Occupant Health Concerns

About Environmental Initiatives

- Water Damage & Mold Investigations
- Free samples
- Indoor Air Quality Assessments
- Exposure Surveys
- Asbestos Testing
- Forensic Microbiology
- Litigation Support

Overview

- Overall investigation process
- Sensitivities
  - Allergies
  - Chemical Sensitivities
  - Sensory Sensitivities
  - Emotional Sensitivities
- Indoor Contaminants
- Psychosomatic symptoms

Investigation Process

1. Occupant interview
2. Determine if overall problem or sensitive person
3. Locate cause/contaminant
4. Follow-up interview

Occupant Interview

Ask everyone, separately, the following questions:
- List symptoms
- Are symptoms continuous or intermittent
  - If intermittent, when?
- How quickly do symptoms abate? Do they occur at other locations?
- "What do you think is occurring?"
Occupant Interview

<table>
<thead>
<tr>
<th>Percentage with Symptoms</th>
<th>Possible Contaminants</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50%</td>
<td>Combustion products, Chemical release, Dust, Temperature/humidity</td>
</tr>
<tr>
<td>25%-50%</td>
<td>Same as &gt;50%, Group dynamics or social issue</td>
</tr>
<tr>
<td>&lt;25%</td>
<td>Allergen, Dampness/mold</td>
</tr>
<tr>
<td>&lt;5%</td>
<td>Hyper-sensitivity, Psychosomatic</td>
</tr>
</tbody>
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Occupant Interview

- Sensitivities
  - Allergies & Asthma
  - Autoimmune
  - Sensory Sensitivities
  - Chemical Sensitivities

Allergies and Asthma

- Most common of all sensitivities
- Allergies
  - 25% of population
  - Allergen specific
  - 10-15% mold allergies
    - Mold specific
    - Immediate reactions
    - Delayed reactions
How are allergies triggered?

- **Autoimmunity**: immune system attacks self
- **General Inflammation**: low-level, body-wide immune activity

Examples include:
- Lupus
- Multiple sclerosis
- Crohn’s Disease
- Rheumatoid arthritis
- Depression

Autoimmune and General Inflammation

- Acute sensitivity to a specific, group, or a range of chemical compounds.
- Labels:
  - Chemical Sensitivity
  - Chemical Intolerance
  - Multiple Chemical Sensitivity (MCS)
  - Idiopathic Environmental Intolerance (IEI)
  - Toxicant-Induced Loss of Tolerance (TILT)

- Can be combination genuine or somatic components

Chemical Sensitivities General
Reported Symptoms

- Headache
- Nausea
- Gastrointestinal changes
- Short term memory problems
- Difficulty concentrating
- Irritability
- Others

Statistics

- 12-16% sensitive
- 80% women
- Head trauma, severe infection, initial exposure to pesticides, concentrated VOCs, or moldy buildings
- Typically responds to fragrances, gasoline, diesel, smoke

Brain-Body connection

- Katerndahl and Miller 2005
  - Women in waiting room of health center approached, 40 with diagnosis of panic attacks chosen
  - 73% met criteria for chemical intolerance (QEEI)
  - 78% childhood abuse
  - 6% of controls met criteria for chemical intolerance
**QEESI**

- Dr. Claudia Miller
- 1999 QEESI introduced
- Self-report survey of symptoms and impact on life
- Takes into account masking of symptoms by daily activities

**Anatomy of Sensitivities**

- Trigeminal Nerve
  - Senses chemicals and sensations
  - Operates muscles in jaw
- Over-communication with brain – sensitivities
- Can be tested with capsaicin

**Perception**

![Graph showing number of reported symptoms by patients and controls for harmless and harmful chemicals, with true, false, and no information markers.](chart)
Newer Hypothesis – Sliding Scale

Organic and psychogenic components

Purely Organic  Purely Psychosomatic

- Sensory sensitivities
  - Touch
  - Sound
  - Vibration
  - Lights
  - Temperature/humidity

Common Indoor Contaminants

- Mold
- Radon
- Dust & mold mites
- Pests
- Combustion gases
- VOCs & chemicals
- Pet dander
- Indoor particulate matter
- Lack of ventilation
Common Outdoor Contaminants

- Pollen
- Pollution
- Other organic debris & particulate matter

Fungi

1. Cladosporium
2. Penicillium
3. Aspergillus
4. Chaetomium
5. Stachybotrys
6. Ulocladium
7. Trichoderma
8. Alternaria
9. Epicoccum
10. Aureobasidium

CLK estimates ~30 molds common indoors

Red = Dominant Outdoors
History

- 1994: Acute Ideopathic Pulmonary Hemosiderosis in Infants – CDC Report by Ruth Etzel, MD, PhD.
- Mold hits media
- 1999: Melinda Ballard lawsuit
- 2000: CDC report retracted

History Cont.

- 2001-present: Continued research by CDC, EPA, universities, physicians verifying health effects to damp buildings and microbial-contaminated buildings
Health Effects

- Allergies
  - ~10% of population
  - Delayed (vs. immediate) allergies prominent
  - Specific for mold species
- Asthma
- Infection
  - Rare – immunocompromised only
  - Irritation to mucous membranes

Health Effects – Toxic?

- ~2% Chronic inflammation
- Short-term memory impairment
- “Fogginess”
- Fatigue
- Muscle aches
- Others
- Likely not mycotoxins
- Multiple inflammmagens the cause

Dust and Mold Mites

- Dust Mite: Dermatophagoides farinae
  - D. pteronyssinus
- Der f 1, Der p 1, and Der P 2
- Mold Mite: Tyrophagus putrescentiae
Dust and Mold Mites

Tyrophagus
Mold Mite

Dermatophagoides
Dust Mite

Combustion Products

- Combusting gas produces
  - Irritant gases
  - Moisture
  - Carbon dioxide
  - Carbon monoxide

Combustion Products Cont.

- Unvented gas ovens
- Backdrafting water heaters or boilers
- Backdrafting furnaces
- Cracked heat exchangers
Many sources of volatile chemicals
• Cleaning agents
• Pressed and composite wood
• Carpeting on damp concrete
• Scented air fresheners
• Industrial processes
• Combustion sources
Measuring Volatile Chemicals

- Charcoal tubes and air pumps
- Suma canisters
- Photoionization detector
- 0-500 microgram per cubic meter of air (µg/m³) is normal
- Equivalent to ~250 parts-per-billion (ppb)

Thank you!
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