the allergy suffer to consider:**

- When did the symptoms start?
- How long have they been present?
- When are symptoms present (is there a seasonal pattern or do certain environments trigger symptoms)?
- How often do the symptoms occur?
- Are symptoms present all day or do they get better at some points during the day?
- Has there been any change in the environment that may be contributing to the symptoms (construction in the home/just started cutting the grass)?
- Which symptoms are most bothersome? This may help determine which treatment is most appropriate. Children sometimes present with only nasal congestion.

Symptoms of allergies can be bilateral or only affect one side. When one side is affected it is important to consider other possible diagnoses such as an object stuck in the nose (especially in a young child), nasal polyps, or a deviated septum.

**What is your trigger?**

Certain factors trigger allergies. Figuring out what triggers your symptoms will improve your ability to manage allergies. When you know what causes the allergies, you will know how to avoid that trigger. Sometimes it is not that easy. When one is allergic to grass pollen in the spring, the only way to completely avoid the allergen is to stay inside. This is not a practical strategy.

Those who are affected by allergens that cannot be avoided may need medications to control their symptoms. Common allergens to consider includes: mold spores, animals, grass, smoke, pollution and outdoor pollens.

Utilization of the [allergy chart](#) will help you get a handle on your allergies. By recording the severity of the symptom at the given time and what you were doing at that time can help you determine what triggers your allergies. The allergy chart does not need to be filled out everyday. I recommend filling out the chart for a couple of days and then studying the chart. This will help you get a handle on patterns of symptoms. Consider the questions listed above in regard to the allergy chart. If you notice that your allergy symptoms are most severe when you go outside to the local park, this may indicate that you are allergic to grass or tree pollens.

The second to last column is titled medications. This is a place to record when you take your medications. This will provide some explanation of how effective your medications are at managing your symptoms.

For example, if you notice that your symptoms are much improved for 4 hours after you take Benadryl, this indicates that Benadryl works well, but only for four hours.

### **What you look like**

Allergic patients have a characteristic look that a health care provider can pick up on. Many of them will be quite obvious to the non-medical person's eye.

They include:

- Clear, watery discharge from the eyes
- Red eyes
- Dark circles under the eyes
- Thin discharge from the nose, but thick discharge does not rule out allergies.
- A horizontal crease along bridge of the nose. This suggests that the patient has been rubbing his nose because of itching.
- Lines called Dennie-Morgan lines are noted below the lower eyelid.
- When a doctor looks at the patient's nose, the lining will be pale or have a bluish hue and there may be some swelling inside.

- The doctor may notice fluid behind the ear drums and a red throat with post-nasal discharge and enlarged tonsils.

### **Classification of allergies**

One method of classification of allergies is to break them down into perennial and seasonal.

- Perennial allergies are symptoms that occur throughout the year. They are usually brought on by a specific allergen or allergens in the home such as pets, mold, dust mites, cockroaches or rodents.
- Seasonal allergies take place during a specific time to a specific allergen. Tree pollen allergies are more common in the early spring and grass pollens are more common in the late spring and through out summer. Weed pollens cause most problems in the late summer and into the fall. Ragweed allergy commonly occurs in the fall. Dry, sunny and windy days are often associated with the highest pollen counts and with the worst symptoms. Outdoor molds are another source of allergic symptoms and can be agitated by gardening or digging.
- Some medications can induce allergic like symptoms including: aspirin, ibuprofen, estrogen and birth control pills.

Another way of classifying allergies is by intermittent versus persistent and mild versus moderate/severe.

- Intermittent allergies are symptoms less than four days a week or symptoms lasting less than 4 weeks.
- Persistent symptoms occur more than four days per week and symptoms last longer than 4 weeks.
- Mild symptoms do not interfere with sleep, daily activities, work or school and does not cause any troublesome symptoms.
- Moderate/severe symptoms are associated with at least one of the following: abnormal sleep, troublesome symptoms, problems at work or school or impairment in daily activities.

Symptoms can occur due a specific allergen in a specific environment. Some intermittent allergies may occur when:

- Entering a house with a pet

- When carpet is removed from the workplace
- Shortly after sex. Dust mites from the bed become airborne and may enter the respiratory tract

### **Other diagnoses to consider**

- Viral illness. The common cold is often confused with allergies ([see table](#)). While they have many similar symptoms, viral illnesses usually present with an abrupt onset of upper respiratory symptoms. Viral illnesses are often associated with a low-grade fever.
- Foreign body. The younger child with one-sided symptoms is more at risk for having an object in the nose.
- Sinus infection. Prolonged symptoms of nasal congestion may be a sinus infection. Rarely are sinus infections associated with sneezing and watery eyes.
- Non-allergic rhinitis. This occurs when there is exposure to irritants or weather changes. There is less itching and more postnasal drip.
- Rhinitis medicamentosa
- Hormonal rhinitis is often seen in pregnancy or hypothyroidism
- Nasal polyps
- Enlarged adenoid glands
- Tumors
- Nasal septal deviation

### **Testing**

Usually allergies are diagnosed on an examination from the doctor, but in some cases testing can be employed. The most common test is allergy skin testing. This involves the health care provider pricking the skin and introducing a small amount of allergen. If the skin reacts to the allergen, then there is an allergy, if not, no allergy.

The radioallergosorbent test (RAST) examines the blood to determine serum allergen-specific IgE levels. It is less helpful than skin tests, as it is not as sensitive, more expensive and limited in what it can test for. It tests for dust mites, pollens, molds and pet dander but less helpful for food, drugs or venom.

Skin testing is preferred to RAST because skin testing is more sensitive, less expensive and tests for more allergens.

### **Treatment**

Treating allergies is done in a stepwise pattern.

1. Environmental control
2. Medications
3. Allergy shots

If you know what triggers your allergies they can be controlled more effectively. This is another argument for allergy testing. Those who have had their allergies tested know what aggravates them and can avoid those factors. Lifestyle interventions are a mainstay in allergy avoidance.

### **Outdoor allergies**

- Remain indoors with doors and windows closed and the air conditioning on to cool the home if needed. While this is not practical all of the time, if you are sensitive to pollen, it is especially important on days with high pollen counts to remain indoors as much as possible.
- Monitoring pollen counts should be done by all patients with allergies to pollen. This can be done through multiple websites including: <http://www.pollen.com>.
- When driving, roll up the windows and use the air conditioner.
- High efficiency particulate air (HEPA) filters should be used on air conditioning units and heating vents. Air filters and air ducts should be cleaned regularly.
- Air-drying laundry out doors can increase the amount of allergens on the clothes, so use indoor methods to dry clothes.
- After being outside, bathing may help reduce the amount of pollen on the body.

### **Indoor allergies**

- Keep the bedroom as free of allergens as possible as this is the room that can most easily lead to problems.
- Wash the bedding every week in hot water.
- Vacuum the mattress.

- Place impermeable covers on the bed – such as plastic.
- Most furniture should be made of dust proof material such as wood, metal or plastic.
- Remove stuffed animals from the bedroom.
- No pets in the bedroom.
- Remove carpet from the bedroom and other rooms, if possible.
- If you use a rug, use one that is made of synthetic fiber.
- If allergy measures are maximized in the bedroom but not in other rooms, keep the door to the bedroom closed.
- No indoor plants (especially in the bedroom).
- Dehumidify the home.
- Control mildew and mold in the bathroom by reducing humidity and spraying the shower with a mold/mildew reducing product such as Lysol mildew.
- Use high-efficiency particulate air filters.
- When vacuuming or dusting wear a mask or get someone without allergies to do these tasks.
- Wash pets frequently.
- Brush pets outside.

## **Medications**

Often times lifestyle modifications and elimination of triggers are not enough to manage the disease and medications need to be used. It is important to have a solid handle on your symptoms as some medications work better for specific symptoms. Those with eye symptoms should be treated with allergy eye drops. Oral antihistamines can treat sporadic symptoms. Nasal congestion is best managed with decongestants and some prescription nasal sprays.

Medications typically do not work when they are not taken. Individuals with persistent disease need to be treated continually or symptoms will return.

[Oral antihistamines](#) are the most common initial treatment for allergies, mainly because of their availability and ease of use. Antihistamines treat runny nose, red watery eyes, sneezing and itching. They do not treat nasal congestion but many products come combined with decongestants.

