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## LIVING WITH EMPHYSEMA

Many of us know someone who is living with emphysema. It's the fourth leading cause of death in the US, but a diagnosis of emphysema is not a death sentence. It is a progressive condition that requires that a patient take an active role in managing and controlling the progression of the disease. As we age, we all experience a natural decrease in lung function. Most never notice the decrease unless they exercise heavily. Exercise increases the body's demand for oxygen and, if there is a limit to how much oxygen can be delivered, the result is hypoxia. This condition is characterized by the lips and fingernails taking on a bluish color. When a person with emphysema exceeds the limit of their lungs to oxygenate blood, the resulting deficit can be long-lasting even if physical activity is stopped immediately, so it's important for patients to avoid strenuous activity until they can determine their own limits safely and under the supervision of a doctor. Emphysema is included in a group of diseases called chronic obstructive pulmonary disease or COPD.

The function of the lungs is to provide an extensive surface area for the exchange of gasses between air and the blood. The walls of the alveoli are only one cell thick. The spaces between the alveoli are filled with capillaries and elastic fibers. Since both oxygen and carbon dioxide are lipid soluble and the cell structures are made of lipids and proteins, gasses transfer freely through the walls of the alveoli to the blood and back. In the case of emphysema, the physical structure of the spongy lung tissue is changed. Imagine the way foam forms when filling a sink of soapy water. At first, the foam is made of lots of little bubbles clumping together but not many large bubbles. As the water drains from the foam back into the sink due to gravity, the soapy water barrier between the bubbles gets progressively thinner until tiny bubbles begin to merge forming larger bubbles. The process continues until all of the bubbles have merged and popped. The same thing happens to the alveoli when they become damaged due to smoking, inhalation of debris, or genetic defect.

In addition to the physical structure of the lungs being damaged, there is another problem that can contribute to emphysema. The alveoli are soft tissue that is well-hydrated but water's surface tension is too high to allow such tiny pockets of air to remain open. To address this problem, the walls of the alveoli produce a surfactant that lowers the surface tension of water so it spreads thinly against the walls of the alveolus. This thin layer of water and surfactant prevents the walls of the alveolus from sticking together when you exhale. Smoking and other factors can destroy the lung's ability to produce this surfactant. If this happens, the walls of the alveolus stick together and require extra inhaling force to pop them open. So in addition to some of the alveoli merging into larger sacks, others stick closed on exhaling making breathing more labor-intensive. Patients can become easily exhausted by the extra effort it...

...takes to breathe. The extra effort raises the demand for oxygen while at the same time decreasing the amount of oxygen being transferred to the blood.

So why is it so bad when alveoli join together? When two alveoli are healthy and separate, the surface area includes the wall between them. If two alveoli merge as in emphysema, the total surface area decreases by twice the area of the wall between them that was lost. When many alveoli join together, the surface available for oxygen transfer decreases rapidly even though the total volume of air in a breath can remain about the same. The possibility of lung infections often increases as the disease progresses because some areas of the lung may be cut off from the outside during this process providing bacteria with a safe haven in which to multiply.

Drugs like albuterol (Proventil or Ventolin) are often used to decrease irritation and inflammation in the lungs to ease breathing. Portable oxygen concentrators are now available that increase the amount of oxygen you inhale without the need to carry heavy oxygen tanks around. They're expensive, but for milder cases of emphysema, they can improve quality of life and reduce exertion. Making sure to understand emphysema can actually give you better control over the disease. Panic stemming from the onset of shortness of breath often causes people to increase the effort of breathing making the attack worse. If a patient can lie back and relax, take slow deep breaths, and try to reduce their heart rate, the attack will subside. As a precaution, be sure to always have the means to call for help without being able to speak. Here's where cellphones come in handy. Most cellphones can send and receive text messages. Though you may not use this feature often, learn how it works and practice it a few times so that if you have an attack that does not subside you can still contact a friend without being able to speak. Make sure your friend knows about your condition and your first distress message should include your location so that if you lose consciousness they can find you or send an ambulance.

