

A close look at

**“Multiple
Chemical
Sensitivity”**

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Executive Summary

The expression “multiple chemical sensitivity” (“MCS”) is used to describe people with numerous troubling symptoms attributed to environmental factors. Many such people are seeking special accommodations, applying for disability benefits, and filing lawsuits claiming that exposure to common foods and chemicals has made them ill. Their efforts are supported by a small cadre of physicians who use questionable diagnostic and treatment methods. Critics charge that these approaches are bogus and that MCS is not a valid diagnosis. This report examines the MCS phenomenon and the scientific, legal, ethical, and political issues that surround it.

Practitioners who promote MCS as a diagnosis claim that it is caused by extremely low levels of chemical substances found in the environment. However, no scientific tests have ever been able to detect an organic basis for the diagnosis, and no major medical organization recognizes MCS as a clinical disease. Instead of testing their claims with well-designed research, its advocates are promoting them through publications, talk shows, support groups, lawsuits, and political maneuvering.

Many people diagnosed with “MCS” suffer greatly and are difficult to treat. Well-designed investigations suggest that most of them have a psychosomatic disorder in which they react to stress by developing multiple symptoms. Many of these patients are financially exploited and discouraged from seeking proper medical and psychiatric care. In addition, insurance companies, employers, educational facilities, homeowners, other taxpayers, and ultimately all citizens are being burdened by dubious claims for disability and damages.

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About the Author

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The expression “multiple chemical sensitivity” (“MCS”) is used to describe people with numerous troubling symptoms attributed to environmental factors. Many such people are seeking special accommodations, applying for disability benefits, and filing lawsuits claiming that exposure to common foods and chemicals has made them ill. Their efforts are supported by a small cadre of physicians who use questionable diagnostic and treatment methods. Critics charge that these approaches are bogus and that MCS is not a valid diagnosis. This report examines the MCS phenomenon and the scientific, legal, ethical, and political issues that surround it.

What Is MCS?

MCS is an unproven diagnosis used by a small number of practitioners—some of whom call themselves clinical ecologists—to explain a vast array of common, everyday symptoms. Practitioners who promote MCS as a diagnosis postulate that it can be caused by extremely low levels of chemical substances found in the environment. However, no scientific tests have ever been able to detect an organic basis for the diagnosis, and no major medical organization recognizes MCS as a clinical disease.

Clinical ecology theory is not taught at any of the mainstream medical colleges or universities; rather, it was developed by allergist Theron G. Randolph, M.D. (1906–1995), who asserted that patients had become ill from exposures to substances at doses far below the levels normally considered safe. In the 1940s, he declared that allergies cause fatigue, irritability, behavior problems, depression, confusion, and nervous tension in children.^{1,2} During this period, he practiced full-time in Chicago and became a staff member of the Northwestern University Medical School and two affiliated hospitals. The foreword to his book *An Alternative Approach to Allergies* indicates that he was charged with being “a pernicious

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influence on medical students” and subsequently lost his medical school position and hospital privileges.³

In the 1950s, Randolph suggested that human failure to adapt to modern-day synthetic chemicals had resulted in a new form of sensitivity to these substances.⁴ His concern with foods then expanded to encompass a wide range of environmental chemicals. Over the ensuing years, the condition he postulated has been called allergic toxemia, cerebral allergy, chemical sensitivity, chemical hypersensitivity syndrome, ecologic illness, environmental illness (EI), environmental irritant syndrome, environmental maladaptation syndrome, environmentally induced illness, immune system dysregulation, multiple chemical sensitivity, multiple chemical sensitivity syndrome, total allergy syndrome, total environmental allergy, total immune disorder syndrome, toxic encephalopathy, toxic response syndrome, 20th Century disease, universal allergy, and other names that suggest a variety of causative factors. This multiplicity of names reflects the inability of Randolph’s disciples to meaningfully define the condition they postulate.

The complaints associated with these labels include depression, irritability, mood swings, inability to concentrate or think clearly, poor memory, fatigue, drowsiness, diarrhea, constipation, dizziness, mental exhaustion (also called “brain fog” or “brain fag”), lightheadedness, sneezing, runny or stuffy nose, wheezing, itching eyes and nose, skin rashes, headache, chest pain, muscle and joint pain, urinary frequency, pounding heart, muscle incoordination, swelling of various parts of the body, upset stomach, tingling of the fingers and toes, and psychotic experiences associated with schizophrenia. Proponents claim that virtually any part of the body can have elusive symptoms for which no organic cause can be found. William J. Rea, M.D., who says he has treated more than 20,000 environmentally ill patients, states that they “may manifest any symptom in the textbook of medicine.”⁵ Another like-minded practitioner has said that “MCS patients may well be the human ‘canaries’ on an increasingly poisoned planet.”⁶

Many MCS proponents assert that: (1) although one substance may not have an effect, low doses of different substances can add to or multiply one another’s effects; (2) hypersensitivity develops when the “total body load” of physical and psychologic stresses exceeds what a person can tolerate; (3) once the process of chemical sensitivity begins, new sensitivities can develop rapidly and from increasingly small exposures; (4) patients often crave and become addicted to foods that make them ill; (5) changes in the degree of exposure can affect the degree of sensitivity to offending

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substances; (6) hypersensitivities may be related to “immune system dysregulation” or “immunotoxicity” that can be difficult to diagnose and treat; and (7) exposure to environmental pollution often makes people generally susceptible to disease. Some proponents inform patients that they have “an AIDS-like illness.” None of these speculations is consistent with scientific knowledge of human physiology, allergy and immunology, pathology, toxicology, or clinical medicine.

Many MCS proponents suggest that the immune system is like a barrel that continually fills with chemicals until it overflows and symptoms appear. Rea uses pictures of overflowing barrels to illustrate his concept of “pollution overload.”⁷

Most physicians who diagnose and treat MCS identify themselves as “clinical ecologists” or “specialists in environmental medicine.” Clinical ecology is not a recognized medical specialty, is not advocated by standard medical textbooks, and is not a component of medical school or specialty training programs. Environmental medicine and occupational health are components of the specialty of preventive medicine, but the theories and practices of clinical ecology are not. To avoid confusion, I refer to advocates of these theories and practices as “clinical ecologists,” even though some of them don’t describe themselves this way.

Critics of clinical ecology charge that: (1) MCS has never been clearly defined, (2) no scientifically plausible mechanism has been proposed for it, (3) no diagnostic tests have been substantiated, and (4) not a single case has been scientifically validated.⁸ For these reasons, MCS is not listed as a diagnosis in standard medical textbooks or the *International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM)*, which is the standard manual used for classifying medical conditions.

Is MCS Definable?

Clinical ecologists promote their theories freely, but they have been unable or unwilling to back them up with legitimate, double-blind, peer-reviewed, studies. Why? That’s a good question. Many clinical ecologists claim that they lack the financial resources to conduct such studies. However, critics assert that these practitioners can easily afford to conduct such studies using their existing patient base.

Another factor complicating research into the MCS phenomenon is the lack of a clear definition of MCS. Logic dictates that meaningful research on a condition cannot be conducted until criteria for diagnosing it

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can be clearly defined. Several definitions of MCS and its synonyms have been proposed, but none has met this standard. For example, the American Academy of Environmental Medicine (a proponent group) states:

Ecologic illness is a polysymptomatic, multi-system chronic disorder manifested by adverse reactions to environmental excitants as they are modified by individual susceptibility in terms of specific adaptations. The excitants are present in air, water, drugs, and our habitats.

In 1985, the ad hoc Committee on Environmental Hypersensitivity Disorders of the Ontario Ministry of Health consulted proponents and reviewed their literature with the hope of defining “environmental hypersensitivity.” Although skeptical of clinical ecology’s tenets, the committee developed this “working definition”:

Environmental hypersensitivity is a chronic (i.e., continuing for more than three months) multisystem disorder, usually involving symptoms of the central nervous system. Affected persons are frequently intolerant to some foods and they react adversely to some chemicals and to environmental agents, singly or in combination, at levels generally tolerated by the majority. Affected persons have varying degrees of morbidity, from mild discomfort to total disability. Upon physical examination the patient is normally free from any abnormal, objective findings. Although abnormalities of complement and lymphocytes have been reported, no single laboratory test, including serum IgE, is consistently altered. Improvement is associated with avoidance of suspected agents and symptoms recur with re-exposure.⁹

The label “multiple chemical sensitivity” was coined by Mark Cullen, M.D., professor of occupational medicine at Yale University, who does not identify himself as a clinical ecologist. In a 1987 report, he suggested seven diagnostic criteria: (1) the onset of the problem can be related to one or more documentable environmental exposures, insults, or illnesses; (2) symptoms involve more than one organ system; (3) symptoms recur and abate in response to predictable stimuli; (4) symptoms are elicited by exposures to chemicals of diverse structural classes and toxicologic modes of action; (5) symptoms are elicited by exposures that are demonstrable; (6) exposures that elicit symptoms must be very low (far below average levels known to produce adverse human responses); and (7) no single widely available test of organ-system function can explain the symptoms.¹⁰

The above definitions differ greatly from those of medically recognized diseases such as diabetes, rheumatoid arthritis, and coronary heart

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disease, each of which is associated with a clear-cut history, physical findings, and laboratory tests. With MCS, however, the range of symptoms is virtually endless; the onset can be abrupt or gradual and may or may not be linked to any specific exposure or causative factor; and symptoms can vary in intensity, can come and go, and typically do not correlate with objective physical findings and laboratory results.

Dubious Diagnosis

The fact that MCS has not been meaningfully defined does not deter clinical ecologists from diagnosing it—typically in all or nearly all of their patients. Their diagnostic evaluation usually includes an “ecological oriented history,” a physical examination, and laboratory tests. However, the diagnosis may be based entirely on what the patient reports.