Older antihistamines - chlorpheniramine (Chlor-Trimeton), diphenhydramine (Benadryl) and hydroxyzine (Atarax) - are associated with more side effects, particularly sedation, and are less commonly used when compared to newer medications. The most common over the counter first-generation antihistamine is diphenhydramine.

Second-generation medications have improved dosing schedules and are less commonly associated with sedation. There are five, [second-generation antihistamines](#) available. Multiple studies have demonstrated that cetirizine (Zyrtec) is the most potent second-generation antihistamine.

### **Other oral medications**

Leukotriene receptor blockers inhibit chemicals in the body that are responsible for allergies. This class of drugs is commonly used on those with asthma. The most popular drug in this class for the treatment of allergies is montelukast (Singulair). It can be used in children over two-years-old for seasonal allergies and over 6 months in those with perennial allergies. This class is not recommended as a first-line drug for allergies, but is often added on to those who have difficult to control allergies. Nasal corticosteroids sprays are more effective in managing allergy symptoms than leukotriene receptor blockers.

### **Nasal sprays**

Multiple types of nasal sprays are helpful in the management of allergies. Some may be more effective than others based on the presenting symptoms.

- Nasal saline
- Nasal corticosteroids
- Nasal antihistamines
- Nasal cromolyn

### **Nasal Saline**

Nasal saline is a frequently overlooked option for allergies. It removes factors that cause allergies and improves mucus clearance. Everyone who has allergies should use nasal saline.

Two primary types of nasal saline are normal saline and hypertonic saline. Hypertonic saline has a higher concentration of salt in it. It is hyped to be more

effective at drying the nose than normal saline. It also is more likely to cause a burning and stinging sensation when used.

### **Nasal corticosteroids**

[Nasal corticosteroids](#) are recommended as first-line treatment of moderate to severe persistent allergies. Immediate relief will not be noticed with them. Some benefit is usually appreciated by the fourth day of use and it may take a couple of weeks before full effects are noticed. They work by reducing the amount of inflammation in the nose. They are often combined with oral antihistamines, which will provide some immediate relief.

Ideally they should be started about two weeks before exposure to allergens. This may be hard to predict, but those individuals who have a predictable onset of allergies in the spring should start these medications two weeks before.

These medications manage itching, runny nose, nasal congestion and sneezing. In order to provide relieve they must be used regularly. They are not effective for symptoms in the eyes. Side effects include:

- Irritation
- Sneezing
- Nose bleeds
- Headache
- Fungal infections (rare)
- Perforated nasal septum (rare).

One side effect that warrants special attention is growth stunting in children. There is some evidence that there is some growth stunting with the use of nasal corticosteroids. Therefore, all children who take long-term nasal steroids should have their height measured every six months<sup>50</sup>. Some nasal corticosteroids – mometasone and fluticasone - have not shown a reduction in height<sup>51 52</sup>. Studies done with higher doses of corticosteroids in asthma demonstrated that growth stunting may be seen in children up to 1-2 cm but this does not affect adult height<sup>53</sup>.

### **Nasal Antihistamines**

Spraying antihistamines up the nose is another method to deliver medicine to the allergic patient. Topical antihistamines come in a product called azelastine

(Astelin). It is as effective for nasal symptoms as oral antihistamines. It works quickly and is dosed two puffs in each nostril twice a day.

A newer product called Astepro provides the same benefit but it lacks some of the side effects of the older version of azelastine. It has less of a bitter taste and less somnolence than Astelin. Topical antihistamines are effective at treating sneezing and runny nose. Different than the oral antihistamines, the topical antihistamines are effective at treating nasal congestion.

### **Nasal Anticholinergic**

Anticholinergic medication - ipratropium bromide (Atrovent nasal spray) – can also help dry a runny nose. This medication comes in two strengths 0.03 and 0.06 %. Only the 0.03% is indicated for allergic and nonallergic perennial rhinitis while the 0.06% is indicated for runny nose associated with the common cold. This medicine can be used in those over five and is dosed two sprays, 2 to three times a day.

### **Nasal Cromolyn**

Cromolyn sodium (Nasal crom) is an over the counter medication used in the management of allergic rhinitis. It requires frequent dosing and is given one puff per nostril every 4-6 hours. It is not as useful for immediate relief and it may take a week before benefit is realized. It is not as potent as nasal corticosteroids<sup>54</sup>.

### **Eye Symptoms**

When allergies affect the eyes, there are two ways to manage them. Take an oral antihistamine (all of which have systemic effects). Second, you may use eye drops to deliver the medication directly in the eye.

Some people are able to use saline eye drops to effectively manage their eye symptoms. Saline eye drops are just salt water that can help flush away allergens, but do not have any medication in them.

Many people with severe eye symptoms need medicated eye drops. Many products are a combination of antihistamines and mast cell stabilizers and effectively treat red, watery and itchy eyes ([see table](#)). For eyes that are inflamed and painful the use of ketorolac or a steroid eye drop may be helpful.

Over the counter medications are available for the treatment of allergic eye symptoms. Naphazoline pheniramine (Naphcon A/Opcon A) is a popular over the counter medication that is helpful in the reduction of eye symptoms.

Ketotifen (Zaditor) is an over the counter antihistamine eye drop. It is dosed one drop twice a day in children over three years old.

### **Stuffy nose**

Allergies are often accompanied by nasal stuffiness. Some of the medications already discussed can provide relief from nasal congestion – topical antihistamines and nasal corticosteroids. Effective and rapid relief from nasal congestion can be attained with decongestants.

Decongestants are dangerous in some people. Decongestants have the potential to increase the blood pressure, heart rate and make you feel jittery. Checking with your doctor or health care provider is important if you have high blood pressure, heart disease, heart rhythm problem, diabetes, thyroid problems, an enlarged prostate or glaucoma.

Many allergy medications combine decongestants and antihistamines. When you see the allergy medication with a “D” on the back, for example, Claritin D, this has a decongestant in it.

When your symptoms are a combination of sneezing, runny nose and watery eyes with nasal congestion, than the use of an allergy product with a decongestant will be most helpful in managing symptoms.

Decongestants come in a variety of forms ([see chart](#)). They can be taken orally, topically (as a nasal spray) and as a vapor.

#### *Severe symptoms*

In rare situation, doctors need to use oral corticosteroids. These are powerful anti-inflammatory medications and are used when symptoms are severe. They are typically given for less than 7 days. Allergic rhinitis is not an indication for long-term use of oral corticosteroids.

### **What should a patient do with allergies?**

When you come down with the hallmark symptoms of allergies – sneezing, watery eyes, runny nose and nasal congestion – what should you do?

1. The first thing to do is take an inventory of your symptoms. This is best accomplished by maintaining an [allergy log](#). With the use of this allergy log you can determine when your allergies are worst, which symptoms are most bothersome, what is aggravating them and how effective your treatments are at controlling the symptoms.
2. Attempt to eliminate any factors that may be making the allergies worse.
3. If this does not work, a trial of some over the counter medication is appropriate. The most popular and potent over the counter medication is cetirizine (Zyrtec). If you are plagued by congestion, the addition of decongestants may be helpful. Use caution with the decongestant part if you are affected by high blood pressure, heart disease, thyroid disease, heart rhythm problem, diabetes, prostate enlargement or glaucoma.
4. If symptom control is unsuccessful with over the counter medications, set up an appointment with your health care provider.
5. Continue to work on environmental control and track your symptoms.
6. If after a two or three appointments with your primary doctor your symptoms are not controlled than seeing an allergy specialist is recommended.

### **What the doctor will do?**

If environmental control and over the counter medications have not provided adequate relief than the health care provider may prescribe some of the other medications discussed above.

When this does not adequacy control symptoms than allergy testing or immunotherapy may be indicated.

The primary doctor will provide a complete evaluation and may decide on an earlier referral if other symptoms suggestive of a problem are evident. Certain conditions that would warrant evaluation by a specialist include:

- Nasal polyps which would be suggested by chronic congestion, runny nose, post-nasal drip and reduced smelling and/or taste
- One sided nasal congestion
- Persistent bloody discharge
- Complications of allergies such as recurrent sinus or ear infections

## **Immunotherapy**

Eighty to 90 percent of the cases of allergies can be managed with immunotherapy. Immunotherapy is considered when symptoms are not adequately managed with environmental control, over the counter medications and prescription medications. They can also be used by those who cannot tolerate or do not want to take long-term medications. It can also be used for those with severe disease.

