



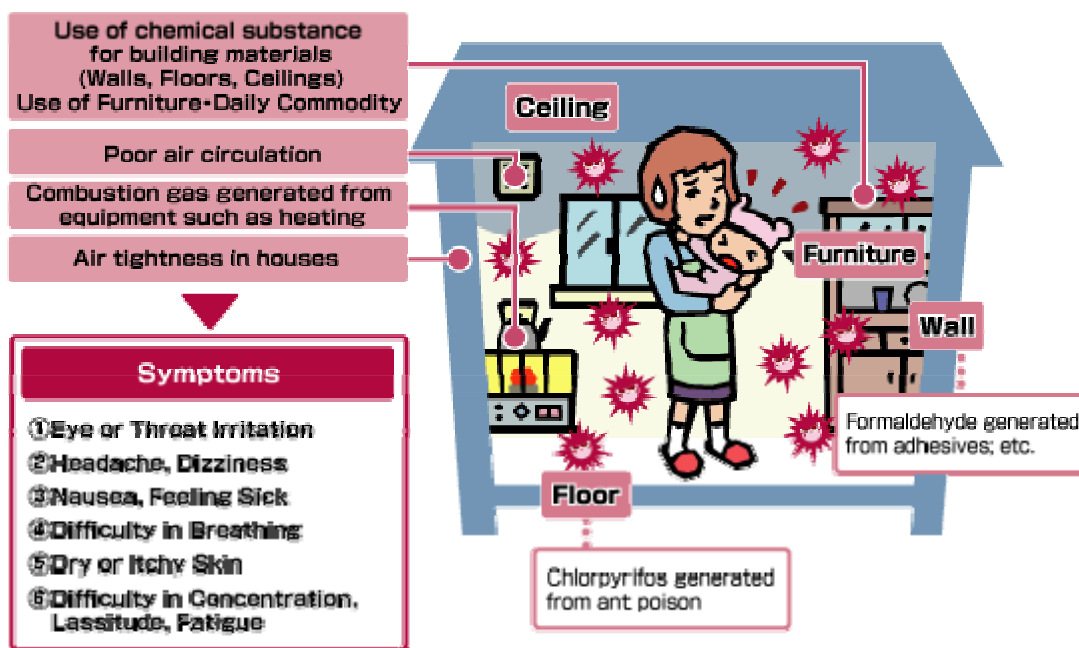
RafflesMedical

Patient Advisories: Sick Building Syndrome

Overview

The indoor environment is a creation of the modern era. Previously, buildings were notable for the extent to which they were really open to the outside air, a system that could be referred to as natural ventilation. But, technological advances have permitted us to seal buildings tightly, recirculate the air within them, and fill them with a variety of particle- and chemical-emitting materials.

Complaints and anecdotes regarding illnesses produced by life inside such buildings have become commonplace. Several categories of these illnesses have been proposed:



Specific Illnesses

Possible illnesses that could result from sick-buildings include:

- Allergic reactions to indoor allergens such as dust mites, plant products, or fungal products.
- Irritation due to (volatile) chemicals released from the environment.
- Indoor transmission of standard infectious diseases such as tuberculosis or legionellosis. This is fortunately not very common.

Non-Specific Illnesses

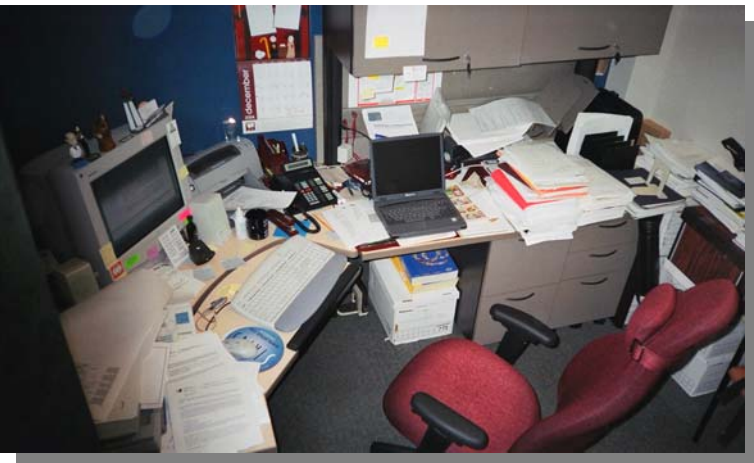
- This is a diverse group of work-related symptoms that include irritation of the skin, mucous membranes (mouth, nose, throat), headache, fatigue, and difficulty concentrating.
- A variety of factors have been associated with increased rates of these complaints: younger age, female sex, cigarette smoking, type of work (e.g., working near a photocopier or laser printer), level of office crowding, presence of carpets, and type/volume of ventilation.