The history-taking procedure may include a lengthy questionnaire that emphasizes dietary habits and exposure to environmental chemicals.

The nature and purpose of the physical examination are unclear. Rea’s book *Chemical Sensitivity: Tools of Diagnosis and Methods and Treatment*, for example, does not specify how the examination should be done. The book states that hives, eczema, bleeding into the skin, bruises, edema (swelling of the skin), and coldness of hands and feet, are “extremely common signs,” and that “holes in the fingernails, ridges and white spots on the nails, and hangnails are often present.” Rea also says that MCS patients often exhibit bad breath, belching, mouth ulcers, abdominal tenderness, tenderness over the bladder, back tenderness, vaginal discharge, prostate tenderness, acne, and many other physical findings and illnesses.⁵ The book claims that “pallor of the skin, which ranges from pale to deep yellow,” is pathognomonic (a definite sign) of chemical sensitivity and appears in most MCS patients. Besides that, he lists no physical sign or combination of signs that is specific to MCS. Actually, there is no reason to believe that chemical sensitivity is a likely cause of skin pallor or any of the other symptoms that Rea mentions.

Some standard laboratory tests may be performed, mainly to rule out other causes of disease. Standard allergy test results are often normal.

The test clinical ecologists consider most important is a questionable test called provocation-neutralization. During this procedure, the patient is asked to report any symptoms that develop after various concentrations of suspected substances are administered under the tongue or injected into the skin. If symptoms occur, the test is considered positive and various

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concentrations are given until a dose is found that “neutralizes” the symptoms. Various other chemicals, hormones, food extracts, and other natural substances may be prescribed as “neutralizing” agents.

“Neutralization” superficially resembles the desensitization process used by allergists. However, allergists test and treat with substances that produce objective, measurable allergic responses, whereas clinical ecologists base their judgments on subjective responses (what the patient reports).

Clinical ecologists differ about how provocation and neutralization should be done.¹¹ The observation period is generally said to be ten minutes, but reported times have ranged from 7 to 90 minutes. Whereas some practitioners increase the amount of the test substance in the “neutralizing” dose, others lower it. Rather than devise and test standard protocols, clinical ecologists have generally relied on personal experience, testimonials, and anecdotal evidence. Moreover, they accept test results without establishing whether they are consistent or reproducible.

After reviewing the test records of MCS patients, toxicologist William J. Waddell, M.D., reported that the following responses were considered evidence of sensitivity: “yawn, burp, sniffle, raw throat, face pressure, muscle tremor, itch, droopy eye muscle, burning feeling, eye twitch, woozy head, eye itch, sleepy, less sleepy, cough, nervous, headache, lousy feeling, heart pounding, feel bad, neck noise, groggy, restless legs, and weak.” He noted that the responses could differ from one test to another with the same chemical and had no objective significance:

The salient problem with MCS is that there is no consistent and specific effect from exposure to any specific chemical. This does not allow for any objective test for any disease entity which might be caused by the chemicals as indicated by the theory of MCS. The effects of exposure to chemicals as defined today by MCS are subjective, and no report is available to convincingly demonstrate that these effects would not have occurred merely by chance.¹²

Waddell also concluded: (1) the MCS hypothesis (exposure to any chemical may or may not produce any illness after exposure to the same or any other chemical) was not specific enough to be testable, (2) the hypothesis contradicts fundamental principles of toxicology, (3) current testing procedures for MCS are so subjective that they are useless, (4) there is no evidence that the responses attributed to MCS differ from those that would occur merely by chance, and (5) the MCS literature attaches an emotional bias to chemicals.

Many clinical ecologists use tests related to immune function or

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exposure to specific chemicals. Samples of blood, urine, fat, and hair may be examined for various environmental chemicals, the most common of which are organic solvents, hydrocarbons, pesticides, insecticides, and heavy metals. Other blood tests may assess immunoglobulins, other immune complexes, lymphocyte counts, and “antipollutant enzyme” levels.¹³ Some of these tests lack an accepted protocol and have not been standardized, and none has been demonstrated to have a consistent pattern of alteration in MCS patients.¹⁴

Elimination and rotation diets may be used with the hope of identifying problematic foods. An elimination diet may begin with a one-week “washout” or fast during which only spring water is consumed. Single-food challenges may also be used.

In severe cases, Rea’s patients may spend several weeks in an environmental care unit (ECU) intended to remove them from exposure to airborne pollutants and synthetic substances. After fasting for several days, these patients are given “organically grown” foods and gradually exposed to environmental substances to see which ones cause symptoms to recur.

During the 1980s, Canadian investigators who examined the files of 2,000 of Rea’s patients reported that only four had tested negative for environmental sensitivity, and those four were found to have cancers. The reviewers concluded that Rea’s test procedures lacked appropriate controls and the patients were assumed to have environmental hypersensitivity mainly by being referred to the unit.¹⁵

Some programs are based on blood tests that can detect chemicals in concentrations of parts per billion. This enables levels too low to be clinically significant to be misinterpreted as evidence of unusual and harmful chemical exposure.¹⁶ If any “toxin” level is interpreted as abnormal, the patient will be advised that “detoxification” or “purification” can wash the undesirable chemicals from the body. The regimens may include exercise, sauna treatments, showers, massage, herbal wraps, megavitamin therapy (usually including several grams of niacin per day), self-administered “desensitization” injections, and the use of water and air purifiers.^{17,18} An astute reporter has pointed out that people can’t sweat out toxins because the sweat glands are not connected to the liver or any other organ that process toxins.¹⁹ Moreover, high doses of niacin tend to interfere with detoxification by the liver.

Some clinical ecologists claim that PET or SPECT scans can detect brain abnormalities caused by exposure to environmental substances. The Society of Nuclear Medicine Brain Imaging Council disagrees.²⁰

A few practitioners who consider themselves clinical ecologists use a

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fancy galvanometer to diagnose “energy imbalances” or “allergies” and select homeopathic remedies or other products to correct the alleged problems. These devices merely measure the electrical resistance of the skin, which reflects how moist it is and how hard the operator presses a probe against the patient’s skin. Skin moistness is easily influenced by emotions, but the most important factor is how hard the probe is pressed. The test results have nothing whatsoever to do with allergies, chemical sensitivities, the state of the patient’s health, or any type of energy imbalance. Although the FDA considers such devices “a significant risk” to the public, it has done little to curb their use.

Two scientific studies have demonstrated that provocation testing is not valid. Both found that patients reacted similarly to the test substances and placebo.

In 1971, two researchers reported on tests performed by five experienced clinical ecologists. Each of the patients had tested positive during provocation testing with special preservative-free extracts of food or alcohol, the contents of which were known to the clinical ecologist. During the experiment, the clinical ecologist was handed either the extract or a dilute saltwater solution (saline), the contents of which were known only to another physician who observed but did not participate in the procedure. Based on the patient’s reactions, the clinical ecologists were then asked to judge whether the administered material was the extract or the placebo. The extracts were correctly identified in 24 of 34 trials (70.6%). However, the saltwater solution relieved the patient’s symptoms in 28 of 40 trials (70%), indicating that symptom relief was not related to any allergy-causing substance in the extracts.²¹

In the early 1980s, researchers at the University of California (UC) observed similar test results in a study funded by the Society for Clinical Ecology and the American Academy of Otolaryngic Allergy (another proponent group). The tests took place in the offices of seven clinical ecologists who had been treating the patients. During three-hour sessions, the patients received three injections of suspected food extracts and nine of normal saline. Sixteen patients were tested once, and two were tested twice. In nonblinded tests, these patients had consistently reported symptoms when exposed to food extracts and no symptoms when given saline injections. Under double-blind conditions, however, they developed symptoms with 16 (27%) of the food-extract injections and 44 (24%) of the saltwater injections. The symptoms elicited by both types of injections were identical and included itching of the nose, watery or burning eyes, plugged ears, a feeling of fullness in the ears, ringing ears, dry mouth, scratchy

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throat, an odd taste in the mouth, tiredness, headache, nausea, dizziness, abdominal discomfort, tingling of the face or scalp, tightness or pressure in the head, disorientation, difficulty breathing, depression, chills, coughing, nervousness, intestinal gas or rumbling, and aching legs. The results clearly demonstrated that the patients’ symptoms were placebo reactions. The study also tested the claim that “neutralizing” doses of offending allergens can relieve the patient’s symptoms. All seven patients who were “treated” during the experiment had equivalent responses to extracts and saline. The researchers noted:

It is regrettable that every patient undergoing challenge or provocative testing is not tested in a double-blind fashion so that the effect of suggestion or anxiety on the end points could be evaluated. If they were so tested, the problems with the validity of the method that we found would have been discovered decades ago.²²

Don L. Jewett, M.D., who led the UC study, provided additional perspective at a 1992 conference on MCS:

Some may find it unusual that an orthopedic surgeon has had clinical and investigative experience with the hypersensitivity syndrome. My experience occurred in three ways: as a patient, as a treating physician, and as a scientific investigator. As a patient, I have had lifelong allergies, which became worse during an especially difficult period of my life. Traditional allergy shots produced some mild, but unsustained, improvement. I then started treatment under a clinical ecologist and ultimately spent five weeks in a Dallas environmental control unit. I ended with a diagnosis of “universal reactor,” 70 different injection substances, and a change (but not a decrease) in symptoms. . . .

After this I began seeing patients in a “sensitivity clinic” that I ran within the Orthopedic Clinic at the University of California, San Francisco. I treated patients with diet changes (four-day rotation diet). Some patients seemed to experience significant positive effects. Such results encouraged me to formulate a long-range plan to definitively prove the hypothesis that small amounts of substances to which we are commonly exposed can result in symptoms (at least in some patients at some times). Because the expected positive result was likely to have a significant impact on medical practice, I devised a scientifically rigorous study that both proponents and opponents agreed was a fair and appropriate double-blind test of symptom provocation by injections. However, the study showed provocation testing to be totally unreliable as a method for determining sensitivity, and so I began to doubt the validity of this diagnostic and therapeutic approach. . . .

