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Psychological aspects of “environmental illness,” “multiple chemical sensitivity,” and building-related illness

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Sections

- [Psychological Aspects of Environmental Illness and Mcs Syndrome](#)
- [Psychological Aspects of Building-Related Illness](#)
- [References](#)
- [Publishing and Reprint Information](#)

- [Previous article](#) in Issue
- [Next article](#) in Issue
- [Drug links](#) from Mosby's DrugConsult
- [Genetic information](#) from OMIM
- Citation of this Article
 - View on [PubMed](#)
 - Download in [citation manager format](#)
 - Download in [Medlars format](#)
- [Related articles](#) in PubMed

MCH Multiple chemical sensitivity

Certain persons have chronic complaints related to multiple organ systems for which there appears to be no adequate physical explanation. This point must be considered carefully in the differential diagnosis of alleged “environmental illness,” “multiple chemical sensitivity” (MCS) syndrome, and so-called building-related illnesses where no specific etiologic agent can be found and occasional outbreaks of mass psychogenic illness and fatigue-malaise syndromes have been reported.^{[1](#) [3](#)} Many such persons will seek consultative advice from several physicians and even from paramedical personnel because they are convinced that their symptoms signify some type of physical disturbance associated with exposure to an environmental factor(s) and undetected by

standard medical means.

Such patients can occupy a considerable amount of a consultant's time. This "subculture" of patients often finds solace in the clinical ecologist; they believe that the diagnostic methods and therapy used by clinical ecologists help to identify and treat their poorly understood conditions. The complex problems of these persons are compounded by the fact that their multisystem complaints are often attributable to the cumulative effects of stress and fear of future development of disease resulting from exposure to chemicals, additives, and antigens in the environment.

Irrespective of the patient's perception of the problem or ability to validate the situation objectively, the symptoms are nonetheless real and often alarming to the patient, who must be reassured when results of a complete history and physical examination, appropriate physiologic tests, and laboratory studies are normal. Test results must be discussed with the patient in detail and the validity and potential hazards of certain unproved diagnostic procedures and "treatments" candidly expressed when applicable. This is of particular importance when there are no objective findings to warrant such diagnostic tests and potential harmful effects from the use of unconventional and unproved forms of "therapy" might result.

Personality profiles of persons with multisystemic complaints alleged to be associated with exposure to small amounts of environmental chemicals in either outdoor or indoor environments are often markedly abnormal, indicating deeply rooted psychoneurotic problems with features of depression, hysteria, somatization symptoms, and little insight into their problems. These patients may have been evaluated previously by clinical ecologists and referred by another physician or by a defendant corporation to a certified internist/allergist for a second opinion because of diagnostic uncertainty or dispute. Because exposure to small amounts of environmental chemicals may theoretically cause stimulation of the immune system (leading to hypersensitivity reactions or autoimmunity) or suppression (leading to infection or neoplasia), this type of exposure has also allegedly been reported to result in abnormal laboratory tests of humoral or cellular immune system function. Usually persons with such exposure manifest no physical signs characteristic of any classic immune deficiency or hypersensitivity disease.

In these cases, one must reassure the patient but accept the condition as chronic even though the causes of the multiple symptoms are not known and the symptoms are strongly suggestive of deep-seated neurotic disturbances.⁴ Appropriate psychiatric consultative advice should be considered for many of these persons, and the physician should discourage the patient from avoiding exposure to wide ranges of substances and conditions present in the normal indoor or outdoor environment that severely limit that patient's functioning and induce more fear and apprehension. This approach will not cure the patient or solve the problems, but if a complete evaluation is not made and the patient is neglected, he or she will often continue to seek further treatment that will likely be of no benefit. Morbid phobias or fears of the environment may also persist, and the patient may undergo further physical harm as a result of futile attempts to avoid multiple perceived offending substances in the indoor or outdoor environment.

The fact that there is a disparity between the occurrence of symptoms involving multiple organ systems and the lack of pathophysiologic findings suggests to some scientists that so-called "MCS

syndrome” and “environmental illness” should be classified among the group of somatoform disorders.* Such disorders may manifest as conversion disorders, hypochondriasis, or somatization disorders.⁵ Patients with these disorders often seek or even demand expensive diagnostic procedures to uncover “diseases” and frequent, unnecessary surgery to manage their perceived organic diseases. Others may claim exquisite clinical “sensitivity” to many chemicals and pollutants in the ambient or workplace environment.