In approaching this area, we focus on the sick building syndrome in the context of all of the above forms with the exception of indoor transmission of true infectious agents. The phrase "sick building syndrome" or "building-related illness" is used when there is no infection of the patient in the strict sense. Rather, some component (chemical or other material) found in the interior environment is thought to be causing the symptoms at hand.

As far as we know, there is no agreed upon definition for a "sick building," nor is it clear how to definitely diagnose a sick building. In the strictest sense, the phrase "sick building syndrome" is a poor choice of words in that it implies many "disease" concepts that may not be accurate. For example, are there healthy buildings? Is the problem with the building truly an infection? Can the sickness be transmitted from one building to another? The term "building-related illness" has been proposed as a preferred phrase, but we use here the phrase "sick building syndrome" because of its widespread acceptance as a label for this problem.

The Usual Symptoms of the Sick Building Syndrome

From the list of associated illnesses given above, it should be clear that many types of symptoms are possible. Investigation should reveal a pattern of complaints that span multiple individuals. The chief clues to the building as the cause are:



- The presence of symptoms while working or living in the building
- The clearance of the symptoms upon leaving the building and living/working elsewhere for a while
- The return of the symptoms upon return to the building
- The presence of the symptoms in multiple individuals. Typically, there will be a few individuals who are severely affected, a larger number with moderate symptoms, and then others with no symptoms

What Factors Seem to Most Often Cause the Sick Building Syndrome?

Based on recent scientific studies, the following factors seem to be among the more prominent causes of the sick building syndrome.

Building Factors

- Mechanical ventilation
- Relative humidity < 30%
- Fresh air ventilation rates < 10 liters/second/person

Specific Environmental Factors & Pollutants

- Volatile organic compounds (VOCs): formaldehyde, solvents, etc.
- Carbon monoxide: Stoves, heaters, and furnaces
- Dust & fibres: asbestos, fibreglass, and dirt
- Bioaerosols: Bacteria, moulds, viruses, pollen, dust mites, animal danders, animal excreta
- Trapped outdoor pollutants: vehicle or industrial exhausts
- Physical factors: Lighting, vibration, noise, temperature, crowding

Personal Factors

- Female sex
- History of being allergic (atopic)
- Job-related tensions
- Job dissatisfaction

Of these many factors, complaints related to the quantity and nature of the ventilation are said to be among the most frequently identified problems. Buildings with less than ~ 10 liters/second of fresh outside air per person do appear more often associated with complaints.

How do you figure out what is causing a particular problem?

Simply having the above list of ideas from which to work may help you get started. Hiring an environmental expert might also be of value, as they may well see things that you don't see. Remember always that more than one factor could be at fault.

Brief discussion of moulds and fungi

Fungi are just one of many sources of both allergens and toxins in the environment. Some observations that have been noted include:

- The level of fungal allergens can be sufficient to induce allergic responses in sensitive individuals.
- The level of fungal toxins in environmental dust and such are usually quite low. Very closed spaces could of course build up greater quantities of toxins, but this does not appear to be the usual case.
- If the building in question contains perceptible levels of fungi (that is, fungus that is visible or producing odors), the infested area(s) should be cleaned until they are free of such levels of contamination. Sterility is not necessary; the area just needs to be free of visible and odor-producing fungus.
- Such cleaning may or may not relieve the symptoms. This is entirely to be expected; fungi are only one of the many causes of the complaints reported as part of the sick building syndrome.

In conclusion

You must always apply common sense in choosing how to adapt the ideas presented here to your own situation. When in doubt, please consult with a professional or your family physician.

Appointments

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