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Silicosis - Silica Dust Exposure to the Railroad Worker

Ballast Dust – Risks and You

Occupational Health Issues ~ NR Ballast Working Group Presentation

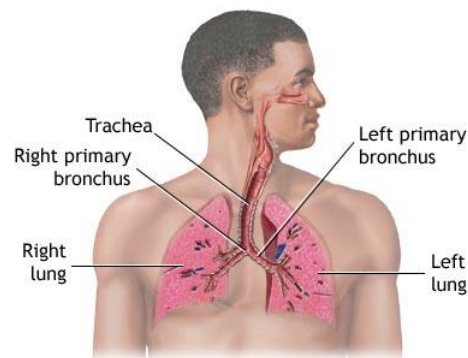
- ❖ Natural Aggregates, including **Ballast** contain silica, and produce silica dust known as Respirable Crystalline Silica (RCS).
- ❖ Inhaling RCS can lead to silicosis. Silicosis is a serious and irreversible lung disease that causes permanent disablement and early death. This can be exacerbated by smoking.
- ❖ Silicosis is an occupational lung disease that develops over time when dust that contains silica is inhaled into the lungs.



Silicosis damaged lungs



Microscopic RCS



ADAM.

Extract from American Railroad Magazine:

How long before it's an issue in the UK?

FELA LAWSUIT FOR SILICOSIS

Many railroad workers are exposed to silica dust from ballast operations, sandblasting, painting, rock drilling, chipping and in tunnel and track construction and repair. Maintenance of way workers, especially those who regularly operate machinery such as ballast regulators, spens, adzers, brooms, scarfers, tie tampers, undercutters, and related machinery are especially at risk for contracting silicosis and other related lung diseases. Ballast, the rocks which are placed under rails and between railroad ties, are often granite and sometimes limestone. Granite contains high quantities of silica (quartz). As the ballast is manipulated, drilled, hammered, crushed and levelled during Track Maintenance, silica dust is generated which is often inhaled by the railroad workers. Many other railroad workers are exposed to asbestos products which can cause asbestos lung cancer and mesothelioma. An injured railroad worker who has been diagnosed with mesothelioma can file a FELA lawsuit.

Additionally, the family of the railroad worker has legal rights under the FELA and other legal actions against the asbestos manufacturers and distributors of these asbestos products.



SILICOSIS- A RAILROAD WORKERS DISEASE



Silicosis is the chronic fibrosing disease of the lungs produced by the prolonged and extensive exposure to free crystalline silica dust. When workers inhale crystalline silica (dust), the lung tissue reacts by developing fibrotic nodules and scarring around the trapped silica particles. This fibrotic condition of the lung is called silicosis. If the nodules grow too large, breathing becomes difficult and death may result. Silicosis victims are also at high risk of developing active tuberculosis. Silicosis is scarring of the lung due to breathing silica (quartz) dust. Silicosis is one of the most common forms of pneumoconiosis (lung diseases caused by inhaling certain mineral dusts). Exposure to silica (quartz) dust causes changes on a chest x-ray which can be evaluated by a doctor trained in diagnosing silica-caused diseases. Silicosis is a latent disease, that is, it develops slowly over many years. Silica-caused diseases often do not appear for 10-15 years after a railroad worker's exposure to silica (quartz) dust. However, once you have inhaled silica (quartz) dust, it cannot be removed from your lungs.

Types of Silicosis:

A railroad worker exposed to silica dust may develop any of three types of silicosis, depending on the concentration of airborne silica:

- ❖ **Chronic silicosis**, which usually occurs after ten or more years of exposure to crystalline silica at relatively low concentrations.
- ❖ **Accelerated silicosis** which results from exposure to high concentrations of crystalline silica and develops five to ten years after the initial exposure.
- ❖ **Acute silicosis**, which occurs where exposure concentrations are the highest and can cause symptoms to develop within a few weeks to four or five years after the initial exposure.
- ❖ **Silicosis Symptoms for Railroad Workers Exposed to Silica Dust:**

Early stages of silicosis may go unnoticed for the railroad worker. Continued exposure to silica dust at work for the railroad may result in a shortness of breath on exercising, possible fever and occasionally bluish skin at the ear lobes or lips. Silicosis makes a person more susceptible to infectious diseases of the lungs, such as tuberculosis. Progression of silicosis leads to fatigue, extreme shortness of breath, loss of appetite, pains in the chest, and respiratory failure, which may cause death. Further the diesel fumes and other types of smoke and fumes only make the workers ability to breath even harder and should be avoided.