It is known that many persons with common respiratory tract allergic disease (rhinitis and asthma) experience chronic mucosal inflammation and IgE-dependent “late phase” reactivity to common inhalant allergens. This is manifested as bronchial or nasal hyperirritability on exposure to a variety of odors, cooking smells, and “chemicals” such as household cleaning agents, cigarette smoke, perfumes, exhaust fumes, insecticide sprays, soap and detergent powders, and other irritants. Some investigators believe that MCS may reflect an airways dysfunction or hyperreactivity

syndrome with manifestations outside of the lower airways.⁶ This belief is based on the finding of extensive upper airway inflammation with basement membrane thickening and abnormalities of respiratory epithelium in patients who claim to be sensitive to multiple irritants such as those previously mentioned. Symptoms in these patients are, however, still limited to the upper and lower respiratory system as opposed to the wide spectrum of symptoms involving multiple organ systems noted in MCS and alleged “environmental illness.” Thus patients with asthma and rhinitis who have secondary hyperreactive airways symptoms should not be confused with those who allege multiple, vague symptoms related to a large number of organ systems.

Other patients may possibly have a very low threshold for perceiving odors or reacting to irritants (an amplification of normal bodily sensations) and may incorrectly attribute this lower sensitivity threshold to a true allergic mechanism. Indeed, it is known that there is considerable variation in detecting odors or experiencing irritant symptoms on exposure to many of the aforementioned substances at the mucosal level. In view of the role of the olfactory system in communicating information concerning the chemical environment to the brain and, ultimately, to all body organs,

Bell⁷ has proposed an olfactory-limbic system model as a mechanism for the neuropsychiatric and biopsychosocial phenomena observed in MCS. This theory implies that at low concentrations, chemicals can influence brain activity, leading to the type of physiological and behavioral reactions noted in persons with alleged MCS.

Yet other persons who manifest such vague multisystemic symptoms may have primary psychiatric disorders such as depression complicated by multiple somatic symptoms, phobias, and anxiety. Many symptoms of alleged “environmental illness” are similar to those of anxiety and related neurotic reactions (i.e., tachycardia, dizziness, light-headedness, gastrointestinal upset, and fatigue), and most of the population-at-large are known to experience some of these common symptoms occasionally and transiently. Some persons may simply amplify and prolong symptoms after their onset, resulting in an exaggerated response. Thus some investigators have concluded that psychological vulnerability strongly influences the belief that “chemical sensitivity” has been

developed after exposure to low doses of environmental chemicals.⁸ A report by Terr⁹ revealed that 31 of 50 patients who had been diagnosed by clinical ecologists as having environmentally related illness had noted such long-standing multisystemic complaints of probable psychological origin involving many organ systems.⁹ Psychological and psychiatric consultation and evaluation should be considered in many of these cases.

Most patients with diagnoses of “environmental illness” continue to have worsening symptoms. This suggests that making such a diagnosis may not help the patient and may possibly lead to iatrogenic harm by encouraging further environmental and social isolation and functional disability. Neglecting psychiatric and psychological consultation may also ultimately prevent these individuals from accepting the fact that relief of symptoms through unproved forms of therapy may not be attainable.

Psychological Aspects of Building-Related Illness

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Psychological factors are usually not prominent in the building-related diseases where an identifiable specific etiologic agent(s) is found and patients have a uniform clinical picture such as an infectious disease (Legionnaires), hypersensitivity pneumonitis, or bronchial asthma. In building-related illness where no specific etiologic agent can be found and either nonspecific “annoyance” or “mucus membrane irritation” symptoms are noted, employers often do not initially take the worker's complaint seriously. This can lead to considerable frustration and anger on the part of employees. As in any type of self-reported illnesses, particularly those that are work-related, many factors, including the nature of the work environment, continued performance of dull, repetitive office tasks or procedures, peer group interactions, and the individual worker's perception of health versus disease, are important and influence the reported symptoms. Several different psychosocial factors

probably play a role in the appearance of building-related illnesses.¹⁰ Among these factors are the following: (1) The extensive coverage of such outbreaks by the news media; (2) the increasing emphasis on chemical hazards in the environment at large and on sources of indoor air pollution, such as cigarette smoking, which have become important public health concerns; (3) a marked increase in the number of persons working in indoor office or nonindustrial type environments because our economy has shifted from traditional older outdoor industrial type work to indoor service sector types of employment; and (4) the multiple technologic changes in office work involving the use of printers, computers, display screens, and copying machines, all of which have increased the number of routine, repetitive, detailed tasks to be performed by workers and have possibly resulted in increased stress. Possibly the most common type of symptoms in building-related problems are simple annoyance and mucous membrane-type symptoms, among which are conjunctival irritation, lacrimation, nasal congestion, sneezing, dry throat, nonproductive cough, headache, fatigue, chest tightness, nausea, dizziness, drowsiness, and difficulty wearing contact