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My role as an investigator is limited to the above-cited study because proponents immediately dropped association with me when the negative results were presented to a national meeting of the Society for Clinical Ecology.

Jewett later observed that patients who described their most troubling problems as interpersonal often did well with counseling, but most who considered their problem physical did poorly because they found it “difficult or impossible to stop their compulsive search for a medical or technological solution to their problem.”²³

Allergist John C. Selner, M.D., and psychologist Herman Staudenmayer, Ph.D., of Denver, Colorado, have treated “MCS” patients for more than 17 years. They are not clinical ecologists and reject clinical ecology theories and practices. They believe that although some people are very sensitive to various microorganisms, noxious chemicals, and common foods, there is no scientific evidence that an immunologic basis exists for *generalized* allergy to environmental substances. Using well-designed double-blind tests, they have demonstrated that people said to be “universal reactors” may develop multiple symptoms in response to test procedures without being allergic to any of the individual substances administered. One of their reports describes how they used an environmental chamber to evaluate 20 patients who had multiple symptoms attributed to hypersensitivity to workplace and domestic chemicals. These patients believed that they were reactive or hypersensitive to low-level exposure to many chemicals. Some had previously been evaluated and managed by clinical ecologists and diagnosed with MCS. During nonblinded tests, these patients consistently reported symptoms they had associated with exposure at work, at home, or elsewhere.

The environmental chamber enabled the patients to encounter measured amounts of purified air, compressed gasses, and air containing specific chemical concentrations, without knowing which situation was which. During the controlled test periods, patients were randomly exposed to: (1) chemicals to which they believed they were sensitive; (2) the same chemicals with their odors masked by another odor such as peppermint spirit, anise oil, cinnamon oil, or lemon oil; (3) just the odor used for masking; or (4) clean air. A total of 57 active and 88 sham challenges were performed. After each test period the patients were asked whether they thought they had been exposed to a suspected chemical or to clean air. The patients were monitored for objective signs (such as skin reactions) and were also asked to report symptoms experienced during the test and up to three days later. None of the 20 patients demonstrated a response pattern

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implicating the chemicals supposedly responsible for their symptoms. Eighteen reported no symptoms at least once when the suspect chemical was present. Fifteen reported symptoms at least once when the suspect chemical was absent.²⁴ In other words, many MCS patients react to their feelings about the test, rather than to the substance in question.²⁵

Dubious Treatment

The treatment clinical ecologists offer is as questionable as their diagnoses. One observer has commented that the variety of treatments they prescribe “seems limited only by their imagination and resourcefulness.”²⁶ The usual approach emphasizes avoidance of suspected substances and involves lifestyle changes that can range from minor to extensive. Generally, patients are instructed to modify their diet and to avoid such substances as scented shampoos, aftershave products, deodorants, cigarette smoke, automobile exhaust fumes, and clothing, furniture, and carpets that contain synthetic fibers. Extreme restrictions can involve wearing a charcoal-filter mask, using a portable oxygen device, staying at home for months, or avoiding physical contact with family members. Many patients are advised to take vitamins, minerals, and other dietary supplements. “Neutralization therapy,” based on the results of provocative tests, can involve administration of chemical extracts under the tongue or by injection.

Two sociologists who have suggested that MCS is chemically induced have described a common MCS mindset:

People with MCS . . . believe that at any moment their relative state of illness and wellness is a function, in part, of the activities and practices in others. Important, perhaps critical, to a person’s management of MCS is her ability to persuade other people that they are partly responsible for her misery and must change if she is to successfully manage her symptoms. People with MCS must narrate their symptoms in order to survive.²⁷

MCS patients typically portray themselves as immunologic cripples in a hostile world of dangerous foods and chemicals and an uncaring medical community. In many cases, their life becomes centered around their illness. Various companies cater to these beliefs by offering such items as “organic” foods; odor-free personal products; special clothing, household products, and building materials; and even specially outfitted travel trailers. A recent article in *Reason* described how one woman wore a protective mask while shopping and another woman hung her mail on a

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clothesline for weeks before reading it, to allow the “toxins” in the ink to dissipate.¹⁹

The American Environmental Health Foundation’s 1995 catalog offers air filters, bedding, educational materials, paints, building materials, children’s supplies, clothing, ecological masks, electromagnetic shielding, “full spectrum” lighting, furniture, oxygen masks, personal air purifiers, pet supplies, pollution detection kits, reading boxes (outfitted with an exhaust fan to suck away gasses presumably emitted from a newspaper, typewriter, or laptop computer), saunas, water filtration systems, water test kits, and more than 150 dietary supplement products. The supplements are said to be hypoallergenic and made by manufacturers who use “the purest products and methods . . . and, wherever possible, use organically grown plants for their sources.” The products include *Mood Elevator*, *Powder Carrots*, *Powder Potato*, and two brands of shark cartilage.

An ad in the American Academy of Environmental Medicine’s 1996–1997 membership directory offers homeopathic products for “stress, both physical and emotional,” “cellular repair,” and “organ•systems clearing and specific biotoxin eradication i.e., chemicals, metals, viruses.” The manufacturer, HVS Laboratories of Naples, Florida, states that “every one of your patients is affected by these cell damaging toxins.” The products are said to be prepared “electromagnetically,” to “add to the electromagnetic vitality of the body,” and to “complement all other modalities.” HVS recommends “clearing” the patient at least annually, but states that some practitioners prescribe weekly “preventive” doses “in an effort to minimize toxic buildup.”²⁸ Homeopathic products have no proven value for any health problem (see Glossary).

Critical Scientific Reports

Many prominent professional organizations and scientific panels have concluded that clinical ecology and its associated concepts are—at best—speculative and unproven.

- The California Medical Association Scientific Board Task Force on Clinical Ecology conducted an extensive literature review and held a hearing at which proponents testified. Its report states: (1) no convincing evidence supports the hypotheses on which clinical ecology is based; (2) clinical ecologists have not identified specific, recognizable diseases caused by low-level environmental stressors; and (3) the methods used to diagnose and treat such undefined conditions have not been proven effective. The

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task force concluded that “clinical ecology does not constitute a valid medical discipline” and should be considered “experimental” only when its practitioners adhere to scientifically sound research protocols and inform their patients accordingly. The task force also expressed concern that unproven diagnostic tests can lead to misdiagnosis, which results in patients being denied other supportive treatment, becoming psychologically dependent, and believing they are seriously and chronically impaired.²⁹

- The ad hoc Committee on Environmental Hypersensitivity Disorders established by the Minister of Health of Ontario, Canada, received submissions, heard testimony from many professionals and laypersons, observed practitioners at work, and issued a 500-page report evaluating the concepts of clinical ecology.⁹ An expert panel then reviewed this report and concluded that “scientific support for the mechanisms that have been proposed to underlay the wide variety of dysfunctions are at best hypothetical. Moreover, the majority of techniques for evaluating the patients and the treatments espoused are unproven.”³⁰ The table below summarizes data from patient reports to the committee.³¹

- The American Academy of Allergy, Asthma and Immunology (AAAAI), which is the nation’s largest professional organization of allergists, published a position statement based on an extensive literature review and comments by its members. The statement said:

The idea that the environment is responsible for a multitude of human health problems is most appealing. However, to present such ideas as facts, conclusions or even likely mechanisms without adequate support is poor medical practice. . . .

There are no immunologic data to support the dogma of the clinical ecologists. . . . The suggestion that neutralization therapy can provide rapid relief within minutes or hours cannot be supported by controlled clinical studies or immunologic data. . . .

Advocates of this dogma should provide adequate studies . . . which meet the usually accepted standards for scientific investigation.³²

In 1997, the AAAAI’s board of directors reviewed the evidence again and concluded that “a causal connection between environmental chemicals, foods, and/or drugs and the patient’s symptoms is speculative and not based on the results of published scientific studies.”³³

- The American College of Physicians (ACP) has issued a position paper concluding that “there is no body of evidence that clinical ecology treatment measures are effective.”¹¹ An accompanying editorial in the same journal notes that its promotion has many characteristics of a cult and that

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its treatment approach should not be considered harmless.³⁴

- The Canadian Psychiatric Association’s position statement on environmental hypersensitivity acknowledges that patients diagnosed as environmentally sensitive experience subjective discomfort and sometimes disability. The Association concluded, however, that “there is not sufficient evidence to state that environmental pollutants or food additives cause the complaints subsumed under the term ‘environmental hypersensitivity.’”³⁵

- The American Medical Association Council on Scientific Affairs has concluded:

Until . . . accurate, reproducible, and well-controlled studies are available . . . multiple chemical sensitivity should not be considered a recognized clinical syndrome. . . .

Based on reports in the peer-reviewed scientific literature . . . (1) there are no well-controlled studies establishing a clear mechanism or cause for [MCS]; and (2) there are no well-controlled studies providing confirmation of the efficacy of the diagnostic and therapeutic modalities relied on by those who practice clinical ecology.³⁶

- The Board of the International Society of Regulatory Toxicology and Pharmacology (ISRTP) has concluded:

Current scientific information reports no clinical, laboratory, or other objective support for the proposition that MCS represents a clinically definable disease entity. The theories claiming to unify this condition as a toxicologically mediated disorder transgress basic principles of toxicology and clinical sciences. These violations include the allegations that: (1) a toxic response to one chemical can lead to a “sensitivity” to all other chemicals; (2) “petrochemicals” and “man-made” chemicals somehow differ in their toxicological potentials from “natural” chemicals; (3) a chemical may induce widespread symptoms associated with all organ systems; and (4) the manifestations of toxic responses to chemicals may vary widely and completely from individual to individual. Because these claims are both unproven and inconsistent with the current state of scientific knowledge, the ISRTP adopts the position that “MCS and its disorders, known as ecological illness and environmental illness, cannot be considered an organically based toxicological disease process.”³⁷

A National Research Council (NRC) subcommittee has concluded that hypersensitivity has an immunologic basis, but “multiple chemical sensitivity (MCS) syndrome” does not.³⁸ (In other words, although some people are sensitive to small doses of one or a few specific chemicals, the

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idea that people become generally hypersensitive to chemicals has no scientific foundation.) The subcommittee also noted that the controversy surrounding the diagnosis of MCS cannot be resolved until MCS is clearly (and measurably) defined and then explored with well-designed studies. After a workshop at which proponents discussed possible research protocols, the NRC warned again that meaningful research on “multiple chemical sensitivity” cannot be conducted until clear criteria for such a diagnosis can be defined.³⁹ Despite this, “MCS” proponents tout NRC’s involvement as evidence that their beliefs and practices are legitimate.

