Dr. Root Lecture on MCS:

The following MCS lecture was given by Dr. David Root in the late 1980's, and is reprinted from his lecture script. It was presented to nurses and doctors at a hospital, but it serves to elucidate those who may be treating patients/clients with Multiple Chemical Sensitivity.

WORKERS WITH CHEMICAL SENSITIVITIES BY DAVID E. ROOT, M.D., M.P.H.

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This presentation will include information on the rationale for the diagnosis of Multiple Chemical Sensitivity Syndrome, a proposed definition of the problem, possible etiologies, diagnostic and therapeutic considerations for dealing with multiple chemical sensitivities, and a brief discussion of his experience when dealing with the syndrome.

Multiple Chemical Sensitivity Syndrome

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Multiple Chemical Sensitivity Syndrome

I. Introduction

In the October-December, 1987 issue of Occupational Medicine: State of the Art Reviews, Volume 2, Number 4, Mark Cull n, M.D., brought together a group of researchers, both clinical and research oriented physicians, who had a common interest in the worker with multiple chemical sensitivities. This was one of the first in-depth reviews of this problem presented in the U.S. literature, and was of interest because it attempted to bring to the reader at least a

somewhat balanced view of the problem; both sides of the question "Does this syndrome really exist?" were presented in the review. Several authors expressed the very strong viewpoint that the syndrome is nothing more than a psychological malady and has no relation whatsoever to chemical exposure, while others took the opposite view that this problem is caused by chemical exposure, and indeed this precept became one of the cornerstones in their definition. Since the appearance of that very excellent review, this problem has been widely discussed in occupational medical circles, and I am sure in other medical circles as well.

Drs. Nicholas Ashford and Claudia Miller have also produced an in-depth report to the New Jersey State Department of Health (December, 1989) on chemical sensitivity, which I highly recommend.

I will attempt to give you an overview of the syndrome of Multiple Chemical Sensitivities, and give you a little insight into the way I treat patients with this problem in my practice. Later you will hear from Dr. Megan Shields regarding her experience in treating patients with multiple chemical sensitivity.

I became interested in the Multiple Chemical Sensitivities Syndrome when I first encountered a patient with an extremely interesting and complex history, and indeed one of the most severely affected patients that I have seen with this syndrome. A 54 year old lady, who was a worker in a state office building, had her entire office moved to another building which was next door to a pesticide production plant. The building she was in was not sealed, and therefore, there was a large amount of very pungent fumes coming from the pesticide plant on a daily basis. She began noting an increasing uneasiness in her office setting, becoming very emotionally labile, that is, flying off the handle, becoming very upset emotionally, laughing and crying hysterically, and in general unable to continue with her job. She also noted increasingly severe problems with exposure to other scents, such as perfumes, aftershaves, and hairsprays. At the same time, cleaning solutions became very bothersome to her and an all-encompassing, overpowering fatigue came upon her, to the point that she could hardly get out of bed. She became increasingly sensitive to the environmental pollutants, such as cigarette smoke, car exhaust fumes, and even materials coming off of the walls and floors, such as paints and carpet fumes. She became so dysfunctional that she eventually moved to a town above the smog level in the mountains near Sacramento, and indeed had to stay in the unpainted barn for a period of approximately four months because she could not tolerate staying in the farm house which had painted walls. Eventually, she improved enough so that she could return to her home in the Sacramento valley, but had to camp out in a tent in her backyard since she could not really tolerate her own home. She was certainly not able to work in her prior setting. When I first saw her, she had been to many physicians who had tried many different treatments, usually involving drugs, and all of these seemed to make things worse for her. She had been labeled as

having psychiatric problems and tried on psychiatric medications, which certainly made her considerably worse. Her case demonstrates several points regarding the definition of Multiple Chemical Sensitivities Syndrome.