Stop smoking. That was for everyone, not just those with emphysema. A large portion of the damage caused by smoking is cumulative. Every pack of cigarettes brings you one step closer to lung problems. Even if you already have emphysema or some other form of COPD, stopping smoking can often halt the progression of disease and sometimes even result in some improvement.

Fundamentals of Anatomy & Physiology, 2009, Frederic H., Ph. D., Judi L. Nath, Ph. D., 8th Ed., Benjamin Cummings.

WebMd.com, Author: Christopher J Ware, MD, Staff Physician, Department of Emergency Medicine, Temple University School of Medicine. Coauthor(s): Joseph S Bushra, MD, FAAEM, Adjunct Assistant Professor of Emergency Medicine, Temple University School of Medicine Philadelphia, PA, Attending Physician, Department of Emergency Medicine, The Lankenau Hospital Wynnewood, PA., October 26, 2005

- W. T. Loesch III, Vice-President

## RECOGNIZING THE WARNING SIGNS OF STROKE

Stroke is a frightening subject on the minds of many of us as we age. Though it can happen at any age, stroke most often occurs in the elderly, those in already poor health, and those with multiple risk factors. Risk factors for stroke include age, family...

...history, male gender, prior stroke or heart attack, high blood pressure, smoking, diabetes mellitus, artery disease, atrial fibrillation, sickle cell anemia, high cholesterol, poor diet, obesity, sedentary lifestyle, geographic location, socioeconomic status, alcohol abuse, and drug abuse.<sup>(i)</sup> For a description of each risk factor visit the American Heart Assoc.'s website at [www.americanheart.org](http://www.americanheart.org) and search for "stroke risk factors." The key to reducing the effects of a stroke is to take action before the damage becomes permanent. In order to make this happen quickly, you must be prepared before a stroke occurs. If a stroke occurs before you have prepared for it, there is a greater likelihood for delays in treatment.

The simple definition of a stroke is the death of a region of the brain most often due to loss of blood flow. It's not quite that simple. Because different regions of the brain govern different body functions, the location of the stroke determines what symptoms will be experienced but all of these symptoms have one thing in common. They are sudden and usually easy to recognize. Let's say that a blood clot has formed somewhere in the circulatory system and is traveling around the body. If it lodges in the lungs, that's bad. It's called a pulmonary embolism and can be life-threatening. If it lodges in the brain, it's even more serious. Most cells in the body keep some energy reserves. If you apply a tourniquet to your arm, it does not immediately become useless. You can still move your fingers for a long time after blood flow has been cut off. This is not true with the brain. Neurons (brain cells) do not store much energy so when their supply of blood sugar or oxygen is cut off it doesn't take long before the symptoms become apparent.

There are four major arteries keeping the brain supplied with oxygen so it's unlikely that a clot will significantly reduce blood flow to the whole brain, but a small clot lodged in a smaller arteriole can very quickly starve all of the neurons behind the blockage. The neurons quickly shut down and whatever body function they are serving basically stops. For example, if a clot lodges somewhere in the visual cortex, a sudden change in vision such as sparkly vision, distorted images, or dark areas in the field of vision will happen very quickly. The thing to remember is that whatever the symptoms are, they almost always occur suddenly. Sometimes a change in motor control or a severe headache or even sudden confusion can occur if a clot blocks another area serving one of those functions. If you notice a sudden change in function like this, don't panic, but also, don't wait to seek medical care. If you suspect you are having a stroke, call 911 immediately and stay on the line. It may be difficult to speak but if you can get the word "stroke" out they will know exactly what to do. Stay on the line so they can find you. Here's where a lack of privacy is a good thing. They can trace the signal coming from your phone, even some cell phones can be located to within a very small area. If possible, make sure someone else close by knows you're in trouble, but don't panic. Panic can make the damage caused by the blockage worse.

Once at the hospital, drugs are usually administered or a surgical procedure performed to relieve the blockage. This is always done on an emergency basis because time is critical. The longer the cells behind the blockage are starved for oxygen...