Immunotherapy is effective, but the onset of effect is slow. It may take up to one year before significant effect is noticed. Therapy is often continued for up to five years. It is indicated for those over five-years-old. There is a risk of severe allergic reaction and you should only have this done in the office of a health care provider who has the ability to handle a severe allergic reaction.

It is useful in those who are allergic to dust mites, pollens and cats and not as effective for mold and dogs.

### **Questions to Ask Your Health Care Provider**

1. Which medications do you recommend to manage my symptoms?
2. Which environmental changes do you recommend?
3. Are there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
4. When should I expect an improvement in my condition?
5. What complications should I look out for and how will they show up?

## Chapter 11: Cough

Cough is a common malady that affects many people every year. Cough is a protective mechanism that helps the body get rid of things that do not belong in the respiratory tract. A cough is not a disease, but a symptom.

Productive cough is one that produces mucus. The mucus can come from the chest or from drainage from the nose or sinuses. A productive cough is good; it helps the body get rid of mucus. The cough should not be suppressed with medication unless it is causing significant interruption with sleep or extreme discomfort. Causes of productive cough include:

- Viral illness
- Bronchitis
- Sinus infections
- Allergies
- Pneumonia
- Tuberculosis
- Acid reflux
- Smoking

Non-productive coughs are dry and hacking and do not produce mucus. It can be caused by many of the same things such as viral infections, allergies, but can also be caused by asthma, some medications and a blocked airway.

Many of the other cases of cough were already discussed in this book. When cough is a primary symptoms and the cough is coming from the chest a common diagnosis is bronchitis. As an illustration of cough, bronchitis will be discussed.

### **Bronchitis**

Inflamed breathing passages, defines bronchitis. In bronchitis, the breathing tubes – known as the bronchi - become inflamed and red and have a reduced ability to clear mucus. Mucus starts to build up and blocks up the breathing passages.

Acute bronchitis is an infection that lasts less than three weeks and affects 12 million people every year. It is caused by multiple things, such as viruses, bacteria, parasites, and irritants such as pollutants or smoking.

Chronic bronchitis is a cough that lasts longer than 2 months and has been present over three separate years that has no other medical explanation. It is beyond the scope of this chapter to discuss chronic bronchitis.

### **Risk factors**

Certain factors increase the risk of bronchitis including:

- Lower socioeconomic status
- Male gender
- Race has no effect on risk

### **Other diagnosis to consider when you have a cough**

- Sinus infection
- Pneumonia
- Influenza
- Pharyngitis (sore throat)
- Acid reflux
- Allergies
- Congestive heart failure
- Asthma
- Croup (kids) – cough is barking and worse at night
- Bronchiolitis (kids)
- Pertussis (whooping cough)

### **Causes**

Multiple factors can lead to bronchitis, but the most common is a virus. Less commonly bronchitis is caused by a bacterium.

### **What to expect**

The most common symptom of bronchitis is cough. The cough does not produce mucus at first, but as bronchitis progresses the mucus may become thick and discolored. Those with bronchitis can cough for a long time after the infection. Cough lasts more than three weeks in about 1 of 4 people affected with acute bronchitis<sup>55</sup>.

Other signs and symptoms include:

- Fever
- Sore throat (often from irritation due to coughing)

- Runny nose
- Nasal congestion
- Fatigue
- Achy muscles
- Headache
- Burning in the center of the chest
- Wheezing
- Chest pain

Shortness of breath may occur in severe bronchitis but this usually only occurs in those who have an underlying lung problem such as chronic lung disease. Cyanosis – bluish color to the hands or lips – indicates severe disease.

### **What will the doctor do?**

After eliciting the history as outlined above the health care provider will perform an exam. He or she may find:

- Fever – usually low grade (less than 100.4 degrees Fahrenheit)
- Abnormal lung sounds
- Wheezing

Usually bronchitis is diagnosed after an interview and physical exam by a doctor. But, if after the exam the patient is deemed to be very ill or the diagnosis is uncertain further testing may occur. Checking the mucus for bacteria can be done. In addition testing to rule out other conditions may occur. Chest x-ray will rule out pneumonia. Blood work can help rule out or in a serious blood stream infection.

### **Red flags**

If any of the following factors are present than immediate evaluation should ensue.

- Chest pain
- Shortness of breath or difficulty breathing
- Bluish discoloration of the hands or around the lips
- Recent inhalation of any smoke, dust or chemicals
- Confusion
- Extreme sleepiness

- Stiff neck

## **Treatments**

Ninety percent of bronchitis cases are caused by viruses; therefore treatment with antibiotics is usually not warranted. Antibiotics do not treat viral infections.

When I see patients and I say the word “bronchitis”, they almost always think an infection that needs to be treated with an antibiotic. Some health care providers have suggested that the term bronchitis be replaced by “chest cold”. By changing the term from bronchitis to chest cold, people would get the impression that an antibiotic is not necessary. After all, colds go away without antibiotics and so do most cases of bronchitis.

Instead of antibiotics, a better strategy is to treat the signs and symptoms that are most troublesome to the patient. Cough suppressants reduce coughing and should be considered.

Cough suppression is a controversial topic in the management of chest infections. When there is cough that is interrupting sleep and reducing quality of life then cough suppression is helpful.

If cough is just a mild annoyance then suppressing cough may not be helpful and theoretically may be harmful. The cough is a protective mechanism that helps clear the respiratory tract. When cough is suppressed it leads to the possibility of mucus pooling in the lungs.

Over the counter products can suppress cough (see table 8). Dextromethorphan (Robitussin - DM) and Dextromethorphan polistirex (Delsym) are two products that can reduce coughing.

Expectorants are medications that loosen and help remove mucus from the respiratory tract. Guaifenesin is a common expectorant. It is found in such products as Mucinex and Robitussin. Mucus can also be cleared from the respiratory tract by increasing fluid intake and humidifying the respiratory tract with the use of a humidifier and taking steam showers.

[Pain relievers/fever reducers](#) should be considered if there is pain/discomfort or fever.

Bronchodilators – medicines that open up airways – help those who are wheezing with cough. While they are often prescribed, their effectiveness has

not been conclusively proven in the treatment of acute bronchitis. Studies do not clearly show a benefit over placebo<sup>56</sup>.

The benefits of antibiotics do not outweigh the risks in the treatment in most cases of acute bronchitis. While they may reduce the duration of the cough, the risk of side effects and drug resistance usually trump that benefit.

Most health care providers are well aware that bronchitis is not helped by antibiotics, but they are still prescribed. Antibiotics are prescribed for acute bronchitis about 80% of the time.

### **Which antibiotics should be used to treat bronchitis**

Bacterial bronchitis responds equally well to [macrolides, amoxicillin and cephalosporins](#). Amoxicillin is recommended as a first line medication for bronchitis if an antibiotic is needed.

Amoxicillin with clavulanate or quinolone antibiotics are much more powerful antibiotics but have not proven any more effective than the above medications and therefore not recommended as first line medications for bronchitis.

### **Complications**

Bronchitis usually is not associated with any major complications. It usually resolves without problem. Pneumonia can occur but only in about 5% of the patients.

Certain factors make pneumonia a much more likely diagnoses. The following factors would raise concern that pneumonia is present over a simple bronchitis<sup>57</sup>:

- High fever (above 38 degrees Celsius)
- Increased heart rate (above 100 beats per minute)
- Increased breathing rate (above 24 per minute)
- Cough that has persisted beyond three weeks

Pneumonia is an inflammation in the lung caused by microorganisms. It is one of the most common causes of death due to infectious disease.

A common statement I hear patients make is, "I probably should get on some antibiotics for my bronchitis so this doesn't go to pneumonia". It must be understood that, antibiotics do not prevent the onset of pneumonia in someone with bronchitis.

Pneumonia is heralded by a productive cough of thick discolored sputum, shortness of breath, increased heart or breathing rate, chest pain, fever and chills. Other symptoms that may be present include: headache, diarrhea, nausea, vomiting and feeling fatigued and wiped out.