II. Definition of the Problem

In order to simplify and clarify discussion regarding Multiple Chemical Sensitivities (MCS) Syndrome, Cullen and his group chose to limit discussion as much as possible to a fairly narrow diagnostic grouping so that a meaningful discussion could be had regarding this syndrome. Several groups of chemical exposure syndromes were excluded:

those with sensitivities to isolated chemicals, such as isocyanates;

- those patients with some type of underlying disease who happened to be sensitive to rather broad classes of chemicals with similar toxic effects, such as those asthmatics sensitive to irritants like sulfur dioxide;
- those afflicted with the so called "tight building syndrome" (though some of these do develop Multiple Chemical Sensitivity Syndrome);
- those with a chemical headache related only · to one type of chemical, such as exposure to perfumes;
- those with the distorted perceptions of foul odors (cacosmia) on olfactory stimulation with a wide range of odorants (some of these are associated with neuropsychiatric diseases). Also excluded, were those who seemed to have unusual olfactory, or taste discriminating talents, and are employed precisely because of these talents, such as perfumers, tobacco blenders, chefs, and vintners.

Cullen and his group described seven major diagnostic features in Multiple

Chemical Sensitivity Syndrome.

1. The disorder is acquired in relation to some documentable environmental exposure(s), insult(s), or illness(es). This restricts attention to patients who develop symptoms for the first time after some untoward encounter with their environment, and specifically excludes patients with longstanding health problems who may later come to attribute certain symptoms to chemical exposure.

2. Symptoms involve more than one organ system. This limits attention to those patients with complex symptom patterns, and eliminates, as an example, patients with recurrent headaches, or cough, triggered by diverse stimuli.

3. Symptoms recur and abate in response to predictable stimuli. This criterion excludes patients whose symptom complex is constant, or has a pattern of variability largely unrelated to exposures.

4. Symptoms are elicited by exposures to chemicals of diverse structural classes and toxicologic modes of action. Individuals with classic allergic reactions to specific compounds and closely related substances, such as the previously mentioned isocyanates, are thus excluded.

5. Symptoms are elicited by exposures that are demonstrable, though of low level. This means that people other than the patient may be aware of the chemical, such as by smell, but may not be bothered by it. This criterion excludes frankly delusional patients, and those who speculate but cannot smell, or otherwise define, that chemicals "must be present" whenever they feel poorly.

6. Exposures that elicit symptoms must be very low, and by this, they meant many standard deviations below average exposures known to cause adverse human responses. They use, as a rule of thumb, that exposures are known to be generally lower than one percent of established threshold limit values (TLV), which are used for work exposures. However, data on the range of normal responses are often unavailable.

7. No single, widely available test of organ system function can explain symptoms. This excludes, as an example, individuals whose symptoms are attributable to bronchospasm, vasospasm, seizure disorder, or any other reversible lesion that can be identified and specifically treated.

The criteria listed above are not designed to be overly restrictive, and do describe a rather large patient population, but there are many patients meeting some, but not all, of these criteria, and Cullen describes several potentially relevant distinctions in other diagnostic groups. He differentiates MCS from the traditional "one toxin" acute occupational disease in which the exposed person may become very sensitive to exposure to that chemical at levels well below the listed threshold limit values. Some cases of occupational asthma fall into this category and may react with bronchospasm to extremely low levels of the offending agent. However, unless this patient becomes sensitive to multiple chemicals with multiple systems involved, he or she would not fit the diagnostic criteria for MCS.

Cullen also differentiates MCS from the class defined as "environmental illness" or "twentieth century disease." He would exclude from the MCS groupvpatients with unclear, or "masked," relationships between specific episodes of chemical exposures and subsequent symptoms. He notes that "we have drawn this, perhaps, arbitrary distinction because without it, the boundaries become far too ill-defined to allow intelligent discussion, let alone, meaningful clinical studies." A third area in which distinction must be drawn is from the psychiatric

population. He notes that, by definition, patients with MCS have recurring symptoms that are not readily explainable by available tests, and therefore most of these patients will meet some diagnostic criteria for Somatoform or psychosomatic illness. Some fulfill criteria for post-traumatic stress disorder or anxiety disorders. Although these diagnoses may be technically correct, he would reserve those designations for patients in whom the relationship between symptoms and environmental exposures is unclear, either because the symptoms long pre-date any awareness of environmental precipitins, or because symptom variation is largely independent of objective environmental stimuli.