At Risk Railroad Jobs with Potential for Silica Dust Exposure:

It is generally recognized that some railroad workers have the high risk of being exposed to silica dust and contracting silicosis:

- ❖ Construction
- ❖ Mining - Tunnelling
- ❖ Sandblasting
- ❖ Stone Crushing
- ❖ Rock Quarries Work- Rock Drilling
- ❖ Masonry - Cement Work
- ❖ Demolition
- ❖ Sandblast Dust Exposure to other Non-Sandblasters in work area
- ❖ Plumbing
- ❖ Painting

FELA LAWSUIT FOR SILICA DUST EXPOSURE RESULTING IN SILICOSIS:

If you are or a loved one was railroad worker and you have been diagnosed with silicosis or mesothelioma or you believe that due to your railroad employment that you have been exposed to free silica dust or asbestos products, then call us to discuss what can be done to protect your legal rights and whether or not you have possible silicosis based lawsuit under the FELA. Often our clients do not know when or where they were exposed to the silica dust. However after careful investigation and discussions with the worker about their job history, work duties and the types of products and materials that they worked with, the workers often are able to discover and understand their silica exposure history.

Sometimes due to health reasons, it becomes necessary to enlist the help of former co-workers to help uncover the exposure history. All cases are handling by a contingency fee contract, which means that there will be NO charges to the client for any attorneys fees or legal cases expenses unless we make a recovery for the client.

NO FEES OR EXPENSES CHARGED TO CLIENT(S) UNLESS A RECOVERY OR SETTLEMENT IS OBTAINED. TALK TO A SILICOSIS LAWYER NOW at 1-800-883-9858 or 1-800-468-4878 or [click here](#) for online Silicosis Legal Help

Notice/Disclosure Disclaimer Mr. Willis is Board Certified in Personal Injury Trial Law by the Texas Board of Legal Specialization.

Diagnosis



Kidney tissue, using a silver staining technique, revealing the presence of *Leptospira* bacteria

On infection the microorganism can be found in blood and cerebrospinal fluid (CSF) for the first 7 to 10 days (invoking serologically identifiable reactions) and then moving to the kidneys. After 7 to 10 days the microorganism can be found in fresh urine. Hence, early diagnostic efforts include testing a serum or blood sample serologically with a panel of different strains.

Kidney function tests (blood urea nitrogen and creatinine) as well as blood tests for liver functions are performed. The latter reveal a moderate elevation of transaminases. Brief elevations of aspartate aminotransferase (AST), alanine aminotransferase (ALT), and gamma-glutamyltransferase (GGT) levels are relatively mild. These levels may be normal, even in children with jaundice.

Diagnosis of leptospirosis is confirmed with tests such as enzyme-linked immunosorbent assay (ELISA) and polymerase chain reaction (PCR). The MAT (microscopic agglutination test), a serological test, is considered the gold standard in diagnosing leptospirosis. As a large panel of different leptospira must be subcultured frequently, which is both laborious and expensive, it is underused, especially in developing countries.

Differential diagnosis list for leptospirosis is very large due to diverse symptomatics. For forms with middle to high severity, the list includes dengue fever and other hemorrhagic fevers, hepatitis of various etiologies, viral meningitis, malaria, and typhoid

fever. Light forms should be distinguished from influenza and other related viral diseases. Specific tests are a must for proper diagnosis of leptospirosis.