A passage in the NRC’s 1992 report unfairly criticized allergist Abba I. Terr, M.D., who had authored the American College of Physicians’ position paper on clinical ecology. Two MCS proponents used this passage to attempt to pressure the college to withdraw its 1989 position statement.⁴⁰ The ACP refused and protested to NRC, which issued an erratum with the criticism of Terr deleted.⁴¹

In 1996, an NRC committee concluded that there is no convincing evidence that electromagnetic fields (EMFs) have any adverse effects on health. Among other things, the report noted no evidence to show that EMFs can alter the function of cells at levels of exposure common in residential settings.⁴²

Case Studies

Many experts have studied “MCS” patients and concluded that their basic problem is psychologic rather than physical.⁴³ The best current data suggest that certain psychologic factors predispose individuals to develop symptoms and to seek out someone who will provide a “physical” explanation of their symptoms.^{44,45} Many of these patients suffer from somatization disorder, an emotional problem characterized by persistent symptoms that cannot be fully explained by any known medical condition, yet are severe enough to require medical treatment or cause alterations in lifestyle.⁴⁶ Some are paranoids who are prone to believe that their problems have outside causes.⁴⁷ Others suffer from depression, panic disorder,⁴⁸ agoraphobia, hyperventilation syndrome,⁴⁹ or other anxiety states that induce bodily reactions to stress. Many patients are relieved when a clinical ecologist offers what they think they need and encourages them to participate actively in their care. However, the treatment they receive may do them far more harm than good.

• Carroll M. Brodsky, M.D., Ph.D., professor of psychiatry at the

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University of California (San Francisco) School of Medicine, described the recruitment process in a report on eight people who, following diagnosis by a clinical ecologist, had filed claims for injury primarily by airborne substances. He concluded that they were "adherents of physicians who believed that symptoms attributed by orthodox physicians to psychiatric causes are in fact due to common substances in air, food, and water." He also stated that clinical ecologists

neither promise nor give hope of eliminating the offending condition, and the patients do not seem to expect it. . . . [They] seem content with their condition and with the reassurance that their symptoms have a physical cause. . . . Yet we must also recognize that these patients have had symptoms for many years, and whether seen as neurasthenic, hypochondriacal, or phobic, they are among the most resistant and difficult to treat. . . . These patients search for healers who will provide them with an explanation of their experiences and symptoms that makes sense to them and fulfills a number of psychological needs.⁵⁰

The fact that some clinical ecologists believe that they themselves have MCS has been described as "a powerful bonding tool which snares patients into a . . . cult interdependence in which facts are irrelevant."⁵¹

• In 1986, Abba I. Terr, M.D., an allergist affiliated with Stanford University Medical Center, reported on 50 patients who had been treated by clinical ecologists for an average of two years. Most of these patients had made a workers' compensation claim for industrial illness. Although all had been diagnosed as "environmentally ill," Dr. Terr could find no unifying pattern of symptoms, physical findings, or laboratory abnormalities. Eight of the patients had not developed symptoms until after they had consulted a clinical ecologist because they had been worried about exposure to a chemical. Eleven had had symptoms caused by preexisting problems unrelated to environmental factors, and 31 had multiple symptoms. Their treatments included dietary changes (74% of the patients), food or chemical extracts (62%), an antifungal drug (24%), and oxygen given with a portable apparatus (14%). Fourteen of the patients had been advised to relocate to a rural area, and a few were given vitamin and mineral supplements, gamma globulin, interferon, female hormones, and/or oral urine. Despite treatment, 26 patients reported no lessening of symptoms, 22 felt worse, and only 2 had improved.⁵²

In 1989, Terr⁵³ reported similar observations on 90 patients, including 40 who had been covered in the previous report. Although one or more of over 50 sources of chemicals at their workplace had been blamed for the

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patient’s problem, Terr noted that the testing process did not usually include extracts of the workplace materials that were presumed responsible. He also noted that 32 of the 90 patients had been diagnosed as suffering from “Candidiasis hypersensitivity,” a diagnosis that the American Academy of Allergy, Asthma and Immunology considers “speculative and unproven.”⁵⁴ Since provocation-neutralization tests had played a major role in the misdiagnosis of most of the patients he examined, Terr pointed out that scientific studies have shown it is unreliable. He believes that although exposure to chemicals can cause disease, it is unlikely that the diagnostic and treatment methods of clinical ecology are effective. He also believes that its methods and theories appear to cause unnecessary fears and lifestyle restrictions.

- In 1989, a reporter from the syndicated television program “Inside Edition” visited Rea’s clinic as a patient. The reporter truthfully told Rea that he had been feeling more tired than usual, that he was having headaches that could be relieved by aspirin, that his eyes had been getting red more often than usual, and that his shoulder still hurt from an accident several months ago. Rea said that all the symptoms could be due to allergies and ordered a lengthy series of skin tests.

Before visiting Rea, the reporter had been checked by Raymond G. Slavin, M.D., past president of the American Academy of Allergy, Asthma and Immunology, who had found no evidence of allergy. After the reporter returned from his visit to Rea, Slavin said that Rea’s testing was a waste of money because the reporter’s story did not provide a legitimate basis to suspect that his symptoms were due to allergies. Slavin also said that the skin reactions produced by the testing were caused by irritation from the injected chemicals rather than by allergies. “Inside Edition” reported that treatment at Rea’s facility cost thousands of dollars and that he referred many of his patients to a trailer court near Dallas where “environmentally safe” cottages and trailers could be rented for \$500 per week. Rea also has operated an inpatient unit at a hospital in Dallas. Rea’s patient manual—about 75 pages long—contains detailed instructions about choosing foods and avoiding environmental chemicals.⁵⁵

- A research team from the State of Washington conducted immunologic and psychologic tests of 41 MCS patients and 34 patients with chronic musculoskeletal problems. The immunologic tests revealed no significant differences between the two groups. The MCS patients tended to have higher levels of psychologic distress and a greater tendency to report “medically unexplained” physical symptoms.⁵⁶

- Philip Witorsch, M.D., and colleagues from the Georgetown Univer-

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sity Medical Center evaluated 61 MCS cases, examining 41 of them directly and reviewing the records of the rest. In no case were there any objective physical or laboratory findings that correlated with the subjective complaints. Among the 41 who were seen, all fit established criteria for at least one psychiatric diagnosis.⁵⁷

- MCS patients commonly report difficulty concentrating, remembering, or thinking clearly. However, researchers at the Robert Wood Johnson Medical School performed standardized neuropsychological tests and found no significant differences in cognitive function among 36 MCS patients, 18 chronic fatigue patients, and 18 apparently healthy control subjects.⁵⁸

- Donna E. Stewart, M.D., associate professor of psychiatry and of obstetrics and gynecology at the University of Toronto assessed 18 “20th Century disease” patients referred to the university’s psychiatric consultation service and concluded:

Virtually all had a long history of visits to physicians, and their symptoms were characteristic of several well known psychiatric disorders. . . . It is important that patients with a wide range of diagnosable and treatable psychiatric conditions not receive a misdiagnosis of 20th-century disease and thereby embark on a prolonged, socially isolating, expensive and often harmful course of ecologic treatment that reinforces their invalidism.⁵⁹

- Ronald E. Gots, M.D., Ph.D., has reviewed the medical records of more than a hundred MCS patients and concluded:

Unlike many “alternative medical practices,” the diagnosis of MCS begins a downward spiral of fruitless treatments, culminating in the withdrawal from society and condemning the sufferer to a life of misery and disability. This is a phenomenon in which the diagnosis is far more disabling than the symptoms.⁶⁰

- Psychiatrist Donald W. Black, M.D., and colleagues at the University of Iowa College of Medicine reported that the prevalence of major psychiatric disorders among 26 “environmental illness” (EI) patients was more than twice as high as that of a control group. The researchers concluded that patients receiving this diagnosis may have one or more commonly recognized psychiatric disorders that could explain some or all of their symptoms.⁶¹

These researchers later described how the misdiagnosis involved can produce psychosocial, financial, occupational, and psychological complications. The psychosocial complications usually stem from recommenda-

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tions to avoid contact with offending agents. As a result, patients become socially constricted or reclusive. The financial cost can be enormous; for example, a patient may be instructed to add a “safe” room to his house, or even to rebuild the entire house. Relocating can be very expensive, particularly if it involves quitting one’s job or moving long distances to seek a pollutant-free environment. Occupational complications can arise when a person is advised to quit a job or stop working, due to presumed exposure on the job. The researchers concluded:

Perhaps the major disadvantage to receiving a diagnosis of EI is that it deprives the subject of an appropriate medical or psychiatric diagnosis and access to proven therapies. For example, a person with depression could receive appropriate [medication]. . . . Furthermore, the diagnosis of EI can be psychologically damaging because it reinforces illness behavior and promotes the idea that a patient is an immunologic cripple; this erroneous belief is then reinforced and validated by the support network that has developed around EI.⁶²