lenses.^{10, 11} Such symptoms are usually minor and transient and are often interpreted by employers as only a nuisance of little importance. This can lead to considerable frustration on the part of the employees, who can easily believe that their symptoms are being interpreted as psychosomatic rather than “real.” Whether these symptoms are organic or merely perceived, they are nonetheless real to the office worker. In several instances some of these complaints have been traced to aggravating or annoying factors present in the workplace such as strong odors, excessive tobacco smoking, or changes in building temperature or humidity. Thus many of these minor annoying irritation complaints may theoretically be related to a heightened sense of olfactory awareness on the part of certain persons or a lowered threshold of irritant receptor responsiveness. In other instances, one or more workers may knowingly or unknowingly instigate unwarranted concerns in other workers. These concerns may then result in an emotional chain reaction, leading to an industrial outbreak of mass psychogenic illness. This situation can particularly occur in industries with strict authoritarian administrations where work is especially repetitive and boring, resulting in unusual repetitive and recurrent stresses. For example, there may be a generalized belief that some type of toxic substance is present in the atmosphere of a building after a precipitating event, such as when certain workers smell a strong odor. This may in turn result in a threat that some type of

disease may appear, followed by psychological arousal symptoms such as dizziness, anxiety, or syncope and, ultimately, "contagion" of multiple symptoms among many workers. Alexander and Fedoruk¹² have reported such forms of epidemic psychogenic illness in a telephone operators' building in 1986. Similar episodes have been reported by Olkinuora¹³ in the Scandinavian literature and by Boxer¹⁴ in the United States. The complexity and the lack of knowledge in this general use are illustrated by the fact that such outbreaks of epidemic psychogenic illness have abated at times when improvements were made in the ventilation system, even though careful monitoring of air contaminants revealed no specific causative agent. This suggests that it may be difficult to make such a diagnosis solely on the exclusion of a role for any airborne biologic, microbial, or chemical agent. Guidotti et al.¹⁵ have listed several epidemiologic features that might be used to help differentiate between building-associated illness caused by chemical exposure and that with a psychogenic origin. Among these features are the following: (1) A time sequence of cases inconsistent with ventilation flow rates; (2) the absence of consistent findings in the patient's history and physical examination that are compatible with exposure to environmental toxins; (3) the presence of symptoms associated with hyperventilation or hysteria in a large number of subjects; (4) characteristic personality profiles and age/sex distribution among patients; (5) a shifting incidence of cases in space inconsistent with ventilation flow patterns; (6) an epidemic curve that is consistent with person-to-person rather than "common source" transmission; (7) a relapse of illness in the setting of the original outbreak; and (8) evidence of unusual physical or psychological stress acting on the workers.

These types of epidemiologic features can, at times, help greatly in diagnosing outbreaks of office-related illness. They are, however, often limited because of the difficulties involved in defining a specific case on the basis of any type of objective criteria (which are usually absent). A physician evaluating these cases on an individual basis should also realize that many of the symptoms expressed by these persons can be the physiologic concomitants of fear and anxiety. For example, symptoms related to autonomic nervous system hyperactivity such as palpitation, flushing, tachycardia, dizziness, and dyspnea are experienced by most normal persons under situations that provoke fright or fear. Other symptoms such as fatigue, malaise, and weakness often follow these situations. Once a person begins to believe that these symptoms are indicative of an organic disease or, worse yet, are related to exposure to some toxic chemical rather than representing a normal change in physiologic function, their fears and anxiety can worsen and symptoms can become amplified, leading, at times, to disability.

The allergist and clinical immunologist should be aware of these many factors influencing the production of alleged building-related symptoms. Because the physician often plays a crucial role in recognition and evaluation of patients with such symptoms, a thorough knowledge base in this area is mandatory. We have much to learn about the possible effect of chemicals and related pollutants in low-level quantities and the health of office workers confined to office buildings. We also have little knowledge about the effects of exchange rates of indoor and outdoor air on accumulation of indoor chemicals and pollutants. For example, it has been hypothesized that in mechanically ventilated buildings, symptoms arise because the concentration of pollutants from indoor sources increases when the supply of outdoor air is reduced. However, a well-controlled study has shown that increasing the supply of outdoor air does not affect workers' perceptions of their office environment or their reporting of symptoms considered typical of building-related illness. Thus sound objective data must be obtained and made available so that proper methods to ensure and enforce logical recommendations and regulations for the general environment of buildings can be better developed. This type of information will be even more crucial in the future as we gradually

shift from an era predominated by blue-collar outdoor industrial workers to one dominated by large populations of indoor office workers. The amount of work performed in artificially humidified, temperature-controlled and ventilated environments and exposure to indoor agents such as microbial contaminants from building materials, chemical contaminants from the interior buildings, and other indoor volatile organic compounds will probably continue to increase. Thus it will become more important for the physician to properly diagnose building-related symptoms as the result of identifiable organic diseases, simple annoyance, and irritative mucous membrane syndromes or neuropsychiatric/epidemic psychogenic phenomena. In any event, the diagnosis of mass psychogenic illness in an office population should not be made without careful consideration of the epidemiologic features known to help in establishing a proper differential diagnosis and a thorough search for all possible organic causes of symptoms. It is also important to remember that even when there is an identifiable organic cause, sociopsychologic factors are still important in these outbreaks. Indeed, it is very likely that a combination of physical, microbial, chemical, psychological and other factors all collectively contribute toward stress and possible adverse health effects in many of these persons.

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