...and glucose the more lasting the damage will be. To get medical care quickly, be prepared. If you are in poor health, a smoker, elderly, or living alone, take steps to ensure that you can get a message through to someone even if you are impaired. Put a neighbor's phone number on speed dial and stay in close contact with that person if you are at high risk. There are great services now like LifeAlert® (lifealert.net) that are reasonably priced and can get medical care to you very quickly.

-W. T. Loesch III, Vice-President

i) American Heart Association,  
<http://www.americanheart.org/presenter.jhtml?identifier=3053>

### FEATURED PRODUCT

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## THE IMPORTANCE OF SLEEP

For a long time, I thought of sleep as a waste of time. I'm a workaholic, so my assumption was that the more time I spent awake the more I could accomplish. I was always sleepy and it seemed I was always overworked. Staying up late working made it very hard to get up early so it wasn't long before my sleep cycle had stretched out to a 30 hour day. When my schedule was flexible, that was ok, but in my late thirties I guess age caught up with me. I just can't pull all-nighters like I used to. It took a while but I finally realized that I was cheating myself out of productivity and creativity. Here's why.

The sleep cycle is governed by three neurotransmitters produced in the sleep center of the brain. When we wake up in the morning, serotonin and dopamine levels are low and norepinephrine levels are high. During the day, this balance changes. More and more norepinephrine is "lost" and serotonin and dopamine levels rise. The ultimate effect is that after about 18 waking hours, so much serotonin and dopamine have built up that we feel drowsy and our higher mental functions begin to shut down leading to sleep. During sleep, the process is reversed until norepinephrine levels are high enough and serotonin levels are low enough that we spontaneously wake up. This cycle happens whether we fight to stay awake or not so what ends up happening is that we lose the first couple hours of very deep sleep normally associated with the start of a sleep period and only get the more shallow sleep patterns until we wake up. The number of hours of sleep may be the same, but the depth of the sleep has been reduced. Over time, this can build up to what we call a "sleep debt." Your body needs a certain amount of sleep. This amount does not come from some website or medical group telling you what you need; it comes from your brain. Everyone needs a slightly different amount and if you get less than that day after day, this deficit builds up until the serotonin levels are so high that we find it impossible to think or stay awake.

Obviously that explanation is an oversimplification, but it works for the purpose of this article. So what's the best way to get into a healthy sleep cycle and stay there? I'll go into why later on. The first thing to do is to establish a routine. That doesn't mean always doing the same thing day after day. What...

...it means is that you should schedule time to sleep. Think of sleep as a high priority on your busy schedule. It's a meeting that you must show up to on time and even if your nightly visitor is late, you must set the time aside. Toward bed time, turn bright lights off. The pineal gland won't begin producing melatonin if your environment is too bright. Don't take phone calls from friends who have a cloud of drama around them and don't make any big decisions late at night. You will find that your mind will dwell on these issues and reduce the restfulness of your sleep. Back away from stressful projects in the evenings such as balancing your checkbook or reading your child's report card...unless they're a good student.

So how can you help ease yourself into a healthy sleep cycle if you're having trouble sleeping? One way is to take short-term prescription sleep aids like Ambien®. These are not necessarily sleeping pills, what they really are is memory blockers for the overactive mind. Ambien® prevents you from remembering all of the pressing issues in your life which in turn removes the agitation and anxiousness that often interferes with sleep. Then as soon as the neurotransmitter levels are right off you go to sleepytown. Ambien® is a great sleep inducer, but it has some side effects. It is habit forming...no matter what they say about it not being so...it is. Ambien® CR can also lead to somnambulism which is a condition like sleepwalking which can lead a person to take dangerous or embarrassing action while they are functionally asleep. Before trying anything as drastic as prescription sleep aids, we recommend taking melatonin. This is a safe, effective precursor to serotonin and occurs naturally as a component of the sleep cycle. Taking 0.3 to 3.0 mg. of melatonin about 30 minutes before bed time will help ensure that when you go to bed, your brain is ready to initiate a sleep period. If you take the higher dose, it may not be necessary to take it every night. Listen to your body and if it doesn't help after a few days, your dose may be too high.