Black has also described the cases of four patients with hypochondriacal beliefs that they were chemically hypersensitive. All had been instructed not to work (or to change their line of work) and to avoid social activities. Black concluded: “In addition to misattributing symptoms to a diagnosis of questionable validity, the clinical ecologists involved with these patients failed to recognize treatable psychiatric disorders.”⁶³

- A committee sponsored by the government of Nova Scotia examined the medical records of 86 patients said to be “environmentally hypersensitive.” In every case, the panel was able to make a standard medical or psychological diagnosis. The committee concluded there was no evidence to confirm the existence of “environmental illness.”⁶⁴

- By 1985, Drs. Selner and Staudenmayer had tested more than a hundred patients in their environmental unit. In a lengthy report, they concluded: (1) people do exist who are very sensitive to various microorganisms, noxious chemicals, and common foods; (2) the key question is whether multisystem disease can be caused by generalized allergy to environmental substances; (3) when a physician is confronted by a patient claiming to be “allergic to everything,” the diagnosis can usually be traced to the influence of a proponent of clinical ecology; (4) there is no scientific evidence that an immunologic basis exists for such a symptom pattern; (5) clinical ecologists assume that if even a trace of any chemical is found in the patient’s environment, that chemical can be held responsible for any symptom; (6) clinical ecologists appear to lack the motivation or intellec-

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tual capacity to test their theories scientifically; (7) clinical ecologists offer a philosophy of certainty, often reassuring patients during an initial phone contact that their diagnosis is obviously ecologic disease; (8) patients with genuine allergies to noxious chemicals do not have multisystem complaints without associated physical or laboratory findings; (9) many patients with symptoms of “environmental illness” find “healers” who tell them they are “universal reactors” to environmental substances; (10) this explanation of their experience and symptoms makes sense to them and enables them to avoid facing their real problem—which is psychological; (11) most people said to be “universal reactors” develop multiple symptoms in response to the testing process without being allergic to any of the individual substances administered; and (12) once patients understand that this can happen, psychotherapy may cure them.⁵¹

One of Selner and Staudenmayer’s successful patients was a 45-year-old woman who had been troubled by headaches, generalized pain, disturbed mood, confusion and abdominal discomfort. After a four-day standardization period in which her environment was controlled without dietary alteration, she experienced remarkable relief from all of her symptoms except the abdominal discomfort. She was placed in a challenge booth and, under blinded conditions, exposed to a sham challenge of clean air. Her symptoms recurred immediately and lasted several hours. After two days of fasting (with spring water), she had no symptoms. She then was challenged with a tiny amount of Fuller’s earth (an inert substance) in four gelatin capsules. She had an immediate reaction that left her with a severe gastrointestinal upset, vertigo (dizziness), severe weakness, and mental confusion that lasted for more than 48 hours. A diagnosis of somatization was made, and the situation was explained to her. Accepting this explanation, she entered an outpatient psychotherapy program, lost nearly all of her symptoms, achieved employment success, and resolved many things that had been troubling her emotionally.⁵¹

A court case illustrates what can happen when the patient’s true problem goes untreated. In 1991, a jury in New York City awarded \$489,000 in actual damages and \$411,000 in punitive damages to the estate of a man who committed suicide at age 29 after several years of treatment by a clinical ecologist. Testimony at the trial indicated that the patient was a paranoid schizophrenic who thought “foods were out to get him.” This type of mental problem may respond well to antipsychotic medication. However, the testimony indicates that the doctor had diagnosed the man as a “universal reactor” and advised that, to remain alive, he must live in a “pure” environment, follow a restrictive diet, and take dietary supplements.⁶⁵

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Another serious problem is the disruption that occurs when family members disagree about the value of “ecological” treatment. In one case I know, a teenage girl troubled by fatigue was diagnosed as sensitive to foods, chemicals, and electromagnetic fields by clinical ecologists whose tests, treatments, and recommended household modifications cost \$100,000 during a one-year period. Although the girl’s condition worsened, she and her mother had complete faith in the treatment and wanted to continue it. The girl’s father, who concluded that the treatment was futile, was forced to choose between continuing to pay for it or antagonizing his wife and daughter, whom he deeply loved. With great reluctance, he filed for divorce in order to protect himself against financial ruin.

MCS-Related Activities

Rejection by the scientific community has not dampened the enthusiasm of clinical ecologists who have fostered their own professional groups, health centers, and advocacy organizations for the express purpose of promoting their views.

About 400 clinical ecologists belong to the American Academy of Environmental Medicine (AAEM).⁶⁶ This organization, founded by Theron Randolph, M.D., in 1965 as the Society for Clinical Ecology, is composed mainly of medical and osteopathic physicians. AAEM’s journal was published in the 1980s as *Clinical Ecology* and renamed *Environmental Medicine* in 1991. During the late 1980s, the editor complained that he was not receiving enough acceptable manuscripts to maintain a quarterly schedule. The publication frequency subsequently decreased.

Clinical ecologists also play a role in the American Academy of Otolaryngic Allergy (AAOA), which was founded in 1941 by Randolph and others who espoused diagnostic and treatment procedures that mainstream allergists regarded as invalid. AAOA has about 2,000 members, most of whom are board-certified otolaryngologists.⁶⁷ The percentage of members who agree with the practices of clinical ecology is unknown, but some AAOA seminars are taught by leading clinical ecologists. AAOA has endorsed the use of provocation and neutralization testing.⁶⁸

In 1975, Dr. William Rea founded the American Environmental Health Foundation in Dallas, Texas. Its 1995 catalog states that the foundation had “funded over 30 major medical research projects and provided environmentally safe products to patients and to the public-at-large.”

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Several voluntary organizations have developed around the concepts of clinical ecology and MCS and advocate litigation as a way to gain recognition for these concepts. The Human Ecology Action League (HEAL), founded in 1977, is composed mostly of laypersons and has chapters and support groups in about a hundred cities. It distributes physician and supplier referral lists, maintains a Web site, and publishes *The Human Ecologist*, a quarterly magazine of news and advice for patients and their families. HEAL instructs members how to press insurance companies to pay for their medical care, which usually costs thousands of dollars.

The National Center for Environmental Health Strategies (NCEHS), of Voorhees, New Jersey, is a membership organization that was started in 1986 and attracted more than 2,000 members. Its founder and president, Mary Lamielle, says that she started the group after an exposure to toxic chemicals, when she "found that no public agency or private organization could answer my questions or advocate for me."

The Chemical Injury Information Network (CIIN), of White Sulphur Springs, Montana, was founded in 1990 and has over 5,000 members. It publishes *Our Toxic Times*, a monthly newsletter for people "suffering from chemically related health problems." A CIIN brochure lists 150 items in its "MCS symptom checklist," but notes: "Unfortunately this is not a complete list."⁶⁹ In 1996, the newsletter announced that MCS advocates had joined forces with environmental activists to form the Chemical Injury Council, whose primary purpose is litigation. Its initial aims include:

examination of the unethical practices of independent medical examiners, decertification of self-insured employers that consistently injure their workers, multiple plaintiff actions against employers that chemically injure their employees, and multiple plaintiff actions against state agencies that consistently engage in unfair and inconsistent determinations of claimants' cases.⁷⁰

CIIN's research arm, called the Environmental Access Research Network (EARN), publishes *Medical & Legal Briefs*, a bimonthly newsletter. EARN also provides telephone consultations and maintains referral lists of attorneys and expert witnesses.

The Chemical Injury Litigation Project, coordinated by MCS activist Julia Kendall, helped MCS patients find physicians and lawyers. According to press reports, she and about two dozen others wore respirators and shouted "perfume stinks" during a demonstration outside the hotel housing the 1994 annual convention of the Cosmetic, Toiletry and Fragrance Association.⁷¹ According to one report, Kendall said, "Basically . . . we

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want to destroy the [fragrance] industry."⁷² She died in July 1997.

Finally, MCS Referral & Resources, of Baltimore, Maryland, publishes reports, makes referrals, operates a clearinghouse, and engages in "public advocacy devoted to the diagnosis, treatment, accommodation and prevention of multiple chemical sensitivity disorders." Its medical director Grace Ziem, M.D., Dr.P.H., has served as an expert witness in legal cases.

"MCS" in Court

Many people who believe that chemical exposure has harmed their health have taken legal action consistent with this belief. One early case involved clinical ecology's founder, Theron Randolph, M.D., and his wife, Janet. In 1977, a federal tax court ruled that their extra expense for "organically grown" foods was tax-deductible as a medical expense. The Randolphs claimed that Janet experienced mental confusion, crossed eyes, and difficulty in walking when she inhaled or ingested contaminants, and that Theron had suffered from loginess (sluggishness), malaise, headaches, nausea, and anorexia due to contaminated foods. Since then, claimants have had varying success with their lawsuits.

One area of great concern to MCS proponents is whether insurance companies will pay for their treatment, which can be quite expensive. Most insurance policies do not cover unsubstantiated treatment. This is why MCS advocacy groups advise suing if a company refuses to pay. Such suits can be expensive to defend and may trigger an award for punitive damages if a jury concludes that an insurance company has acted in "bad faith" in refusing to pay for clinical ecology treatment.

Claims and lawsuits are also being filed to collect workers' compensation and Social Security Disability. Although awards are limited and individual claims may not be expensive to defend, some cases involve many workers who claim they were made ill by low-dose exposure to chemicals in the workplace. Some courts have recognized MCS as a compensable occupational disease or a disability. Even when the court does not recognize MCS as a disease, it may award benefits to a plaintiff considered disabled by a somatization disorder or other psychological impairment.⁷³ Many MCS advocates disapprove of basing benefits on such psychological diagnoses.

