

Safe Science: Be Protected!

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NOTHING TO SNEEZE AT!

I. SICK BUILDING OR LABORATORY SYNDROME?

Schools and specifically science laboratories have recently been the focus of air quality and health related allergy problems. Allergy and asthma cases have been increasing dramatically over the past few years. In the United States, 8.9 million children under 18 have been diagnosed with asthma, according to the National Center for Health Statistics, CDC. In 2002, 187 children under 18 died from asthma. Asthma accounts for 14.7 million missed school days annually. The number of children diagnosed with hay fever during 2003 is 7.1 million or 9.7%.

In Australia, 14-16% of children have asthma. There has been an increase in the proportion of children with asthma in the 1980s and 1990s according to the Australian Centre for Asthma Monitoring. Similar statistics can be found worldwide.

The varieties of allergens include dust, pollen, ragweed, peanuts, chemicals (e.g.: pyrethrum, gelatin, glues, gums, diazomethane, toluene) latex and more. Although no common listing of chemicals as allergens is available, Material Safety Data Sheets may list be helpful in listing allergy symptoms.

The following information on allergen sources in school science laboratories may be helpful in efforts to help improve indoor air quality and reduce allergen levels for both students and teachers.

II. TO AIR IS HUMAN!

Poor or inadequate air exchange in science laboratories is unacceptable and illegal. Fire and building code standards require air in science laboratories to be at a 100% fresh air intake level. No air may be transferred or recycled to other parts of the building. Some laboratories rely on fume hood exhaust to clear the air. This again in almost all cases is not acceptable. Hoods are designed to evacuate only a very small area. Between windows that are designed not to open, air-tight buildings and improper laboratory ventilation, airborne allergens tends to be stuck inside. This only exacerbates allergies symptoms for occupants. Occupied science laboratories should have approximately 8 or more room air exchanges per hour. Unoccupied science laboratories are set at 4 room air exchanges per hour by the National Fire Protection Association.

Ask the principal or district safety officer to have an HVAC survey done in the science laboratory to determine room air exchange rate, percentage of fresh make-up air, etc.

III. FRIENDLY CRITTERS?

Animals are an excellent resource for fostering learning experiences in the science laboratory. However, they also are sources of dander, feces and urine. Some students are allergic to animal fur/hair and excretions. Ammonia products in animal urine can cause problems. Rhinitis and sinusitis infections can easily develop as a result to exposure to animals. The cedar shavings used for bedding in cages can also be a source of allergens.

Keep cages clean each day and behind glass or plastic panels if possible. If there are students with animal allergies, alternative animals such as invertebrates might be a better choice.

IV. CHEMICAL-WISE, ALLERGY FOOLISH!

Forget the heavy duty hazardous laboratory chemical stuff! Just the bleaches, cleansers, floor treatments, spray cleaners, and soaps are enough to put students into the allergy orbit. Pesticides are another whole area of concern. Many states have legislated pesticide statutes to reduce or eliminate student exposure. Certain laboratory chemicals can also cause problems such as vapors from acids, bases, aldehydes and other organic substances.

Schools should use environmentally friendly or "green" chemical cleaners in efforts to reduce student and faculty exposure to allergens. Teachers should try to find alternative to hazardous chemicals and/or introduce microchemistry.

Chalk dust is not your everyday science laboratory chemical but for any one with a chalk allergy – be it teacher or student, it might as well be a hazardous chemical. Switch to white board using low or no VOC markers.

V. THE LAST SUPPER?

Food items are often used in science laboratories – especially in life science and biology. Peanut activities are a popular laboratory. Unfortunately, some students are not only allergic to eating peanuts, but also peanut vapors. Honey is another food item used from at times in lab work. Some students are allergic to the pollen granules found in honey. Eggs are yet another food item used in science laboratory activities that could cause problems. Some students can be allergic to eggs.

VI. FORGET THE FEATHER DUSTER!

Occupational health and safety regulations require good housekeeping in the laboratory. This includes keeping the area free of dust. Dust resulting from dead skin, hair particles, and other particulate matter contribute to allergen buildups. Though unbelievable, some science laboratories are carpeted. This is another whole issue relative to harboring allergen in the laboratory. Dust mites can present their own allergy reactions and also should be addressed.

Floors in science laboratories need to be cleaned each day by the custodial staff. This will help to keep down the dust and other allergens present in the laboratory.

VII. OLDIES BUT MOLDIES!

Dark, moist and warm environments foster the growth of molds. Often a wet ceiling tile, dripping pipe under sinks, wet window sill, leaks between walls,

etc. will be the “Fertile Crescent” for mold growth. Once mold takes hold and spores develop, they are airborne. At the first evidence or symptoms of mold growth, contact the administration or supervisor to having it abated before the allergens take over.

VIII. ACTIONS, NOT APOLOGIES!

In summary – there are several proactive strategies or actions that can be adopted. Include are the following:

1. Schools need to have registration procedures which require parents or guardians of students to inform school authorities if their child has any life-threatening medical conditions – including allergies.
2. The school’s medical support personnel should be required to confer with science teachers relative to any of these medical conditions. If there is an allergy which is life-threatening, parents should provide written medical advice from the child’s physician
3. Reasonable student accommodation for a life-threatening allergy should include the following guidelines:
 - a) An awareness/response plan should be developed involving the science teacher, the school nurse, the parent(s), and the administration.
 - b) Preventative actions might include:

Elimination of food products with allergens from laboratory work

Maintain effective laboratory hygiene practices

Establish emergency procedures to respond to an incident

- c) Parents should instruct their child to:

Wear a medical alert device

Take medication as appropriate

6. Procedures in response to an emergency:

Provision for the training of staff for the treatment of students at risk of anaphylaxis should be provided.

IX. FINAL SAFETY COMMENT!

Teachers need to make sure they have information relative to student allergies. This usually can be secured from the school nurse or health provider. It is also prudent practice to check with students using an information form asking about allergies. It is especially important to have this information prior to laboratory work or field trips.

There also can be liability issues for teachers should there be a serious allergic reaction effected by work in the laboratory or field. Be smart and be prepared – know what you are dealing with ahead of time!

LIVE LONG AND PROSPER SAFELY!

RESOURCES:

Allergy Mega Resource Website: <http://www.childrensdisabilities.info/allergies/resources.html>

Occupational Safety and Health Administration: <http://www.osha.gov>