Of all the diseases that I have studied and treated tuberculosis (TB) scares me the most. This is the most ancient and resilient disease known to humankind. Tuberculosis has infected humans on the Earth for over 3,000 years. At one time it was the leading cause of death in the United States and is currently the biggest infectious-disease killer in the world. In the year 2005, it was estimated that nine million people would be diagnosed with tuberculosis worldwide, two million of these were predicted to die from the disease and another forty million would be infected without knowing it. In Peru and developing countries TB is endemic. There are thousands of people inflicted with this disease. You as the reader might wonder why this should be important to know, the reason is this disease can be contracted very easily. On an airplane, in a supermarket, hotel, or anyplace where people are, you can contract TB. (Fig 1)

My experience in Peru has opened my eyes to the world of TB. I have seen 20 year old males with TB die within 24 hours upon admission to the hospital. I have seen a 25 year old male with HIV and TB. I’ve seen a 68 year old with chronic TB spitting up 50 cc of blood every day. Tuberculosis is spread rather easily through direct or indirect contact with those who are infected. Usually it is transmitted through the air (infected people coughing or sneezing). The bacteria belongs to the group know as mycobacterium which causes tuberculosis. The bacterium is a very slow bacterium that divides every 16 to 20 hours, which helps the disease get established in people. (Fig 2)

About one third of the world’s population is infected with tuberculosis. It is easily spread from person through aerosol droplets containing the bacterium from those with active tuberculosis. Close and prolonged contact with the infected individual is the highest risk in becoming infected with tuberculosis. This disease has a tremendous affect for people who are immunocompromised such as HIV, health care workers, and young children.
The transmission begins when the infected individual coughs, sneezes, or talks. The bacterium travels into the air, and then may be inhaled by an uninfected person. When tuberculosis bacteria are inhaled they are engulfed by macrophages, which are present in the air sacs of the lungs. Their job is to remove pathogens from the lungs. The bacteria then begin to multiply within the lungs, before spreading to other parts of the body. If the tuberculosis bacterium gets into the bloodstream the brain, liver, bones, joints or kidneys can all become infected.

There are two forms of tuberculosis: TB infection and TB disease. Only 10% of patients with tuberculosis infection develop tuberculosis disease or active TB. Most patients have an immune system capable of fighting the TB bacteria and stopping them from multiplying and spreading with the human body. About two weeks after becoming infected with TB, the immune system responds by walling off the infected cells. The bacteria are not killed, but become dormant and are stored inside the body.

Antibiotics are used to treat both active and latent TB. Treatment for active tuberculosis may include taking four medicines: Isoniazid, Rifampin, Ethambutol, and Pyrazinamide. Active TB is usually treated with six to nine months of multiple antibiotics. During the long treatment process one may become lazy in taking their meds or think it’s not necessary after symptoms disappear. However, if one does not finish treatment or misses doses, TB may still be present even if symptoms are not. This may leave the stronger bacteria to multiply and an entire new generation of drug-resistant bacteria to grow. “Patients with drug-resistant tuberculosis are four times more likely to die than patients with standard tuberculosis.” It is imperative that once treatment has begun the patient stays on his medications. Doctors are even using “direct observational treatment.” This may include daily visits to the physician to take your medicine under observation to ensure the patient is following medication instructions. Surgery may also rarely be used to treat complications of TB. Surgery may repair lung damage or remove pockets of bacteria that cannot be killed. (Fig 3)

Patients with latent TB may be treated with antibiotics to keep from developing active TB. Their antibiotic regimen may include just one or two different medicines. TB is easier to treat in the latent state and in some opinions should be the focus of eradicating the disease. Vaccines
are used in many parts of the world but are discouraged in the United States, because people who receive the vaccine test positive for tuberculosis. This positive test eliminates early diagnostic testing, when the disease is treated easier. Other possible vaccinations are being explored including one using gene therapy to boost the immune system and its defenses. (Fig 4)

Travel and immigration make tuberculosis the world’s problem. My experience in Peru and the magnitude of TB and the effects it has on other South American, Central American and Caribbean countries is staggering. The sheer impact is not just on treating people but the effect TB has on the economy of these areas due to lost days of work and productivity. If we have an aggressive program for education and prevention of TB maybe we can improve the standard living conditions in these societies. Maybe one day this nightmare disease will be a distant memory. One of my colleagues who is an emergency room doctor at EsSalud hospital Iquitos and Hospital Iquitos has had three of his classmates from medical school die from TB. These were educated professional and it had full medical treatment. TB is the nightmare for the ages unless we developed a very effective prevention and educational program that is administer world wide. I believe we are losing because it is a silent and hidden disease.