Many lawsuits have been based on allegations that chemical exposures cause disease by injuring the immune system. This notion is supported

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by a network of clinical ecologists and others who misinterpret laboratory data to support claims that virtually any symptom can be caused by exposure to almost anything. They testify that the immune system can become overactive (leading to numerous symptoms) or suppressed (leaving the individual at risk for infection, cancer, rheumatoid arthritis, and other diseases). The latter mechanism has been referred to as “chemical AIDS.” Some cases involve people who are not physically ill but are *afraid* that low-dose exposure to environmental chemicals has affected their immune system and may make them susceptible to cancer or other diseases in the future.⁷⁴ Suits have even been brought alleging emotional distress over an allegedly toxic exposure.⁷⁵

Legitimate cases exist where exposure to large or cumulative amounts of toxic chemicals has injured people. But in many of the cases described above, serious immune disorders are being alleged merely because laboratory testing has detected traces of a chemical in the body or has found a minor deviation from “normal” in some measure of immune function. Although no clinical injury is apparent, these plaintiffs are often said to have “chemical AIDS.” Where many plaintiffs are involved, it would be prohibitively expensive for a defendant to examine all of them to obtain evidence to rebut the claims. Such “toxic tort” suits also carry a threat of punitive damages if the defendant loses. These factors may intimidate defendants into settling.⁷⁶

For example, In 1987, a Texas attorney began filing suit on behalf of 3,328 people who had worked at the Lone Star Steel Plant. The suit claimed the plant had infected them with “chemical AIDS,” caused by a “toxic mushroom cloud” that “hovered ominously” for 40 years over the company’s property. The suit named 538 defendants, including companies that had supplied products used at the plant. *Forbes* magazine reported that when attorneys for the defense had attempted to find out about plaintiffs’ alleged injuries, they were told that the information was not yet available—and their defense was stymied by a state court judge sympathetic to the plaintiffs. In 1995 the Texas Supreme Court ordered the plaintiffs to provide the requested information about the nature and the cause of their alleged illnesses, and a motion is now pending to dismiss 1,800 plaintiffs who have not answered basic discovery questions. The *Forbes* report states that during eight years of legal battling in which the defendants were not even supplied basic information about the plaintiffs’ alleged injuries, about 200 of the defendants and their insurance companies decided that settlement would be cheaper than legal fees. In effect, these companies paid a total of

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\$70 million “over unproved charges for a nonexistent illness.”⁷⁷

Fortunately, a 1993 U.S. Supreme Court decision has strengthened the ability of judges to exclude unscientific testimony, such as the testimony typically supplied in MCS lawsuits. Rule 702 of the Federal Rules of Evidence states that expert testimony is admissible if it is relevant and the witness is qualified by knowledge, skill, experience, training, or education. In *Daubert v. Merrell Dow*, the court expanded this rule and stated:

In order to qualify as “scientific knowledge,” an inference or assertion must be derived by the scientific method. . . .

Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset . . . whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether the reasoning or methodology properly can be applied to the facts in issue. . . .

Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested. . . .

Another pertinent consideration is whether the theory or technique has been subjected to peer review and publication. . . . Submission to the scrutiny of the scientific community is a component of “good science,” in part because it increases the likelihood that substantive flaws in methodology will be detected. . . .

Widespread acceptance can be an important factor in ruling particular evidence admissible, and a known technique that has been able to attract only minimal support within the community may properly be viewed with skepticism.⁷⁸

Timothy Kapshandy, an attorney who specializes in litigation involving scientific evidence, has noted:

Before the Supreme Court’s 1993 decision in *Daubert v. Merrell Dow*, the validity of scientific evidence in all federal and most state courts was evaluated under a “general acceptance” standard. This generally meant that when controversial science was at issue, the proponent’s expert would state that the methodology was “generally accepted,” the opponent’s expert would disagree, and the judge would let the jury decide. *Daubert* requires federal judges, not the jury, to evaluate the validity of the methodology and its applicability to the case. A number of state courts have adopted the *Daubert*

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guidelines.⁷⁹

Appendix 1 summarizes 29 rulings adverse to clinical ecology theories and methodology. Although it is difficult to “keep score,” Kapshandy believes that exclusion of dubious MCS-related testimony has increased. A state court judge recently stated that under *Daubert*, courts that have addressed the admissibility of the MCS diagnosis have generally rejected it.⁸⁰

Some MCS proponents hope that shifting their terminology will prevent the courts from relying on previous rulings that MCS is not a valid diagnosis. As three attorneys recently noted:

Because MCS is controversial, many practitioners are now avoiding the more colorful names, and often refer to MCS as “not as a condition *per se*, but as a symptom complex resulting from a primary diagnosis, such as organic brain dysfunction or toxic encephalopathy.”⁸¹

In one case, an appeals court reinstated the testimony of an MCS proponent who had carefully avoided calling the plaintiff’s condition MCS.⁸²

Conclusion

“Multiple chemical sensitivity” is not a legitimate diagnosis. It is a phenomenon in which people misinterpret irritant or stress responses as “allergies” or “toxicities” and alter their behavior abnormally. Instead of testing their claims with well-designed research, its advocates are promoting them through publications, talk shows, support groups, lawsuits, and political maneuvering. Many are also part of a network of questionable legal actions alleging injuries by environmental chemicals.

Many people diagnosed with “MCS” suffer greatly and are very difficult to treat. Well-designed investigations suggest that most of them have a psychosomatic disorder in which they react to stress by developing multiple symptoms. Many of these patients are financially exploited and are discouraged from seeking proper medical and psychiatric care. In addition, insurance companies, employers, educational facilities, homeowners, other taxpayers, and ultimately all citizens are being burdened by dubious claims for disability and damages. To protect the public, state licensing boards should scrutinize the activities of clinical ecologists and decide whether the overall quality of their care is sufficient for them to remain in medical practice. I believe that most of them should be delicensed.

Recommendations

The problems described in this report will not be simple to correct, but the following measures may help.

To physicians

- The terms MCS, EI, and the like should be abandoned and replaced by a diagnostic term that does not imply an unsubstantiated cause.
- Remember that patients with multiple symptoms are suffering. Try to explain how stress often leads to symptoms, and to persuade them to seek mental help.

To psychiatrists, psychologists, and other mental health workers

- Do not reinforce unsubstantiated beliefs about MCS.
- Aim to establish trust and rapport. Then help patients manage their symptoms, cope with their limitations, and restructure their beliefs about their health.

To clinical ecologists

- Set up genuine protocols so that your data can be tabulated and put in publishable form.
- Abandon provocation-neutralization and other questionable tests unless their value is repeatedly demonstrated by well designed double-blind studies.
- Abandon the other trappings of quackery, such as useless dietary supplements, homeopathic products, and sauna “detoxification” or “purification.”

To scientific medical organizations

- Issue updated position papers on MCS and its associated trappings.
- Declare it unethical to administer diagnostic and treatment procedures that are unsubstantiated and lack a scientifically plausible rationale.
- Stop legitimizing quack “alternative” practices by awarding category I credits for conferences.
- Press the American Academy of Otolaryngologic Allergy to revoke its endorsement of unsubstantiated tests and procedures.

To manufacturers

- Industries at risk, including insurance companies, food and chemical manufacturers, the cosmetics industry, and employers, should provide independently administered funds to help solve MCS-related problems.

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- Some of the money should be used for research. Priority should be given to double-blind placebo-controlled studies to determine whether patients’ symptoms are actually caused by chemical sensitivity. At present, few facilities in the United States can perform such testing.
- Other money should be used to maintain a clearinghouse for information on the scientific, legal, and political issues. The information should include scientific reports, legal case reports, and prior testimony by potential expert witnesses.

To legislators

- Don’t permit “alternative” practitioners to practice under standards lower than those by which science-based practitioners are judged.
- Don’t legislate money for MCS-related research that has no practical value.
- Don’t permit MCS claimants to be compensated under the Americans with Disability Act for other than psychiatric reasons.
- Don’t enact laws that enable “MCS” patients to infringe on the rights of others.

To the National Institute of Environmental Health Sciences

- Stop distributing literature which suggests that MCS is a clearly defined disease entity caused by exposure to environmental chemicals.

To patients and their families

- Remember that MCS is a label, not a disease. The symptoms associated with the “MCS” diagnosis are likely to be bodily reactions to stress. Don’t seek treatment with a clinical ecologist. Go instead to a mental health practitioner who can explore how the symptoms arise and what can be done to overcome them.
- If a family member falls under the spell of a clinical ecologist, act quickly to protect yourself. Don’t permit your love to lead you to financial ruin.

To educators

- Do not agree to provide “safe rooms,” home tutoring, or other special accommodations for children with “MCS,” because these accommodations send false messages to children about their health status.

To state licensing boards

- Investigate the activities of clinical ecologists to determine whether the overall quality of their care is sufficient for them to remain in medical practice.

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To judges

- Use the Daubert case to exclude unhelpful testimony.

To insurance companies

- Check your policies to be sure that nonstandard diagnostic and treatment methods used by clinical ecologists are excluded. Be alert to the possibility that some patients may be improperly reported as having porphyria or a yeast infection.

To the news media

- Don't glorify MCS patients. Articles that could stimulate readers to consult clinical ecologists have great potential for harm. Public information should be based on established facts and not on speculation.

To researchers

- Set up inpatient/outpatient treatment units that offer treatment under scientifically sound protocols.
- Limit other research to hypotheses that are plausible, testable, and likely to produce information that is medically useful or can help courts and regulatory agencies make equitable decisions.