Walking pneumonia is a less severe type of pneumonia. Its symptoms are often milder and the onset is more gradual than other types of pneumonia. Walking pneumonia is associated with a decrease in energy, headache, sore throat, runny nose and sometimes a fever.

It is usually not diagnosed right away, because it initially looks like a cold. It will get worse over a 2 week period. A cough will settle in the chest and symptoms may linger. Walking pneumonia is treated with antibiotics.

Cough often lingers after a bout of pneumonia or bronchitis, sometimes beyond 3 weeks. Hairs in the respiratory tract are killed off by the infection and new hairs will grow. This growth is thought to be one reason there is a cough after a bad chest infection.

### **Follow up**

Because complications can occur it is important to understand what the normal course of bronchitis is and what it is not. You should understand when you are to follow up with the health care provider. Follow up if any of the following occur.

- High fever
- Shortness of breath
- Persistent coughing
- Chest pain

Those individuals who get bronchitis often, should be evaluated for underlying conditions such as:

- Chronic bronchitis
- Allergies
- Acid reflux
- Lung cancer
- Asthma

As mentioned earlier, sometime a cough in bronchitis can persist. Persistent coughs are common, but may need an evaluation. A chest x-ray may be indicated to rule out pneumonia. Some patients require a round a corticosteroids to reduce swelling in the lung tissue which is a common cause of cough after bronchitis.

*Table 8: Selected over the counter expectorants*

**Mucinex** – Mucinex comes in a variety of formulations. Mucinex is guaifenesin, which can be taken 600 mg to 1200 mg every 12 hours. Plain Mucinex is purely an expectorant, which means that it helps remove mucus from the respiratory tract. The pill formulation of this medication is meant for those over the age of 12 and not recommended for those under 12. It should be taken with a full glass of water. The medication is an extended release tablet that should not be broken, chewed or crushed. It comes in a regular formulation and a maximum strength formulation. The regular formulation allows you to take one or two pills (600 mg per pill), whereas the maximum strength is the same medication but each pill is 1200 mg and you take one pill every 12 hours.

**Mucinex DM** is a combination production that combines guaifenesin with dextromethorphan. Dextromethorphan is a cough suppressant. Likewise, this medication should not be used in those under that age of 12. It also comes in a regular formulation and a maximum strength formulation.

**Mucinex D** is another combination product that combines guaifenesin with pseudoephedrine. This medication provides the expectorant along with a nasal decongestant. It can help not only rid the body of mucus but reduce nasal congestion.

**Robitussin** syrup is a shorter acting formulation of guaifenesin as it is dosed every 4 hours.

**Robitussin DM** syrup is a combination of guaifenesin and dextromethorphan. It is a combination expectorant and cough suppressant

**Robitussin CF** is a combination of guaifenesin, dextromethorphan and a nasal decongestant.

**Guaifenesin** comes as a generic formulation 400 mg - which is taken every 4

hours in the adult. A child between the ages of 6 and 11-years-old can take one-half of a tablet every 4 hours and it is not recommended for those under the age of 6.

*Mucinex comes in other formulations that are appropriate for children.*

**Mucinex oral solution** comes as guaifenesin 100 mg per 5 ml. It is used in those over the age of 4-years-old and is dosed 50-100 mg every four hours in the child 4-5-years-old; and in children 6-12-years-old it is given 100-200 mg every four hours. It comes in a variety of flavors including grape and berry. The Mucinex oral solution comes combined with a nasal decongestant in Mucinex Cold.

**Mucinex mini-melts** come in packages that contain 100 mg of guaifenesin.

Table 9: Cough Suppression

**Robitussin DM** is a product already discussed above. The DM component of the medication is dextromethorphan, which is the cough suppressant.

**Dextromethorphan polistirex** (Delsym) is an extended release suspension that provides cough suppression over 12 hours. It is dosed for those over 12-years-old 2 teaspoons every 12 hours; in those 6-12-years old, one teaspoon every 12 hours; and for those 4-6-years-old, ½ teaspoon every 12 hours.

### **Cough Medications and Kids**

Many of the medications given for cough suppression and as expectorants are indicated for children four and older. As of 2008, over the counter cough and cold medications are not labeled for those under the age of 4. Antihistamines, such as Benadryl, are not labeled for those under the age of 6.

As far as medication for coughs and colds, there is little evidence to prove their effectiveness in children. The use of over the counter medication for the treatment of coughs may not be any better than taking a sugar pill.

#### *Other treatments for cough*

- Cool-mist humidifier thins mucus. They should be run at night when there is a cough. Cleaning the humidifier regularly will reduce the amount of bacteria that grow in the humidifier.
- Encouraging the intake of fluids will help thin mucus and make it easier to get out. Liquids that are warm or at room temperature work the best. Stay away from fluids that are dehydrating such as caffeine or alcohol.

- Honey is an effective treatment for cough. Do not use honey in anyone under the age of one.
- Steam inhalation helps loosen mucus. Filling a sink up with hot water and inhaling the steam with a towel over the head may provide relieve. The addition of peppermint oil may help ease congestion.
- Chili peppers or other spicy foods may loosen mucus

### **Questions to Ask Your Health Care Provider**

1. Are my symptoms related to a virus or a bacterium?
2. What is the chance I have pneumonia?
3. Do I need an antibiotic?
4. Which medications do you recommend to manage my symptoms?
5. Is there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
6. When should I expect an improvement in my condition?
7. What complications should I look out for and how will they show up?

## Chapter 12: Summary

Hopefully this book gave you a good understanding of common illnesses. You are not licensed to practice medicine, but hopefully you have a better understanding of how treatment for common illness should occur.

Running to the doctor at the first sign of a sniffle, sneeze or cough is not the best strategy. Many times it will be a waste of time for both you and your doctor. There are times that the doctor should be consulted. Red flags should always be considered when you are sick.

Using monitoring, home remedies and the drug store will help you avoid many doctor visits.

An argument could be made for not taking medication to manage your symptoms when you are sick. Symptoms may be there in an attempt to heal the body. The bacteria or viruses that are causing the infection usually do not reproduce as well when fever is present. The runny nose is a method for getting rid of bacteria in the nose. Cough helps expel infection from the lungs. Fatigue is the body's way of telling you, you need rest.

In today's society, there is often too much to do. We need to feel better, and we need to get better now. There is no time for illness. Treating the symptoms that make us sick helps us get through the day and on with our life.

A large part of this book looked at the over use of antibiotics. Patients are strongly contributing to the worsening problem of antibiotic over prescription. Educated consumers, will not go into the doctor's office and demand or expect antibiotics. Hopefully, you have a better understanding when an antibiotic is necessary. Table 10 discusses some conditions when antibiotics are helpful.

It will often save a lot of time and expense, when you attempt to manage symptoms of illness associated with cough, sneeze, sniffle on your own before running to the doctor. To sum up what was discussed in this book, I would like to leave you with a [chart](#) that will sum up how to treat some common conditions.

*Table 10: Are antibiotics helpful?*

|  |                             |                        |
|--|-----------------------------|------------------------|
|  | Antibiotic probably helpful | Antibiotic not helpful |
|--|-----------------------------|------------------------|

|                  |                                      |   |
|------------------|--------------------------------------|---|
| Sore throat      | Strep throat                         | Most other causes of sore throat        |
| Nasal congestion | When symptoms persist beyond 10 days | When symptoms persist less than 10 days |
| Earache          | Some cases of inner ear infections   | Most inner ear infections               |
| Cough            | When pneumonia is present            | Most cases of bronchitis                |

## Epilogue

*Jenny is an 8-year-old girl who presents to her pediatrician's office with an earache. She has suffered with a cold for three days and was awoken last night with an earache. She has a low-grade fever that responded well to some over the counter ibuprofen*

*After a complete examination, the doctor diagnoses an ear infection and tells her to continue to take ibuprofen and gives her a prescription for some ear drops for the pain. She is told to come back to the office if there is no improvement or a worsening of symptoms over the next 48 to 72 hours.*

*Jenny is comfortable over the next two days while taking regular doses of ibuprofen. She stops the ibuprofen medication on day 2 and feels fine – no fever, no ear pain and her nasal congestion has cleared.*

Which future do you want? Do you want to have bacteria that are resistant to medications resulting in common infection becoming deadly? Or do you want a future, where patients have fewer doctor visits and antibiotics that work when they are needed?