Under circumstances of limited access (e.g., developing countries) to specific diagnostic means, close attention must be paid to the medical history of the patient. Factors such as certain dwelling areas, seasonality, contact with stagnant contaminated water (bathing, swimming, working on flooded meadows, etc.) or rodents in the medical history support the leptospirosis hypothesis and serve as indications for specific tests (if available).

Leptospira can be cultured in Ellinghausen-McCullough-Johnson-Harris medium (EMJH), which is incubated at 28 to 30 °C. The median time to positivity is three weeks with a maximum of three months. This makes culture techniques useless for diagnostic purposes, but is commonly used in research.

Prevention

Doxycycline has been provided once a week as a prophylaxis to minimize infections during outbreaks in endemic regions. However, there is no evidence that chemoprophylaxis is effective in containing outbreaks of leptospirosis. Pre-exposure prophylaxis may be beneficial for individuals traveling to high-risk areas for a short stay.

Effective rat control and avoidance of urine contaminated water sources are essential preventive measures. Human vaccines are available only in a few countries, such as Cuba and China. Animal vaccines only cover a few strains of the bacteria. Dog vaccines are effective for at least one year.

Leptospirosis

Leptospirosis (also known as **field fever**, **rat catcher's yellows**, and **pretibial fever** among others names) is an infection caused by corkscrew-shaped bacteria called *Leptospira*. Symptoms can range from none too mild such as headaches, muscle pains, and fevers; to severe with bleeding from the lungs or meningitis. If the infection causes the person to turn yellow, have kidney failure and bleeding, it is then known as **Weil's disease**. If it causes lots of bleeding from the lungs it is known as **severe pulmonary haemorrhage syndrome**.

Up to 13 different genetic types of *Leptospira* may cause disease in humans. It is transmitted by both wild and domestic animals. The most common animals that spread the disease are rodents. It is often transmitted by animal urine or by water or soil containing animal urine coming into contact with breaks in the skin, eyes, mouth, or nose. In the developing world the disease most commonly occurs in farmers and poor people who live in cities. In the developed world it most commonly occurs in those involved in outdoor activities in warm and wet areas of the world. Diagnosis is typically by looking for antibodies against the bacteria or finding its DNA in the blood.

Efforts to prevent the disease include protective equipment to prevent contact when working with potentially infected animals, washing after this contact, and reducing rodents in areas people live and work. The antibiotic doxycycline, when used in an effort to prevent infection among travelers, is of unclear benefit. Vaccines for animals exist for certain type of *Leptospira* which may decrease the risk of spread to humans. Treatment if infected is with antibiotics such as: doxycycline, penicillin, or ceftriaxone. Weil's disease and severe pulmonary hemorrhage syndrome result in death rates greater than 10% and 50%, respectively, even with treatment.

It is estimated that seven to ten million people are infected by leptospirosis a year. The number of deaths this causes is not clear. The disease is most common in tropical areas of the world but may occur anywhere. Outbreaks may occur in slums of the developing world. The disease was first described by Weil in 1886 in Germany. Animals who are infected may have no symptoms, mild symptoms, or severe symptoms. Symptoms may vary by the type of animal. In some animals *Leptospira* live in the reproductive tract, leading to transmission during mating.

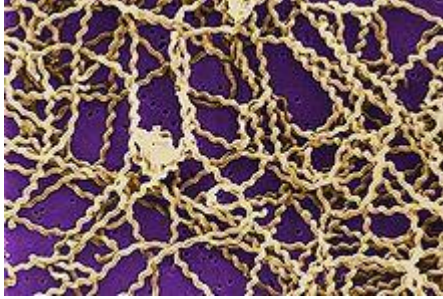
Signs and symptoms

Leptospiral infection in humans causes a range of symptoms, and some infected persons may have no symptoms at all. Leptospirosis is a biphasic disease that begins suddenly with fever accompanied by chills, intense headache, severe myalgia (muscle ache), abdominal pain, conjunctival suffusion (red eye), and occasionally a skin rash. The symptoms appear after an incubation period of 7–12 days. The first phase (acute or septicemic phase) ends after 3–7 days of illness. The disappearance of symptoms coincides with the appearance of antibodies against *Leptospira* and the disappearance of the bacteria from the bloodstream. The patient is asymptomatic for 3–4 days until the second phase begins with another episode of fever. The hallmark of the second phase is meningitis (inflammation of the membranes covering the brain).