III. Possible Etiologies

As Dr. Robert McLellan from the Center for Occupational and Environmental Medicine in Boston aptly pointed out in his review of MCS, "to date, literature concerning the etiology of MCS has been filled with more opinion, anecdote, and conjecture than data obtained as a result of well designed research." The theories of causation have been multiple and debated, sometimes rather hotly, in the medical, as well as lay, literature and include psychiatric, immunologic, psychophysiologic, nutritional, enzymatic, microbiologic, chronobiologic, and increased xenobiotic burden and olfactory (sense of smell). McLellan further notes that "if a unique syndrome (of a multiple chemical sensitivity) is ultimately defined, the etiology of MCS will likely be found to be multifactorial."

Drs. Alan Levin and Vera Byers, in the Occupational Medicine Reviews book,' prefer the broader view of this syndrome, and prefer the term "environmental illness. "They consider it to be primarily a disorder of immune regulation and cite many immune system abnormalities that are frequently found in such patients, including inappropriate responses to viruses, with Epstein Barr virus antigens found long after acute mononucleosis illness, slight Leukopenia, and abnormal helper-suppressor ratios with T lymphocyte suppressor cells frequently being found to be low. There is frequently an increasing sensitivity to body molds, such as Candida albicans and trichophyton. Such allergies frequently manifest clinically as chronic dermatitis, gastro-enteritis and depression.

Not infrequently, chemical exposure may lead to increasing body burdens of fat soluble chemicals which seem to have an effect on the immune system, reducing its effectiveness in dealing with many of the common immunologic stimuli, such as exposure to molds, pollens, grasses, etc., thus making the immune system less effective in dealing with "normal amounts" of these stimuli. This consideration has led to our use of the Hubbard Detoxification Program to reduce the body burden of fat soluble chemicals, thereby improving the body's immune system function somewhat to the point that it can better deal with environmental immune system stimuli. I will address this issue in somewhat more detail later.

IV. Diagnostic Considerations

When evaluating and caring for an MCS patient, acceptance and legitimization

of the patient's concern for his or her well-being is of great importance. Frequently, these patients have been to many different medical practitioners and have frequently ended up undergoing psychiatric evaluation with trial on psychiatric type medications, which almost invariably make the patient and the symptoms much worse. The concerned physician must not attempt to place the problem either in the patient's head or body, since indeed both are suffering. Most of all, the physician MUST LISTEN TO WHAT THE PATIENT HAS TO SAY. He must attempt to determine what it is that the patient is sensitive to, why is the patient so sensitive to this substance or substances, and how is the problem affecting his functioning in a social setting, both at home and at work.

Many patients arrive with a previously prepared and lengthy symptom diary, and with considerable information regarding chemical composition of household products to which they have been exposed. It is important for the physician to listen to these sometimes extensive histories, though some structuring to the interview must be made since without some limits, the interview is very likely to become frustrating to both the physician and patient.

A careful medical environmental and occupational history will elicit data about possible precipitating chemical exposures and the types of exposures that will lead to a reoccurrence of symptoms. The MCS patient may describe the onset of symptoms after an initial exposure to a single agent or a mixture of agents. These patients frequently then describe a generalization of their sensitivities to include a wide variety of environmental exposures to substances such as tobacco smoke, perfumes, automobile exhaust, clothing stores, grocery stores, etc.

There is a very useful concept called "total environmental load." This concept indicates that knowledge of all toxic exposures is necessary for predicting health effects of any single exposure. This total environmental load includes other environmental stressors, such as food intolerances, common allergies, or psychosocial stresses, and these all add to the burden that the environmentally ill patient must cope with. As this total burden increases, the likelihood of symptomatic reaction to any single environmental stressor increases, i.e. "the last straw concept." This total environmental load concept may not totally agree with the traditional understandings of antigen-specific allergy, but it parallels much research into the effect of social stressors on physical illness. McLellan feels that the usefulness of the TEL concept is that it demands a thorough biosocial evaluation of the patient.