I think the answer is obvious. American society cannot continue to go along as we are. If things do not change, the scenario described in the beginning of the book may become a reality.

Health care providers who have the authority to write prescriptions are trained when an antibiotic is needed and when they are not. There are times when the treating clinicians do forget the guidelines though.

Most of the time the clinicians do know the guidelines, but prescribe antibiotics anyways. Why? Multiple reasons have been proposed to that question including: wanting to satisfy their patients and thinking it would be easier to prescribe the antibiotic instead of explaining why one is not going to be helpful.

Above and beyond teaching clinicians the guidelines, clinicians need to be taught how to NOT prescribe antibiotics. This is not as easy as it sounds. Most clinicians refuse to admit that they over prescribe and will be resistant to training.

Health care providers need to talk to patients about the use of antibiotics and the difference between bacterial and viral infections.

Continuing education courses can also be developed to help with this. Unfortunately, pharmaceutical companies often fund continuing education courses and few pharmaceutical companies will want to fund continuing education courses based on not prescribing medications.

As a health care consumer, it is important to remember your role. You need to be an active health care consumer, know how to care for yourself, know when you need to go to the doctor, know when you do not need to go to the doctor and do not demand or expect antibiotics at health care visits.

**Antibiotic Table**

| Generic antibiotic name     | Brand name     | Side effects   | Common uses in the outpatient setting  |
|-----------------------------|----------------|--|--|
| <b>Penicillin</b>           |                |  |  |
| Penicillin Potassium        | V<br>Veetids   | GI upset, nausea, vomiting, diarrhea   | Strep throat   |
| Amoxicillin                 | Trimox, Amoxil | GI upset, nausea, vomiting, diarrhea   | Strep throat, sinus infection, bronchitis, ear infection   |
| Amoxicillin clavulanic acid | -<br>Augmentin | Diarrhea, GI upset, abdominal pain, rash, vomiting                                   | Sinus infections, pneumonia, some bronchitis, skin infections, ear infections, strep throat          |
| <b>Cephalosporins</b>       |                |  |  |
| <i>First Generation</i>     |                |  |  |
| Cephalexin                  | Keflex         | GI upset, nausea, diarrhea   | Skin infections, strep throat, some respiratory infections   |
| <i>Second generation</i>    |                |  |  |
| Cefaclor                    | Ceclor         | GI upset, nausea, diarrhea   | Respiratory infections, sinus infections, ear infections, skin infections, bronchitis                |
| Cefprozil                   | Cefzil         |  |  |
| Cefuroxime                  | Ceftin         |  |  |
| <i>Third generation</i>     |                |  |  |
| Cefdinir                    | Omnicef        | GI upset, nausea, diarrhea   | Multiple respiratory infections, skin infections, throat infections, ear infections, some pneumonias |
| Cefixime                    | Suprax         |  |  |
| Cefpodoxime                 | Vantin         |  |  |
| Ceftriaxone Injection       | -<br>Rocephin  |  |  |
| <b>Quinolones</b>           |                |  |  |
| Ciprofloxacin               | Cipro          | GI upset, headache, rash, dizziness  | Urinary tract infections, some respiratory infections  |
| Levofloxacin                | Levaquin       | Abdominal pain, drowsiness, nausea, vomiting, diarrhea, constipation and lightheaded | Urinary tract infections, sinus infections, pneumonia, some bronchitis, skin infections              |
| Moxifloxacin                | Avelox         | Nausea, vomiting, diarrhea, dizziness, headache                                      | Sinus infections, pneumonia, some bronchitis, skin infections  |

| Generic antibiotic name       | Brand name      | Side effects   | Common uses in the outpatient setting  |
|-------------------------------|-----------------|--|--|
| <b>Macrolides</b>             |                 |  |  |
| Erythromycin                  | Ery-tab, Eryped | GI upset, nausea, diarrhea   | Strep throat, respiratory tract infections   |
| Azithromycin                  | Zithromax       | Nausea, rash, abdominal pain   | Some pneumonias, bronchitis, ear infections, throat or tonsil infections                   |
| Clarithromycin                | Biaxin          | Nausea, abnormal taste, rash, headache   | Some pneumonias, bronchitis, sinusitis, and throat or tonsil infections                    |
| <b>Sulfa medications</b>      |                 |  |  |
| Trimethoprim-sulfamethoxazole | Bactrim         | Allergic reactions, rash, loss of appetite, diarrhea, nausea, itching, headache, vomiting, dizziness | Ear infections, urinary tract infections, chronic bronchitis with bacterial exacerbations  |
| <b>Tetracycline</b>           |                 |  |  |
| Doxycycline                   | Doryx, Monodox  | Nausea, sensitivity to sun, rash, tooth discoloration  | Some respiratory infections  |
| <b>Other</b>                  |                 |  |  |
| Clindamycin                   | Cleocin         | Diarrhea, nausea, rash, jaundice, renal dysfunction  | Infections of the respiratory tract and skin when other antibiotic are not able to be used |
| Metronidazole                 | Flagyl          | GI upset, metallic taste, headache, seizure, reduced appetite, constipation                          | Some respiratory infections, some gastrointestinal infections                              |

## Drug Interactions

| Drug A                  | Drug B                             | What could happen  | Notes   |
|-------------------------|------------------------------------|--|---|
| Antacid                 | Quinolone antibiotic, tetracycline | Decreased absorption of the antibiotic                         | Give antibiotic 2 hours before or 6 hours after the antacid   |
| Warfarin                | Antibiotic                         | Decreased or increased warfarin level                          | Doctor should watch INR (warfarin level)  |
| Warfarin                | NSAID, ASA                         | Bleeding   | Avoid use together  |
| Warfarin                | Tylenol                            | Bleeding   | Risk is not as great as NSAID, minimal risk with one or two doses but ideally should be avoided                             |
| Clarithromycin (Biaxin) | Statins                            | Increased statin level/muscle damage                           | Consider other antibiotics  |
| Quinolones              | Prednisone                         | Tendon Rupture   | Avoid use together, especially in older adults. Patient should watch for any muscle pain, swelling, or rupture of a tendon. |
| Antidepressants (SSRIs) | NSAID                              | Increased risk of bleeding                                     | Pt should watch for any increase in bleeding. APAP is a safer option for pain/fever control                                 |
| Theophylline            | Antibiotics                        | Increased levels of theophylline                               | Theophylline levels should be watched   |
| ASA                     | Some anti-seizure medications      | ASA may increase the amount of seizure medication in the blood | Levels of anti-seizure medication may need to be monitored and any signs or symptoms of toxicity need to be watched for     |

|  |  |   |  |
|--|--|---|--|
| NSAIDs   | Blood pressure medications called beta blockers (propranolol, metoprolol, atenolol)  | NSAIDs may decrease the ability of the blood pressure medications to lower the blood pressure | Blood pressure needs to be monitored or medications adjusted |
| Antihistamines   | Sedatives, anti-anxiety medications, sleeping pills and muscle relaxants   | May increase sedation   | Avoid use together   |
| Pseudoephedrine (Sudafed)  | Blood pressure medications   | Reduced effect of the high blood pressure medications   | Other methods to decongest the nose should be sought         |
| Dextromethorphan (Robitussin DM)   | Sedatives  | Increased sedation  | If used together monitor for sedation                        |
| <b>Antacid</b> – Tums, Roloids;<br><b>NSAID</b> – Non steroidal Anti-inflammatory drugs (ibuprofen, naproxen);<br><b>ASA</b> – Aspirin;<br><b>Quinolone antibiotics</b> (Ciprofloxacin (Cipro), levofloxacin (Levaquin), moxifloxacin (Avelox) | <b>SSRI</b> – Selective Serotonin Reuptake Inhibitors [antidepressants – sertraline (Zolft), citalopram (Celexa), fluoxetine (Prozac)]; <b>Statins</b> – cholesterol lowering drugs (simvastatin (Zocor), atorvastatin (Lipitor) | Sedatives – some anxiety medications and sleeping pills                                       |  |