90 percent of cases of the disease are mild leptospirosis. The rest experience severe disease, which develops during the second stage or occurs as a single progressive illness. The classic form of severe leptospirosis is known as Weil's disease, which is characterized by liver damage (causing jaundice), kidney failure, and bleeding. Additionally, the heart and brain can be affected, meningitis of the outer layer of the brain, encephalitis of brain tissue with same signs and symptoms; and lung affected as the most serious and life-threatening of all leptospirosis complications. The infection is often incorrectly diagnosed due to the nonspecific symptoms.

Other severe manifestations include extreme fatigue, hearing loss, respiratory distress, and azotemia.

Cause



Scanning electron micrograph of a number of *Leptospira* sp. bacteria atop a 0.1 μm polycarbonate filter.

Leptospirosis is caused by spirochaete bacteria belonging to the genus *Leptospira*. 21 species of *Leptospira* have been identified. 13 species cause disease or have been detected in human cases.

Leptospira are also classified based on their serovar. About 250 pathogenic serovars of *Leptospira* are recognized. The diverse sugar composition of the lipopolysaccharide on the surface of the spirochete is responsible for the antigenic difference between serovars. Antigenically related serovars are grouped into 24 serogroups, which are identified using the microscopic agglutination test (MAT). A given serogroup is often found in more than one species, suggesting that the LPS genes that determine the serovar are exchanged between species.

The traditional serologic system currently seems more useful from a diagnostic and epidemiologic standpoint—but this may change with further development and spread of technologies like polymerase chain reaction (PCR).

Transmission

Leptospirosis is transmitted by the urine of an infected animal and is contagious as long as the urine is still moist. Although *Leptospira* has been detected in reptiles and birds, only mammals are able to transmit the bacteria to humans and other animals. Rats, mice, and moles are important primary hosts—but a wide range of other mammals including dogs, deer, rabbits, hedgehogs, cows, sheep, raccoons, opossums, skunks, and certain marine mammals carry and transmit the disease as secondary hosts. In Africa, the banded mongoose has been identified as a carrier of the pathogen, likely in addition to other African wildlife hosts. Dogs may lick the urine of an infected animal off the grass or soil, or drink from an infected puddle.

House-bound domestic dogs have contracted leptospirosis, apparently from licking the urine of infected mice in the house. The type of habitats most likely to carry infective bacteria are muddy riverbanks, ditches, gullies, and muddy livestock rearing areas where there is regular passage of wild or farm mammals. The incidence of leptospirosis correlates directly with the amount of rainfall, making it seasonal in temperate climates and year-round in tropical climates. Leptospirosis also transmits via the semen of infected animals.

Humans become infected through contact with water, food, or soil that contains urine from these infected animals. This may happen by swallowing contaminated food or water or through skin contact. The disease is not known to spread between humans, and bacterial dissemination in convalescence is extremely rare in humans. Leptospirosis is common among water-sport enthusiasts in specific areas, as prolonged immersion in water promotes the entry of the bacteria. Surfers and whitewater paddlers are at especially high risk in areas that have been shown to contain the bacteria, and can contract the disease by swallowing contaminated water, splashing contaminated water into their eyes or nose, or exposing open wounds to infected water.

At risk occupations

Occupations at risk include veterinarians, slaughterhouse workers, farmers, sewer maintenance workers, waste disposal facility workers, and people who work on derelict buildings. Slaughterhouse workers can contract the disease through contact with infected blood or body fluids. Rowers, kayakers and canoeists also sometimes contract the disease. It was once mostly work related but is now often also related to adventure tourism and recreational activities.