Appendix A

Court Rulings Unfavorable to MCS

Bahura et al. v. S.E.W. Investors et al. The trial court judge overturned four out of five jury verdicts favoring plaintiffs in a “sick building syndrome” action brought by Environmental Protection Agency workers at the Waterside Mall Office Complex. Plaintiffs claimed to have MCS toxic encephalopathy caused by building renovations. Dr. Iris Bell’s testimony on the “limbic kindling” hypothesis was excluded as unreliable. [This theory is described in the Glossary.] The judge noted that she had acknowledged that this was not generally accepted in the fields of psychiatry or neurology, and that low-level exposure to everyday chemicals does not cause permanent injury. [No. 90-CA-10594, District of Columbia Superior Court, Nov. 29, 1995]

Benney v. Shaw Industries, Inc. The court excluded the opinion of Dr. Hildegard Staninger that plaintiff’s MCS was caused by carpeting and a “bug bomb” as his methodology was unreliable. The court also excluded as unreliable the testing of Dr. Alan Broughton’s laboratory as not the type reasonably relied upon by experts in the field. [No. 93-685-CIT-T-21(A), Middle District, Florida, 1995]

Bloomquist v. Wappello County et al. The judge overturned a \$1,000,000 verdict for two employees of a “sick building,” ruling that plaintiffs’ clinical ecology evidence was “unproven medical speculation which is not accepted by mainstream medicine.” [Mahaska City, Iowa, Dist. Ct. No. CL0174-0687 [Aug. 28, 1990] The Iowa Supreme Court later reversed the judge’s ruling, holding that epidemiologic evidence was not required. [No. 419/90-1371, Iowa Sup. Ct., April 21, 1993]

Bradley v. Brown. Two federal courts excluded testimony of Drs. William Rea and Alfred Johnson. The trial court found their methodology anecdotal and speculative. Regarding the general concept of MCS, the court held that scientific knowledge about its etiology has not progressed from hypothesis to knowledge capable of assisting the jury. [No. CIV-H85-958, 1994 WL 199827, Northern District, Indiana, May 17, 1994, affirmed, No. 94-2467, 7th Circuit, Dec. 13, 1994]

Brandon v. First Republicbank Group Medical Plan. A federal judge ruled that the services of clinical ecologists Drs. William Rea and Alfred Johnson were not medically necessary and therefore not coverable under an employee welfare benefit plan. [No. CA-7-89-002, Northern District, Texas, Nov. 27, 1990]

These summaries were prepared with help from Timothy E. Kapshandy, J.D., a partner in the law firm of Sidley & Austin (Chicago office). Mr. Kapshandy specializes in litigation involving scientific evidence, including the defense of claims from exposure to low levels of chemicals and other substances.

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Brown v. Shalala. An administrative law judge ruled that the plaintiff was not entitled to Social Security disability benefits because her diagnosis of environmental illness, using techniques such as sublingual testing, was not based on medically acceptable clinical and laboratory techniques. The ruling was upheld on appeal by both the federal court and the federal court of appeals. [15 F.3d 97, 8th Circuit, 1994]

Carlin v. RFE Industries et al. The judge excluded the testimony of Drs. James Miller and Michael B. Lax that plaintiff had MCS from exposure to solvents used in the manufacture of circuit boards. The court held that the diagnosis was not based on reliable methods and that the general validity and etiology of MCS had not been established. [No. 88-CV-842, Northern District, New York, Nov. 27, 1995]

Carroll v. Litton Systems. A federal judge excluded the lymphocyte testing and autoantibody testing of Dr. Alan Broughton as lacking a proper factual basis (i.e., no proper controls; alternative causes not excluded). [No. B-C-88-253, Western District, North Carolina, Oct. 29, 1990] The judge’s ruling was reversed on other grounds. [No. 92-2219, 4th Circuit, Jan. 13, 1995]

Carroll v. Marion County Board of Education. A state jury sided with the defense in one of several cases brought by families who sued for students’ alleged long-term exposure to pesticides. The judge precluded clinical ecologist Grace Ziem, M.D., from testifying that the plaintiff’s son suffered from MCS. The judge said: (1) MCS did not pass the “good science” test, (2) the diagnosis of MCS had been almost universally rejected by the medical and scientific community, and (3) the methodology supporting MCS was “somewhat suspect.” [No. 92-C-196, W. Va. Circuit, Marion Co., Div 1]

Cavallo v. Star Enterprise et al. Plaintiff claimed that she had chronic respiratory illnesses through exposure to aviation jet fuel (AvJet) while walking across a parking lot of a restaurant about 500 feet way from a distribution facility where a 34,000-gallon spill had taken place. The court concluded that the opinion of plaintiff’s expert Dr. Joseph Bellanti were largely based on hypothesis and speculation. In granting summary judgment, the judge stated: “It may well be that AvJet spill forever ‘sensitized’ Ms. Cavallo to petroleum vapors and various household chemicals. But the published scientific literature and test results simply do not support that conclusion at any time.” [No. 94-1499-A, Eastern District, Virginia, 1995]

Claar et al. v. Burlington Northern Railroad. Six plaintiffs were selected from 27 cases of railroad workers filed under the Federal Employees Liability Act (FELA) suffering from unspecified multiple chemical exposures. The U.S. District Court of Montana provided summary judgment for the railroad because plaintiffs’ experts (Drs. Mark Hines and Richard Nelson) had failed to adequately explain the bases of their MCS diagnoses, specify which chemicals caused which injury, or rule out other possible causes. Plaintiffs argued that the court had erred in demanding that their experts demonstrate a causal connection between specific injuries and specific chemicals. The appellate court upheld the

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lower court, stating: “This argument misconceives both the standards for causation under FELA and its relationship to the Federal Rules of Evidence.” [No. 92-35337, 92-35539, U.S. District Court, Montana; 9th Circuit Court of Appeals, July 14, 1994]

Conradt v. Mt. Carmel School Fireman’s Fund Insurance Commission. The Wisconsin Court of Appeals upheld the Labor and Industry Review Commission’s denial of plaintiff’s claim (based on the opinion of Dr. Theron Randolph) that building materials at the school where she worked had caused her to develop MCS. The appeals court rejected claimant’s contention that her treating physicians should be accorded more credibility than employer’s experts. [No. 94-2842, Wisc. App. 2nd Dist., Sept. 27, 1995]

Frank v. New York. Plaintiffs alleged that exposure to pesticides and other chemicals had made them hypersensitive to normal levels of airborne chemicals and that their employer had failed to reasonably accommodate them as required under the Americans with Disabilities Act. The judge ruled that expert testimony about the cause of their alleged disability (MCS) would be too speculative to constitute “scientific knowledge.” He also noted that the theory underlying MCS was “untested, speculative, and far from generally accepted in the medical or toxicological community.” [No. 95-CV-399, U.S. District Court for the Northern District of New York, July 15, 1997]

Hundley v. Norfolk & Western Railway Co. The court excluded the opinions of Drs. Rea and Johnson that plaintiff’s one-time exposure to herbicides at a railyard was the cause of his MCS. [No. 91C -6127, N.D. Ill., Jan, 31, 1996]

Kuehm v. Hearnen Air Conditioning. Plaintiff brought a “sick building syndrome” case alleging mite and fungal allergies due to a defective ventilation system. The trial court summarily dismissed the case, holding that her experts’ speculation about conditions four years previous were not competent evidence. [No. A-4289-93T3, N.J. Super., App. Div., July 13, 1995]

La-Z-Boy Chair Co. v. Reed. The U.S. Court of Appeals for the Sixth Circuit affirmed the trial court’s decision to bar the testimony of plaintiff’s clinical ecologist, Fred Furr, M.D., that plaintiff was permanently disabled as a result of exposure to trichloromethane at work. The court held that such testimony was “only a theory which is not generally accepted by the medical profession.” [No. 90-6013, 6th Circuit, June 28, 1991]

Donald and Susan Maxwell v. Sears, Roebuck & Co. et al. Despite testimony by Alan Lieberman, M.D., Albert Robbins, D.O., and Susan Franks, Ph.D., the judge concluded that “multiple chemical sensitivity is a theoretical hypothesis lacking sufficient scientific proof.” Ruling that trial court must follow the “general acceptance” test set forth in *Frye v. United States*, the judge ordered all parties not to refer to MCS during the trial. [No. CA 94-0156, Fla. Circuit, Manatee Co., March 3, 1997]

Mullenax v. McRae’s. The Mississippi Workers’ Compensation Commission denied a claim that workplace exposure to solvents in art supplies had caused MCS. The Commission concluded that the unorthodox methodology of Dr.

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- William Rea did not establish causal connection, and that even if they were to accept the theory that exposure to one chemical can cause multiple chemical sensitivities, other legitimate explanations were not excluded. [No. 87-13915-D-3130, Mississippi Workers’ Compensation Commission, March 18, 1993]
- Nethery v. Servicemaster Co.*** The trial court excluded the testimony of Drs. Thomas Glasgow and Alan Lieberman, holding that MCS is an “unproven theory.” [No. 92-167(G)(L), Miss. Cir. Ct., Lee Co., Feb. 15, 1996]
- Newman v. Stringfellow.*** The trial court ruled that plaintiff’s immune assays, including calla and porphyrin antibody testing, performed by Dr. Bertram Carnow, were inadmissible because plaintiff failed to prove that the testing was “acceptable to at least a substantial minority of the relevant scientific community.” [No. 165994, California Superior Court, Riverside County, Jan. 17, 1991]
- In Re Paoli R. R. Yard PCB Litigation.*** The 3rd Circuit upheld the exclusion of the causation opinion of Dr. Janette Sherman for those plaintiffs on whom she did not perform the traditional clinical method (i.e., exam, history, etc.), but allowed it for those on whom she did. The court also excluded the immunological testing of Dr. Alan Broughton. [35F. 3rd 717, 3rd Circuit, 1994]
- Phillips v. Velsicol Chemical Corporation.*** Plaintiff, a percussionist with the Hong Kong Philharmonic Orchestra, alleged MCS symptoms had resulted from a single pesticide exposure in a concert hall. The court excluded screening tests performed by Dr. Robert K. Simon of Accu-Chem Laboratories because they were scientifically unreliable and not trustworthy and failed to follow established protocol. Dr. William Rea’s opinion regarding the harmful effects of chlordane on the plaintiff by “double-blind” tests were deemed irrelevant for lack of specifically identifying chlordane in the alleged incident in the concert hall. [No. 93-CV-140-J, District of Wyoming, Sept. 19, 1995]
- Rea v. Aetna Life Insurance Co.*** A federal judge rejected plaintiff’s attempt to bring a class action on behalf of clinical ecologists and their patients against Aetna and the American Academy of Allergy and Immunology, holding that plaintiffs failed to establish that clinical ecologists and their patients were a “recognizable and identifiable class.” [No. 3-84-0219-H, Northern District, Texas, Feb. 25, 1985]
- Rutigliano v. Valley Business Forms.*** The court excluded the opinion of Dr. Elaine Panitz that exposure to carbonless paper had made plaintiff sensitive to formaldehyde. The court noted that Panitz was basically a full-time witness who made her diagnosis after an initial visit, based on self-reported symptoms and history. The court also rejected her reliance on blood tests, done in Dr. Alan Broughton’s lab, which she had accepted if supportive but dismissed if negative. [No. 90-1432, D.N.J. June 27, 1996]
- Sanderson v. International Flavors and Fragrances et al.*** A federal judge summarily dismissed plaintiff’s claim that exposure to perfumes and colognes over an eighteen-month period has caused her to develop MCS, toxic encephalopathy, and impairment of her sense of smell. The court held that the testimony of Drs. Nachman Brautbar, Gunnar Heuser, Richard Perillo, and Jack Thrasher