### Pain Relievers and Fever Reducers

|                              | Brand names            | Dose  | Side effects   | Notes   |
|------------------------------|------------------------|---|--|---|
| <b>Acetaminophen</b>         |                        |   |  |   |
| Acetaminophen                | Tylenol                | 325 mg – 12 and older take 2 pills every 4-6 hours, children 6-11-years-old take 1 tablet every 4-6 hours | Few when used as directed for a short period of time | Overdose will affect the liver, do not use with alcohol; Is not an anti-inflammatory drug   |
| Acetaminophen extra strength | Extra strength Tylenol | 500 mg – 12 and older take 2 pills every 6 hours  | Few when used as directed for a short period of time |   |
| Liquid acetaminophen         | Liquid Tylenol         | see package for dosing  | Few when used as directed for a short period of time |   |
| <b>Ibuprofen</b>             |                        |   |  |   |
| Ibuprofen                    | Motrin                 | 200-400 mg every 6-8 hours as need for pain   | Stomach bleeding, upset stomach, abdominal bloating  | Do not use during the last 3 months of pregnancy; Use caution in those with bleeding problems, on a blood thinner, those with asthma, a stomach ulcer, high blood pressure, heart or kidney problems or those over 60 years old |
|                              | Advil                  | 200-400 mg every 6-8 hours as need for pain   |  |   |
| Liquid ibuprofen             |                        | see package for dosing  |  |   |

| Naproxen sodium |            |   |  |   |
|-----------------|------------|---|--|---|
|                 |            |   |  | Do not use during the last 3 months of pregnancy; Use caution in those with bleeding problems, on a blood thinner, those with asthma, a stomach ulcer, high blood pressure, heart or kidney problems or those over 60 years old |
| Naproxen sodium | Aleve      | 12-years-old and older – take one tablet (220 mg) every 8-12 hours, 2 pills may be taken for the first dose | Stomach bleeding, upset stomach, abdominal bloating, high blood pressure |   |
| Aspirin         |            |   |  |   |
| Aspirin         | Bayer      | Take as directed on the label   | Stomach bleeding, upset stomach, abdominal bloating                      | Do not use in children especially those with the flu, chickenpox or another viral illness   |
|                 | Ecotrin    |   |  |   |
|                 | St. Joseph |   |  |   |

## Children Dosing

| Drug                         | Weight in pounds | Single dose (in mg) |
|------------------------------|------------------|---------------------|
| Acetaminophen<br>10-15 mg/kg | 6 to 11          | ask doctor          |
|                              | 12 to 17         | ask doctor          |
|                              | 18 to 23         | ask doctor          |
|                              | 24 to 35         | 160                 |
|                              | 36 to 47         | 240                 |
|                              | 48 to 59         | 320                 |
|                              | 60 to 71         | 400                 |
|                              | 72 to 95         | 480                 |
|                              | 96 and over      | see adult dose      |
| Ibuprofen<br>7.5 mg/kg       | 6 to 11          | ask doctor          |
|                              | 12 to 17         | 62.5                |
|                              | 18 to 23         | 75                  |
|                              | 24 to 35         | 100                 |
|                              | 36 to 47         | 150                 |
|                              | 48 to 59         | 200                 |
|                              | 60 to 71         | 250                 |
|                              | 72 to 95         | 300                 |
|                              | 96 and over      | see adult dose      |

### Illness Comparison Chart

|                                 | Common Cold         | Flu                 | Allergy           | Sinus Infection              |
|---------------------------------|---------------------|---------------------|-------------------|------------------------------|
| Onset of symptoms               | Gradual             | Abrupt              | Variable          | Gradual                      |
| Fever/chills                    | Rare                | Common              | No                | Uncommon                     |
| Cough                           | Hacking, productive | Dry, non-productive | Sometimes present | Sometimes                    |
| Sneezing                        | Common              | Uncommon            | Common            | Rare                         |
| Runny nose                      | Common              | Common              | Common            | Rare                         |
| Nasal congestion                | Common              | Uncommon            | Common            | Common                       |
| Tiredness                       | Mild                | Severe              | Sometimes present | Sometimes present            |
| Sore throat                     | Common              | Sometimes present   | Sometimes present | Secondary to post-nasal drip |
| Achy muscles                    | Mild                | Severe              | No                | Uncommon                     |
| Headache                        | Mild                | Common              | Sometimes present | Common                       |
| Chest discomfort                | Mild                | Common              | Rare              | Uncommon                     |
| Itchy eyes                      | Rare                | No                  | Common            | No                           |
| Frequent clearing of the throat | Uncommon            | Uncommon            | Common            | Sometimes                    |
| Duration of symptoms            | 3-14 days           | 3-14 days           | Weeks             | Over 10 days                 |

## Symptoms Chart

| What is your symptom? | Helpful intervention   | Helpful medication | May be helpful               |
|-----------------------|--|--------------------|------------------------------|
| Sore throat           | Fluids, cool mist humidifier, salt-water gargles                 | Nasal saline       | Throat lozenges/sprays       |
| Stuffy nose           | Fluids, cool mist humidifier                                     | Nasal saline       | Decongestants                |
| Runny nose            | Fluids, cool mist humidifier                                     | Nasal saline       | Antihistamines               |
| Headache              | Rest, cool compress on the head                                  | APAP, NSAIDS       |                              |
| Fever                 | Fluids, dress in light clothes                                   | APAP, NSAIDS       | Sponge bath                  |
| Body aches            | Rest   | APAP, NSAIDS       |                              |
| Earache               | Warm wash cloth over the ear                                     | APAP, NSAIDS       | Decongestants                |
| Face/sinus pressure   | Fluids, warm wash cloth over the face                            | APAP, NSAIDS       | Decongestants                |
| Cough                 | Fluids, cool mist humidifier                                     | Nasal saline       | Guaifenesin dextromethorphan |
| Sneezing              | Avoid allergens  | Nasal saline       | Antihistamines               |
|                       |  |                    |                              |
|                       |  |                    |                              |
|                       |  |                    |                              |
|                       |  |                    |                              |
|                       | APAP - acetaminophen   |                    |                              |
|                       | NSAIDS - Non-steroidal anti-inflammatory medications (ibuprofen) |                    |                              |

## Antihistamines

| Medication                              | Dose   | Side effects  |
|---|--|---|
| <b>First-generation antihistamines</b>  |  |   |
| Diphenhydramine (Benadryl)              | For those 12-years-old and older take 25-50 mg every 4-6 hours; 6-11-years-old take 12.5 to 25 mg every 4-6 hours; not recommended for those under 6-years-old   | Sedation, constipation, blurred vision, dizziness, difficulty urinating, can cause excitability in kids                     |
| Chlorpheniramine (Chlor-Trimeton)       | For those 12-years-old and older take one tablet (4 mg) every 4-6 hours as needed; 6-11-years-old take one-half tablet every 4-6 hours as needed, not recommended under 6-years-old  | Sedation, constipation, blurred vision, dizziness, difficulty urinating, can cause excitability in kids                     |
| Hydroxyzine (Atarax)                    | For those 12-years-old and older take 25 mg four times a day; for those between 6-11 years-old take 50-100 mg divided 3 to 4 times a day   | Sedation, constipation, blurred vision, dizziness, difficulty urinating, can cause excitability in kids                     |
| <b>Second-generation antihistamines</b> |  |   |
| Cetirizine (Zyrtec)                     | 5-10 mg orally every day for those over 6-years-old; for those 6-months and older it is indicated for perennial allergic rhinitis - and the dose is reduced to as low as 2.5 mg for those between the ages of 6-months and 5-years-old.  | Sedation and it is therefore dosed at night. It also can cause diarrhea, dry mouth, nervousness and insomnia                |
| Levocetirizine (Xyzal)                  | Dosed between 2.5-5 mg orally every day – typically at night. It is indicated for individuals six-years and older.   | Sedation, fatigue, dry mouth, sore throat. Kids may have fever, cough and bloody nose                                       |
| Fexofenadine (Allegra)                  | Dosed 60 mg orally twice a day or 180 mg orally once a day for the adult. It is indicated for those 6-years-old and older, and those 6-11-years-old are dosed 30 mg orally twice a day. It comes as an oral suspension for children under 6 and it can be given to those as young as 6-months-old. | Headache, GI upset, sinusitis, cough, fever, pain, drowsiness, and upper respiratory infection.                             |
| Loratadine (Alavert, Claritin)          | Dosed as 10 mg in the adult once a day. Loratadine is for those over 2-years-old with seasonal allergies   | Headache, sleepiness, fatigue, dry mouth, Kids may show: cold symptoms, wheezing, nervousness, abdominal pain               |
| Desloratadine (Clarinx)                 | Dosed 5 mg once a day and remains available by prescription only. Desloratadine is indicated for those over six-months if afflicted with perennial allergies or chronic idiopathic urticaria and over the age of 2-years-old with seasonal allergies.  | Sore throat, dry mouth, sleepiness, muscle aches, nausea, dizziness, kids may show fever, diarrhea, cough and cold symptoms |

