



A Hidden Health Hazard In Schools How Protected Are Teachers And Students?

If You Recirculate The Air In A Building Repeatedly,
It's Like Bathing In Someone Else's Bath Water

Indoor air pollution, in schools, as well as commercial, public buildings and homes is being recognized as a serious health problem. Researchers have discovered the indoor air quality inside a building can be much worse than the air quality outside. Most people spend 90 percent of their time indoors, whether it be at home, at work, in school or in a car driving. Twenty percent of the U.S. population, nearly 55 million people, spend their days in our elementary and secondary schools. Studies show that one-half of our nation's 115,000 schools have problems linked to indoor air quality. Students are at greater risk because of the hours spent in school facilities and because children are especially susceptible to pollutants. The health and comfort of students and teachers are among the many factors that contribute to learning and productivity in the classroom, which in turn affect performance and achievement.

Over the past decade there has been an increased concern with Indoor Air Quality (IAQ) in the environmental health and safety field as well as the general public. Indoor Air Quality refers to the quality of air within public buildings. Poor IAQ or better known as "Sick Building Syndrome" are terms used whenever occupants of these areas experience adverse health effects that subside upon leaving a sick building. These symptoms can range from: headaches, itching burning eyes, skin irritation, fatigue, dry throat, sinus congestion, dizziness, and nausea warns Joseph Baribeau, president and founder of Coastal Enviro-Solutions, Inc. a leader working in the environmental industry providing solutions to Indoor Air Quality and other environmental hazards for twenty-eight (28) years.

Because many illnesses can cause these symptoms notes Baribeau, diagnosing sick building syndrome is difficult. Extremely high levels of some contaminants, such as carbon monoxide, can cause more serious illness, including death says Baribeau. Many different types of indoor pollutants have been implicated as the sources of IAQ problems including: airborne dust, bioaerosols; carbon dioxide (CO_2); carbon monoxide (CO); environmental tobacco smoke; formaldehyde; ozone (O_3); radon; and volatile organic compounds (VOC's). Other environmental factors such as ambient temperature, relative humidity, and poor ventilation also contribute to the quality of air in your home or at your work

environment. If you feel that the quality of air in your indoor working environment is poor or making you ill, you should first notify your supervisor. They can call an IAQ specialist to arrange for IAQ testing. If your supervisor cannot resolve the issue an IAQ investigation can be scheduled to find the source of the problem. If abatement is necessary, it should be done by a qualified environmental firm that has the capability to abate microbiological contamination. Baribeau warns, be sure to take note of important information regarding any health effects you experience. This may include; what time of day you experience symptoms, do you feel the same symptoms after you have left the building or do you feel better, do you smell any odors, is there any visible contamination, such as water damage or water stains, are the building's heating and air conditioning vents and registers soiled with dust or debris etc. It is important to make sure the investigation is as accurate as possible.

What Does an IAQ Investigation Entail? A typical IAQ survey may consist of an investigation into the following indoor air parameters. However, each IAQ survey poses a unique set of circumstances that will dictate which of the following areas are addressed. Building Ventilation System, Carbon Dioxide Concentrations, Microbiological Contamination, Temperature, Relative Humidity, Dust Concentrations, Volatile Organic Compounds (VOC's), formaldehyde, ozone, tobacco smoke, carbon monoxide, or acid gases. A detailed IAQ Investigation Report will include the findings of all the investigated parameters and will summarize the results of any air sampling. Based on the findings of the IAQ survey, recommendations as to how to resolve any potential or existing IAQ problems will be provided. Some education committee's claim that "testing would cost too much money". This is not always true. The cost of corrective action is minimal compared to the cost of ignoring the problem

Poor indoor air quality is generally caused by the lack of adequate ventilation and maintenance, which results in a buildup of contaminants from sources in a building. The National Institute for Occupational Safety and Health identified inadequate ventilation as the primary problem in more than half the workplace indoor air investigations it has conducted. These investigations revealed that proper ventilation is important in maintaining good indoor air quality. Most buildings heating, ventilation, and air conditioning (HVAC) systems recirculate indoor air to conserve energy. "This is like bathing in someone else's bath water" says Baribeau. The current trend in construction is to reduce air leakage through cracks and other openings in walls, floors, and roofs. The combination of these construction practices and the re-circulation of indoor air has led to an increase in indoor air problems says Baribeau. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) recommends that a minimum of 15 cubic feet of outdoor make-up air per minute (CFM) per person be brought into the indoor living areas of residential buildings. The ASHRAE guidelines for make-up air for commercial buildings are much higher. This fresh make-up air dilutes indoor contaminants and helps exhaust them from a building. Inadequate maintenance and cleaning of the HVAC system ductwork also may

contribute to indoor air quality problems notes Baribeau. Also ventilation system filters that are not replaced or cleaned on a regular basis may become clogged, reducing air flow volume, quality, and distribution. Dirty filters and air ducts may also become places for bacteria and molds to grow and be distributed throughout a building.

Humidifier systems on HVAC systems also must be properly maintained and cleaned to prevent bacteria and mold contamination. You need to also be aware of "Biological Contaminants" says Baribeau. Biological contaminants in a building may include mold, bacteria, viruses, dust mites, and pollen. Bioaerosols released into the air can be distributed throughout a building by the HVAC system. Bioaerosols can cause infectious diseases such as Legionnaires' disease. Legionnaire's disease was first identified in 1976, when 34 people died and 221 fell ill during an American Legion Conference in Philadelphia. Biological contaminants also can cause allergic reactions, including hypersensitivity and some types of asthma. Symptoms caused by biological pollutants include sneezing, eye irritation, rashes, sinus infections, coughing, dizziness, and respiratory infections. Factors that can contribute to the growth of biological contaminants are wet or moist building materials (carpeting, ceilings, walls) and poorly maintained humidifiers, dehumidifiers, and even ductwork from air conditioning systems. "Humidifier fever" is a common illness caused by improper maintenance of humidifiers that can produce fever, chills, headaches, and persistent coughs. Various fungi and bacteria grow quickly in the warm, stagnant water inside humidifiers, coils and drip pans in HVAC systems. During operation, these contaminants can be distributed into the air and inhaled by the building occupants. This is why it is equally important to clean and maintain HVAC systems regularly notes Baribeau. Typically components of an HVAC systems should be cleaned in the spring and in the fall.

There are many ways to improve poor indoor air quality. One of the best ways is to make sure the heating and air conditioning systems (HVAC) are well maintained. This includes inspection and cleaning of the entire HVAC system including supply and return ductwork, registers, coils, drip pans, air handling units and filters. Also filters should be cleaned or replaced frequently. Good maintenance and ventilation are keys in keeping indoor air pollution under control. Remember moisture control is also another factor in reducing Biological Contaminants. Molds, mildews, and dust mites like moist places. It is equally important to make sure there is no roof leaks or water leakage from plumbing. In the summer months the ducts from an HVAC systems can generated moisture and water from condensation. Controlling the humidity level in a building is equally important. Elevated humidity levels are perfect breeding ground for Biological contaminates such as mold. HVAC systems should be inspected and serviced regularly. Most importantly, practice good housekeep skills. The EPA provides an IAQ Tools for Schools Program that includes checklists for many topics relating to Healthy Schools. Their website is: www.epa.gov/iaq/schools/ If you're not sure about the Indoor Air Quality in your school, building, workplace or

at home call an IAQ specialist to conduct an investigation or testing. A thorough investigation is always a good place to start.