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- were not sufficient to establish that her symptoms were caused by defendants’ fragrance products. The judge also ruled that the plaintiff had failed to demonstrate that MCS is “good science.” [No. CV-95-3387, C.D. Calif, Aug. 28, 1996]
- Schickele v. Rhodes.*** The court excluded the testimony of clinical ecologist Alan Levin, M.D., who was planning to testify that plaintiff suffered from chemically induced immune system dysfunction syndrome as a result to exposure to hydrogen sulfide. [No. C 451843, Arizona Superior Court, Maricopa County, Aug. 1, 1986]
- Sterling v. Velsicol Chemical Corp.*** The U.S. Court of Appeals for the 6th Circuit excluded from evidence the clinical ecology testimony of Dr. Alan Levin as generally unaccepted, based in part on the position papers of the American Academy of Allergy and Immunology and the California Medical Association, and reversed an award of damages for injuries to plaintiff’s immune system. [855 F. 2d 1188, 6th Circuit, 1988]
- Summers v. Missouri Pacific Railroad System.*** Railroad employees alleged they had developed chemical sensitivity and brain damage from short-term exposure to diesel exhaust fumes. The court excluded Dr. Alfred Johnson’s testimony on the basis that the MCS hypothesis was unproven. The court also found his efforts to distinguish plaintiff’s alleged “chemical sensitivity” from what was formerly called “multiple chemical sensitivity” unpersuasive. The testimony of psychologist Susan Franks, Ph.D., was also excluded. [No. 94-468-P, U.S. District Court, Eastern District, Oklahoma, Aug. 25, 1995]
- Taylor v. Airport Transport and Warehouse Services, Ltd.*** A British court rejected the claim of plaintiff’s clinical ecologist that her multiple chemical sensitivity was triggered by exposure to chemical fumes in a truck she was driving, holding that “her evidence was in many respects bizarre and unscientific . . . [and] unacceptable to the vast majority of doctors.” [No. 90/NJ/5076, High Court of Justice, Queen’s Bench Division, Oct. 24, 1991]
- Valentine v. Pioneer Chlor Alkali.*** Plaintiffs alleged that they suffered neuropsychological injuries from chlorine gas. The court excluded the testimony of Drs. Kaye Kilburn, Gunnar Heuser, and William Spindell as “novel” and “unsupported by research extraneous to the litigation.” Although a study by Kilburn had been published in a peer-reviewed journal, the court distinguished “editorial” peer review from “true peer review” and concluded that Kilburn’s study suffered from “very serious flaws.” [No. CV-S-92-0887-ECR, D. Nev. April 12, 1996]

Appendix B: Glossary

- agoraphobia:** Emotional disorder in which irrational fear of open or public places is so pervasive that the afflicted individual avoids or is reluctant to enter into a large number of situations. The term “toxic agoraphobia” has been suggested to characterize MCS patients who have become fearful about chemical exposure and have become socially withdrawn.
- allergy:** Abnormally high reactivity to specific antigens, brought about by immunologic mechanisms. Common allergic symptoms include rash, watery eyes, and wheezing.
- antibody:** Protein, produced by the body, that combines with a foreign material (antigen) to neutralize the foreign substance.
- antigen:** Substance that, when introduced into the body, stimulates production of an antibody. True allergies provoke a physically measurable response.
- blinding:** Experimental condition where a test takes place without the benefit of background information that might prejudice the outcome or result.
- “canaries”:** Term, sometimes used to characterize MCS patients, alluding to the practice of using canaries in coal mines to detect gas that was toxic but odorless. The death of a canary would indicate that a toxic level was present and that the workers should leave.
- candidiasis hypersensitivity:** Fad diagnosis based on the notion that multiple common symptoms are the result of sensitivity to the common yeast *Candida albicans*.
- challenge test:** Deliberate exposure to a substance to evaluate whether it produces an adverse reaction.
- chemical sensitivity:** Alternative term for multiple chemical sensitivity.
- clinical ecology:** Pseudoscience based on the belief that multiple symptoms are triggered by hypersensitivity to common foods and chemicals.
- complement:** A complex system of proteins found in normal blood serum that combines with antibodies to destroy potentially harmful bacteria and other foreign material.
- defendant (in a court case):** The party attacked by a legal action.
- desensitization:** Series of injections that make someone nonreactive or insensitive to an antigen. The amount used is tiny at first and is gradually increased. Also called immunotherapy.
- double-blind test:** Experiment in which neither the experimental subjects nor those responsible for the treatment or data collection know which subjects receive the treatment being tested and which receive something else (such as a placebo).
- encephalopathy:** General term for brain disease.

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environmental medicine: Term used to describe scientific approaches to environmentally related health problems. These approaches differ from the main tenets of clinical ecologists, who have co-opted the term to make themselves sound more respectable.

etiology: Cause or origin of a disease.

homeopathy: Pseudoscience based on the notion that a substance that produces symptoms in a healthy person can, if given in extremely small amounts, cure ill people with similar symptoms. Homeopathic practitioners theorize that the smaller the dose, the more powerful the effect—which is the opposite of what pharmacologists have demonstrated in dose-response studies. Homeopathic products are prepared by repeated dilution. Some are so dilute that no molecules of the original substance remain.

hypersensitivity: Abnormally high sensitivity.

hyperventilation syndrome: Condition in which anxiety produces overbreathing accompanied by lightheadedness, numbness and tingling of the hands and feet, and various other bodily reactions.

hypochondriasis: Morbid preoccupation with having a specific illness, not verified by medical investigation, that persists despite physician reassurance.

idiopathic: Of unknown cause.

idiopathic environmental intolerances (IEI): Term suggested for replacing MCS; an acquired disorder with multiple recurrent symptoms associated with diverse environmental factors tolerated by the majority of people and not explained by any known medical or psychiatric/psychologic disorder.

immunoglobulin: A type of antibody.

limbic kindling: Dubious theory that a portion of the brain (related to cognition, emotions, behavior, glandular function, and sense of smell) can become sensitized and cause symptoms after repeated exposure to low levels of chemicals.

megavitamin therapy: Questionable treatment using high dosages of vitamins, usually ten times or more times the Recommended Dietary Allowances (RDA) set by the National Research Council.

nasal: Pertaining to the nose.

neutralization: Dubious treatment procedure in which various amounts of an offending substance are given until a dose is found that provokes no symptoms.

objective sign (of illness): Indication of disease apparent to others besides the person affected.

panic disorder: A condition typified by sudden attacks of incapacitating anxiety. The symptoms can include rapid pulse; pounding heart; rapid, shallow breathing; and a sense of doom.

pathognomonic: Characteristic of a particular disease or condition.

phobia: Persistent irrational fear that impels the person to avoid the feared situation(s) or object(s).

placebo (in a clinical trial): Inert substance whose effect is compared to that of the method being tested.

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placebo effect: Favorable response that results from the act of treatment rather than the treatment itself.

plaintiff (in court case): The party that institutes a suit in a court.

porphyrias: Rare metabolic disorders, usually hereditary, characterized by the presence of large amounts of porphyrin in the blood and urine. Their most common symptoms are hypersensitivity to sunlight; abdominal pain; constipation and diarrhea; and neurologic disturbances.

provocation: Dubious clinical ecology procedure in which substances are administered by injection or sublingually to see whether the patient's usual symptoms occur.

psychogenic: Caused by emotional mechanisms.

safe house: Dwelling built and furnished with "nontoxic" materials.

sick building syndrome: Term used to describe nonspecific symptoms, for which no single cause can be identified, that arise where a problem of indoor air quality is suspected.

sign (of an illness): Objective indication of a health problem.

somatization disorder: Condition in which the body responds to stress by producing multiple symptoms similar to those of disease.

spreading: Dubious clinical ecology concept that sensitization to one chemical can cause hypersensitivity to unrelated chemicals.

sublingual: Under the tongue.

summary judgment: Court ruling that decides a case before it can go to trial.

symptom: Subjective indication of a health problem. (What the patient feels.)

syndrome: The group of signs and symptoms that characterize a disease, psychological disorder, or other abnormal condition.

total body load: Dubious clinical ecology concept based on the idea that biologic, chemical, psychological and physical "pollutants" can add to or multiply each other's effects and produce symptoms when the total exceeds what a person can tolerate. Also called "total load."

workers' compensation: Payment that must be made to an employee who is injured while working or becomes disabled in connection with work.

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