## Nasal Corticosteroids

| Nasal Corticosteroids       |  |   |
|-----------------------------|--|---|
| Fluticasone (Flonase)       | Adults: 1-2 sprays in each nostril once a day or one spray twice a day. Children 4-11-years-old: Start with one spray in each nostril once a day, may increase to 2 sprays in each nostril every day | Headache, bloody nose, burning nose, sore throat, nausea, cough, may decrease growth in children  |
| Mometasone (Nasonex)        | Adults: 2 sprays in each nostril once a day. Children 2-11-years-old: one spray once a day   | Headache, bloody nose, cough, sore throat, pain, sinus infection, may decrease growth in children |
| Budesonide (Rhinocort Aqua) | Adults: 1-4 sprays in each nostril each day. Those 6-11-years-old: 1-2 sprays each nostril once a day  | Headache, bloody nose, burning nose, sore throat, nausea, cough, may decrease growth in children  |

## Allergy Eye Medications

| Drug   | Dosage  | Use  | Side Effects  | Note   |
|--|---|--|---|--|
| Olopatadine (Patanol) 0.1% ophthalmic solution | One drop in each eye twice a day for those over the age of 3  | Reduces eye itching and watery eyes  | Headache, blurred vision, stinging eyes, swollen eyes, sore throat, runny nose  | Prescription antihistamine and mast cell stabilizer      |
| Azelastine (Optivar) 0.05% ophthalmic solution | One drop in each eye twice a day for those over the age of 3  | Reduces eye itching may help with pain.  | Burning eyes, headache, blurred vision, bitter taste  | Prescription antihistamine and mast cell stabilizer      |
| Loteprednol etabonate (Alrex)                  | One drop in each eye four times a day   | Seasonal allergic conjunctivitis   | Blurred vision, itching, dry eye, burning, photophobia, sore throat, runny nose, earache. Prolonged use can have serious side effects | Prescription steroid that should be used very cautiously |
| Ketorolac (Acular)                             | One drop four times a day in those over 3   | Reduces eye itching may help with pain.  | Stinging, burning, swelling of the eye,   | Prescription anti-inflammatory eye drop                  |
| Naphazoline pheniramine (Naphcon A/Opcon A) is | Indicated for those over the age of 6 and is available over the counter and is usually dosed 1-2 drops four times a day | Treats red and itchy eyes due to allergies                                     | Headache, stinging, burning, swelling of the eyes   | Over the counter antihistamine and mast cell stabilizer  |
| Ketotifen (Zaditor)                            | One drop in each eye twice day for those over the age of 3. It is available over the counter                            | Treats red and itchy eyes due to pollen, grass, animal hair/dander and ragweed | Eye redness, stinging, burning, headache, runny nose  | Over the counter antihistamine                           |

## Decongestants

| Medication                     | Dose   | Uses                             | Side effects   | Cautions  |
|--------------------------------|--|----------------------------------|--|---|
| <b>Oral decongestants</b>      |  |                                  |  |   |
| <b>Pseudoephedrine</b>         |  |                                  |  |   |
| Sudafed (Standard formula)     | Adult 30-60 mg every 4 to 6 hours                | Nasal congestion, sinus pressure | Increased heart rate, increased blood pressure, nervousness, insomnia, dizziness | High blood pressure, heart disease, thyroid disease, diabetes, prostate disease |
|                                | 6-11-years-old – 30 mg every 4-6 hours           |                                  |  |   |
|                                | Under 6 – not recommended                        |                                  |  |   |
| Sudafed 12-hours               | 120 mg every 12 hours in those over 12-years-old |                                  |  |   |
| Sudafed 24-hours               | 240 mg every 24 hours in those over 12-years-old |                                  |  |   |
| Pseudoephedrine liquid         | 6-11-years-old - 30 mg of liquid every 4-6 hours |                                  |  |   |
|                                | 4-5-years-old - 15 mg of liquid every 4-6 hours  |                                  |  |   |
|                                | Under 4 years-old not recommended                |                                  |  |   |
| <b>Phenylephrine HCl</b>       |  |                                  |  |   |
| Sudafed PE (Phenylephrine HCl) | 12-years-old and older use 10 mg every 4 hours   | Nasal congestion, sinus pressure | Increased heart rate, increased blood pressure, nervousness, insomnia, dizziness | High blood pressure, heart disease, thyroid disease, diabetes, prostate disease |
|                                | Under 12-years-old - not recommended             |                                  |  |   |
| Pseudoephedrine PE liquid      | 6-11-years-old use 10 mg every 4 hours           |                                  |  |   |
|                                | 4-5-years-old use 5 mg every 4 hours             |                                  |  |   |
|                                | Under 4-years-old - not recommended              |                                  |  |   |

| Medication           | Dose   | Uses | Side effects   | Cautions  |
|----------------------|--|------|--|---|
| Topical nasal sprays |  |      |  |   |
| Oxymetazoline HCl    |  |      |  |   |
| Afrin                | Over 5-years-old use 2-3 sprays every 12 hours   |      | Temporary stinging, burning, sneezing, nasal discharge | Do not use topical decongestants more than three days |
| Dristan              | Over 11-years-old use 2-3 sprays every 12 hours  |      |  |   |
| Phenylephrine        |  |      |  |   |
| Neo-syneprine        | Over 11-years-old use 2-3 sprays every 12 hours  |      | Temporary stinging, burning sneezing, nasal discharge  |   |
| Vapor nasal sprays   |  |      |  |   |
| Levmetamfetamine     |  |      |  |   |
| Vicks inhaler        | Over 11-years-old use 2 inhalations each nostril |      | Temporary stinging, burning sneezing, nasal discharge  |   |
|                      | 6-11-years-old use one inhalation each nostril   |      |  |   |
|                      | Under 6-years-old – not recommended              |      |  |   |

## Cold Kit

|                                    | Over 12-years-old                         | 6-11-years-old           | 4-6-years-old                        | under 4              |
|------------------------------------|---|--------------------------|--------------------------------------|----------------------|
| Cool mist humidifier               | Any brand                                 | Any brand                | Any brand                            | Any brand            |
| Nasal saline                       | Nasal rinse                               | Simple saline mist       | Little noses saline spray/drops      | Baby simply saline   |
| Nasal suction bulb                 | No  | No                       | Any brand                            | Any brand            |
| Pain/fever reducer - ibuprofen     | Advil - 10 count                          | Chewable Advil           | Liquid Advil                         | Advil infant drops   |
| Pain/fever reducer - acetaminophen | Tylenol - 10 count                        | Chewable Tylenol         | Liquid Tylenol                       | Tylenol infant drops |
| Nasal decongestant - oral          | Sudafed - 12 hour                         | Sudafed liquid           | Sudafed liquid                       | No                   |
| Nasal decongestant - topical       | Afrin nasal spray                         | Afrin nasal spray        | Little noses decongestant nose drops | No                   |
| Nasal decongestant - vapor         | Vicks (if you cannot use oral or topical) | No                       | No                                   | No                   |
| Antihistamine                      | Benadryl                                  | Chewable/liquid benadryl | No                                   | No                   |
| Expectorant                        | Mucinex                                   | Mucinex - mini melts     | Mucinex mini-melts                   | No                   |
| Cough suppressant                  | Delsym                                    | Delsym                   | Delsym                               | No                   |
| Throat lozenge                     | Chloraseptic                              | Halls Breezers           | Chloraseptic spray                   | No                   |
| Nasal strip                        | Breath Right                              | Breath Right Kids        | Breath Right Kids                    | No                   |

## Sore Throat Products

**Chloraseptic spray** contains phenol 1.4% which is an oral anesthetic/analgesic. It can be used for those 3-years-old and older. It is to be sprayed and held in place for 15 seconds and then spit out. It can be used up to every 2 hours. Five sprays for those over 12-years-old and three sprays for those 3-12-years-old.

