

BUILDING RELATED ILLNESSES
(SICK BUILDING SYNDROME)

by

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I. Commonly reported symptoms:

- A) eye irritation
- B) dry throat
- C) headache
- D) fatigue
- E) sinus congestion
- F) skin irritation
- G) shortness of breath
- H) cough
- I) dizziness
- J) nausea
- K) fever (endotoxins)

II. Common contaminants

A) Biological

1) Fungi (molds and yeast)

a) Disease states:

- 1) Allergic reactions may follow sensitization to specific antigens (fungal spores). These reactions are the most commonly encountered diseases associated with the Sick Building Syndrome. They are primarily upper respiratory (nose and throat) as fungal spores are airborne.
- 2) Specific fungi produce toxic substances such as mycotoxins. These toxins may be present on the fungal spores and would elicit a response in the lungs. The presence of mycotoxins in the lungs may interfere with the cell mediated immune response. Most recently they have been linked with AIDS.
- 3) Some fungi may be able to cause an infection and grow on the human host. This is primarily associated with the compromised host. Examples of conditions that may predispose the human to mycotic (fungal) infection include:
 - a) The use of antibacterial antibiotics such as Tetracyclines, Corticosteroids, Immunosuppressant or Antineoplastic drugs.
 - b) The individual with impaired cell-mediated immunity such as AIDS, hematologic malignancies (leukemia and lymphoma) or organ transplant patients.
 - c) Hereditary predisposition to develop immediate hypersensitivity to diseases such as Aspergillosis.
 - d) Impaired epithelium (skin) from burns, trauma or maceration.
 - e) Previous diseases such as Tuberculosis, Sarcodosis, Emphysema, Cystic Fibrosis, Diabetic Acidosis (diabetes mellitus) Hyperglycemia, Leukopenia and Malignancies
 - f) Cigarette smoke

b) Fungal contaminations hot spots:

- 1) HVAC air intake near bird nests.
- 2) HVAC condensate stagnant water in drip pan.
- 3) Air conditioned buildings where windows are closed year round.
- 4) Flooding of occupied spaces and condensation on or in the wall.
- 5) Carpeting that continually remains moist such as the hallways where children enter the building.
- 6) Flat roofs often leak and ceiling tile may serve as an excellent growth media for fungi.
- 7) Structures with concrete floors and walls may provide the necessary moisture for the growth of fungi.
- 8) Growth of the fungi may be accelerated during the summer months if the air

conditioning system is turned off.

- c) Moisture control measures:
 - 1) Prevention of condensation in ceiling, wall and floors.
 - 2) Remove all carpet that has the possibility to become moist and stay moist.
 - 3) Frequent cleaning of the cooling coils and condensate drip pans.
 - 4) Maintain proper drainage on condensate pans and drain lines.
 - 5) Sufficient dehumidification of the HVAC system.
 - 6) Promptly investigate all leaks or water problems and fix immediately.
 - 7) Remove and discard all water damaged building materials such as ceiling tiles and carpeting.
 - 8) Decontaminate all areas that have visible fungal growth with a 10% bleach solution and repeat the procedure twice with a 30 minute interval between applications. Rinse the surfaces with non-chlorinated water after two hours.
- 2) Bacteria
 - a) Legionella pneumophila: These bacteria are the causative agents of Legionnaires disease (pneumonia) and Pontiac fever. Pontiac fever is the mild form that occurs in healthy individuals and is characterized by a rapid onset of fever, chills, headaches and myalgias. A cough occurs in approximately 50% of the patients. Legionnaires disease is a severe pneumonia that may be fatal. Human pulmonary infections appear to result from contact with aerosols such as hot tubs, air conditioning, cooling towers and compost.
 - b) Pseudomonas aeruginosa: This bacteria has been associated with air conditioning and may cause a unique syndrome characterized by a vesicular or pustular rash, malaise, fatigue and otitis externa. A very serious pneumonia may develop in some patients.
 - c) Gram negative bacterial endotoxins: these cell wall bound toxins may cause a cough, itchy eyes, fever and hypotension.
- 3) Dust Mites: allergic reactions
- 4) Pollen: allergic reactions
- 5) Air borne organics
 - a) Formaldehyde: Building related materials such as urea formaldehyde foam insulation, and bonded wood products, pressed wood materials, particle board, hardwood plywood and medium density fiberboard. It causes sensory irritation potential and carcinogenic.
 - b) Volatile organic compounds (VOC): They may cause sensory irritation and cancer. These compounds may associated with carpeting, building materials, furnishings, consumer products, cleaners, office equipment, internal combustion engine exhaust, and tobacco smoke.