Contaminants & Source Control in School Buildings: An Overview for School Facilities Managers

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The best ways to avoid harmful exposures in schools are to recognize potential contaminant sources, assess exposure routes, and eliminate, if possible, or reduce exposure. Safe cleaning and other steps can help reduce the risk of exposure.

Contaminant sources in schools

Contaminants in schools can impact occupant health and cause or contribute to symptoms and other effects experienced by occupants. These include:

- Chemical contaminants (chemicals like VOCs and bleach) can irritate the respiratory system, skin, etc. and can sometimes cause burns.
- Legacy toxics (including asbestos, PCBs, and lead, including in building infrastructure) can have long lasting effect on health or physical and mental development of the person exposed.
- Radon (naturally occurring radioactive gas). There is no safe level of exposure to radiation. It increases risk of cancer.
- Biological contaminants (exposure to bacteria, fungi and viruses) can increase risk for infection. Other biologics, like pest waste, cockroaches and pollens, can trigger allergy and asthma symptoms.

Exposure routes include inhalation, ingestion, skin absorption and injection. Reducing the hazard or exposure reduces the overall risk.

- Risk = Hazard x Exposure

Why it matters

Although not often visible, exposure to harmful chemicals like lead and radon can have long lasting effects on a body (irreversible cognitive delay, increased risk of cancer, infection and more). Sometimes the effects are more harmful if that body is still developing (like a child) because children are not little adults.

Asthma is a chronic disease that can be triggered by exposure to many of the above-mentioned hazards and is the most common cause of school absenteeism.

- Allergens that trigger attacks can include foods, cockroaches, dust mites, indoor molds, pests, pets, pollens and outdoor molds.
- Irritants can also trigger asthma attacks, and these would typically include the chemicals we use to clean and maintain buildings.
- Sensitizers are chemicals that can cause asthma. People who clean for a living are at greatest risk for developing asthma as adults because of exposure to these chemicals.

- Exercise, cold, sickness and stress can also trigger asthma symptoms.

What we can do

- Districts can drastically reduce risks that may be associated with occupant exposures.
  - What we have learned is that reducing exposure to environmental contaminants in schools may:
    - Increase student achievement and test scores.
    - Reduce school absences, which may increase funding (varies by state).
    - Decrease asthma attacks and visits to doctors.
    - Improve and maintain a safe and healthy learning space for children, their teachers and school staff.

Cleaning & Managing for Health

- There has been a philosophical change in the purpose of and the techniques used to clean and maintain school facilities: **to clean for health.**
- Safer and healthier cleaning practices and procedures, as shown in the Missouri Green Cleaning Guidelines and Specifications for Schools (and similar to homes), may reduce unwanted occupant exposures to the products used to clean and maintain the facility.
- Effective means of reducing unnecessary occupant exposures to hazardous chemicals include:
  - Source control.
  - Restricted use of more hazardous substances.
  - Implementation of integrated pest management.
  - Substituting safer and healthier alternatives for existing products
  - Performing construction/renovation activities when the facility is unoccupied.

For additional tips on environmental health and safety in schools, visit PEHSU.Net. You can also explore more factsheets to help you create a safer school environment for students, teachers and everyone in the school.

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