**Chloraseptic max** combines Phenol 1.5% and glycerin 33 % which is a demulcent.

**Halls Breezers** contain 7 mg of pectin, which is an oral demulcent. They are meant for adults and children 5-years-old and older.

**Sucrets** contain dyclonine hydrochloride 2.0 mg which is an oral anesthetic. It is indicated for those 6-years-old and older and can be repeated every 2 hours, no more than 10 per day.

**Cepacol** contain benzocaine 15 mg (oral anesthetic) plus menthol 3.6 mg oral analgesic. Can be given to those 5-years-old and older and repeated every 2 hours.

**Cepacol** (sore throat and cough) has 7.5 mg of benzocaine and 5.0 mg of dextromethorphan hydrobromide (cough suppressant). Individuals over 12-years-old should take 2 lozenges every 4 hours (max 12 lozenges in 24 hours); individuals 6-12-years-old should take one every four hours (max 6 lozenges in 24 hours). It should not be used in those under 6-years-old.

**Cepacol** (sore throat and coating relief) combines a benzocaine 15 mg and pectin 5.0 mg and can be used every 2 hours in those over the age of 5-years-old.

**Tylenol cough and sore throat** combines an oral liquid that contains acetaminophen (Tylenol) and Dextromethorphan. Nothing in the medication directly works on the throat, but acetaminophen is a general pain reliever that will provide some relief and the liquid may provide an very temporary rush of relief.

## Outer Ear Infection Medications

| Medication   | Dose   | Note  |
|--|--|---|
| Bacterial infection                                    |  |   |
| Acetic acid/propylene glycol/hydrocortisone (VoSol HC) | 5 drops three to four times a day for adults and 2-3 drops 3-4 times a day for kids                            | Can be irritating to the ear  |
| Hydrocortisone/polymyxin/neomycin                      | 4 drops for adults and 3 drops for pediatric patients 3-4 times a day  | Should not be used if there is a tear in the ear drum. Neomycin is irritating to the skin.        |
| Ofloxacin (Floxin otic)                                | 10 drops twice a day for adults and 5 drops twice a day for those between 6-months to 13-years-old for 7 days. | This is an antibiotic ear drop, that does not have a steroid; can be used in those with ear tubes |
| Ciprofloxacin/hydrocortisone (Cipro HC otic)           | 3 drops twice a day for those over the age of one  | Should not be used if there is a tear in the ear drum.  |
| Ciprofloxacin/dexamethasone (Ciprodex Otic)            | 4 drops twice a day for those over the age of 6 months.  | OK to use in those with ear tubes or a tear in the ear drum.                                      |

## Allergy Chart

| Time  | Sneezing | Runny nose | Nasal congestion | Sore throat | Red, itchy, watery eyes | Fatigue | Headache | Medications | Activity |
|-------|----------|------------|------------------|-------------|-------------------------|---------|----------|-------------|----------|
| 6     |          |            |                  |             |                         |         |          |             |          |
| 7     |          |            |                  |             |                         |         |          |             |          |
| 8     |          |            |                  |             |                         |         |          |             |          |
| 9     |          |            |                  |             |                         |         |          |             |          |
| 10    |          |            |                  |             |                         |         |          |             |          |
| 11    |          |            |                  |             |                         |         |          |             |          |
| 12    |          |            |                  |             |                         |         |          |             |          |
| 1     |          |            |                  |             |                         |         |          |             |          |
| 2     |          |            |                  |             |                         |         |          |             |          |
| 3     |          |            |                  |             |                         |         |          |             |          |
| 4     |          |            |                  |             |                         |         |          |             |          |
| 5     |          |            |                  |             |                         |         |          |             |          |
| 6     |          |            |                  |             |                         |         |          |             |          |
| 7     |          |            |                  |             |                         |         |          |             |          |
| 8     |          |            |                  |             |                         |         |          |             |          |
| 9     |          |            |                  |             |                         |         |          |             |          |
| 10    |          |            |                  |             |                         |         |          |             |          |
| night |          |            |                  |             |                         |         |          |             |          |

Rate the severity of the symptoms

0 - none; 1 - mild; 2 - moderate; 3 severe; 4 - unbearable

## Acute Visit Form

Doctor seen: \_\_\_\_\_ Date: \_\_\_\_\_

Reason for the visit: \_\_\_\_\_

Symptom

Describing information

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Diagnosis: \_\_\_\_\_

### **Treatment Ordered**

*Medicine name:* \_\_\_\_\_

How to take it: \_\_\_\_\_

Side effects: \_\_\_\_\_

How to follow up: \_\_\_\_\_

*Medicine name:* \_\_\_\_\_

How to take it: \_\_\_\_\_

Side effects: \_\_\_\_\_

How to follow up: \_\_\_\_\_

*Medicine name:* \_\_\_\_\_

How to take it: \_\_\_\_\_

Side effects: \_\_\_\_\_

How to follow up: \_\_\_\_\_

Other Treatments: \_\_\_\_\_

\_\_\_\_\_

Recommended Testing:

\_\_\_\_\_

Follow up

When should I be seen back in the office: \_\_\_\_\_

Under what circumstances should I call you?

\_\_\_\_\_

\_\_\_\_\_

What type of information can I gather to help you with your evaluation?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## **Acute visit describing information**

This section will describe what important information you need to report to your health care provider for a variety of common conditions.

### **Cough**

When did it start?

Is the cough dry or moist?

Is the cough productive or non-productive?

When is it worse (morning/night)?

What is the color of the sputum?

Does the color clear as the day progresses?

Is the mucus thick or thin?

Is there any wheezing?

Is there any shortness of breath, fever, chills, poor appetite, muscle aches, chest pain or burning in the chest?

Are you short of breath when you are lying down?

### **Headache**

When did it start?

Where is it located?

How long has the pain lasted? Is it constant or does it come and go?

Describe the pain (sharp, dull, numb, band-like, pulsating, etc?)

What makes the pain worse or better?

How severe is the pain? Use the 0-10 scale.

Are there any other symptoms (nausea, vomiting, neck pain, dizziness, numbness, visual changes, eye tearing, nasal congestion, etc.)?

### **Runny nose**

When did it start?

Describe the discharge?

Is the discharge thin/thick?

Is there a small, medium or large amount of discharge?

What is the color of the discharge?

Is there any nasal congestion?

Is there any facial pressure?

Are there any other symptoms (cough, sneezing, itchy eyes or itchy nose, sore throat, earache, fever, headache, body aches, etc)?

### **Sore throat**

When did it start?

Are there any other symptoms (fever, runny nose, cough, sneezing, itchy eyes or itchy nose, headache, nausea or eye discharge)?

Has there been a change in your appetite?

Is there any drooling or difficulty swallowing?

How severe is the pain? Use the 0 to 10 scale.

### **Earache**

When did it start?

Did it come on fast?

Has there been a recent cold?

Is the ear pain interrupting sleeping or affecting daily activities?

How severe is the pain? Use the 0-10 scale.

Is it a deep pain?

Are there any hearing changes?

Is there a feeling of fullness?

Are the ears popping?

Does it come and go or is the pain constant?

### **Fever**

When did the fever start?

How high has the fever been?

What treatments have you tried?

How effective have treatments been in bringing the fever down?

What are the accompanying symptoms (sore throat, stuffy nose, cough, earache, body aches, headache, loss of appetite, chills, sweating or weakness)?

## Question Form

This is a form for you to record a list of questions you want your health care provider to answer. Report the questions in order of importance. The most important question that you want answered should be number one. Realize that you may not get to all of your questions during the office visit. Make one copy for you and one for your health care provider.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_
5. \_\_\_\_\_  
\_\_\_\_\_
6. \_\_\_\_\_  
\_\_\_\_\_
7. \_\_\_\_\_  
\_\_\_\_\_
8. \_\_\_\_\_  
\_\_\_\_\_
9. \_\_\_\_\_  
\_\_\_\_\_
10. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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