Here's why you need restful, enjoyable sleep. The first and most important reason would seem to be your body's health, right? Nope. It's your state of mind. Sleep deprivation almost always leads to or aggravates depression. When your state of mind improves and your mind is well-rested, you will quickly notice improved productivity, an increase in subconscious creativity & problem solving, stress relief, and an overall improvement in mood. You deserve to be happy and protecting your important sleep time is one way to reward yourself.

One more note about melatonin. Several studies have been done on melatonin's safety and effectiveness in children and teens. It's one of only two hormones on the market not regulated by the FDA because it has repeatedly been shown to be safe. Teens taking 0.3 mg. of melatonin 30 minutes before bed were significantly more likely to fall asleep sooner and fall asleep easier after awakening during the night. Consequently, their grades improved. This same result has been repeated several times by different testing companies and none found any ill effects related to the use of melatonin at the recommended levels.

- W. T. Loesch III, Vice-President

## MRSA: PREVENTING A DEADLY INFECTION

Most people have heard of a "Staph" infection. It typically appears as a pimple or cyst on the skin that gets very bad very fast. One common characteristic of Staph infections is that they are very painful. As the bacteria multiply, they release toxins that break down the connective tissue underneath the skin and over-stimulate the pain receptors in the nerve endings. Usually, this type of infection can be treated with simple antibiotics. It isn't going to stay that way for much longer. Methicillin-resistant Staphylococcus aureus appeared in the 1960's in hospitals in the US probably as a result of...

...repeated exposure to non-curative doses of various antibiotics. Methicillin is an antibiotic which treats bacteria that are resistant to penicillin because it can get through the enzyme defense system the bacteria use to resist other antibiotics. Over the years, as the number of encounters between Staph and newer antibiotics increases, the bacteria are finding ways to undermine the curative action of the drugs so some of the bacteria in a wound can survive. When this happens, the remaining bacteria multiply into a new infection in which all of the organisms can resist the antibiotic.

A study published in the October 17, 2007, issue of the Journal of the American Medical Association described the frequency of invasive or more severe MRSA infection in 9 geographically separated communities across the United States.<sup>(i)</sup> The CDC [Centers for Disease Control] study group concluded that in 2005, there were approximately 90,000 persons diagnosed with severe MRSA infection, mostly elderly, and an estimated 19,000 patients died. That's a 21% mortality rate.

So what can you do to protect yourself? You may already be doing it. We want to find out how good Loesch® Kleer-Plex® Antiseptic Face & Body Wash worked against MRSA. In a test conducted by an independent company, it was determined that this product kills 92.3% of MRSA in 30 seconds and 97.0% in 2 minutes. What that means is this...if you ALREADY HAVE MRSA ON YOUR SKIN, you can reduce your chances of being infected by it by 92.3% in 30 seconds or 97.0% in 2 minutes by using Loesch® Kleer-Plex® Antiseptic Face & Body Wash for frequent hand washing, to clean dishes, take showers, and clean household surfaces. This habit can go a long way toward decreasing your individual risk of exposure to this aggressive organism. It's important to establish a habit of proper cleanliness. Avoid abrasive surfaces that indirectly expose you to other people such as artificial grass, floors, and workout equipment that has not been properly cleaned with alcohol. Carry antiseptic wipes with you to the gym. It sounds unfashionable but so is dying from a preventable infection. Sports teams have been having a serious problem with Staph infections because they get tackled repeatedly on the same abrasive surface as others on their team. Even sharing a razor or towel in a locker room can lead to exposure. Keep in mind that MRSA can't get through your skin by itself. The skin must be broken by something. Shaving nicks are one of the most common ways this infection gets started.

- W. T. Loesch III, Vice-President

Medscape J Med. 2008; 10(2): 32. Published online 2008 February 8. Thomas Ward, Infectious Diseases, Portland Oregon VA Medical Center, Portland, Oregon.

(i) Klevens RM, Morrison MA, Nadle J, et al. Invasive MRSA in the United States. JAMA. 2007;298:1763-1771.

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