Another useful concept is that a patient's environmental sensitivities may be masked by chronic exposure. The sensitivities only become apparent on provocative challenge after fasting in an environment free of most indoor pollutants. This is an area which is certainly worthy of further

investigation, but it has generally been excluded by most occupational medicine physicians because of a lack of environmental chambers in which to do research or even case definition.

A large variety of objective testing has been proposed to identify specific sensitivities which a patient may have. These include skin testing and RAST testing to help investigate food and common inhalant allergies; patch testing of the skin will help with determining skin sensitivities to common allergens. Blood anti-body profiles may be useful for identifying some specific sensitivities to chemicals, such as trimellitic anhydride, isocyanates, and formaldehyde. McLellan finds these tests to be not very helpful in evaluating MCS patients, but I use some of them and find that they are helpful. A provocative challenge may be useful in identifying chemical sensitivities and have included intradermal, sublingual, nasal, oral, face mask, and booth challenges. These provocative challenge tests may well hold considerable promise for evaluation of MCS patients.

Of course, usual medical disorders which might be occurring must be ruled out by routine chemistry and blood count batteries, electrocardiographic studies, and other studies, depending on symptoms (pulmonary function, chest x-ray, GI series, etc.) Not all of these tests will be required in any one patient, however.

Obviously, a thorough routine history and physical examination is mandatory to attempt to get to the bottom of the problem. Once "usual" medical diseases which might cause some, or most of the symptoms, have been ruled out, a diagnosis of Multiple Chemical Sensitivity Syndrome may be entertained. Occasionally, use of these tests will find other problems, such as parasitic disease, candidiasis, anatomic abnormalities in the upper airways, autoimmune disorders, etc. Most patients with only these types of problems will be relatively easily identified. Another area of investigation which is frequently overlooked, but is frequently very helpful, is neuropsychological evaluation to determine whether or not there may be some degree of organic brain syndrome, which could have resulted in brain damage from exposure to one or more chemicals, particularly the solvents or other psychoactive agents. At this time, a review of the patient's coping skills can be done, which will help with helping the patient with subsequent therapeutic approaches. McLellan feels that referral for psychiatric evaluation is often wanted, but I have not found such evaluation to be helpful in my practice. Patients with MCS commonly feel victimized, helpless, and misunderstood. Lifestyle restrictions and reduced social relations add to the psychological stressors on these patients. Psychological evaluation of the impact of these stressors may add considerably to the therapeutic planning so long as the assessment does not eclipse a thorough biologic evaluation. Assessment of the patient's nutrition is also important since malnutrition may result in many immune syndromes, skin rashes, and neuropsychiatric symptoms. Depletion of antioxidant reserves, or abnormalities of essential fatty acid metabolism, may also play a part, and should be evaluated.

V. Treatment

MCS patients have usually been exposed to a range of treatments, some of which may have helped, many of which most likely have not. Certainly avoidance of exposure to the known offending substance or substances, and to the subsequent substances which cause exacerbation of symptoms must be practiced. This can frequently lead to increasing social isolation. Patients are not uncommonly found to be wearing charcoal face masks, and sometimes full face respirators, so that they can cope with the commonly encountered environmental pollutants and can function outside their homes. Many have had to move to more environmentally acceptable areas in order to cope.

Though rarely "cured," the chronically ill MCS patient can minimize his physical and social disabilities by improving both behavioral and physiologic coping mechanisms. Physicians and their staffs who are seeing these patients have found that it is necessary to have, not only the medical and support staff avoid use of perfumes and aftershaves, but also instruct their other patients to avoid using them when coming to the office, since these offending substances frequently cause increases in symptoms for the MCS patients. Fortunately, smoking is being outlawed in most work places and certainly has no place in medical offices.

Improvement in the chemical tolerance by the patient can sometimes be achieved by dietary means and avoidance of offending foods; some improvements can be seen by treating for offending fungal diseases, such as candidiasis and other microbiologic illnesses; provocative challenge will frequently provide some relief of symptoms; and detoxification has, in my experience, been very helpful in treating MCS patients.

VI. The Hubbard Detoxification Program.

Over the past three years, I have treated approximately 120 patients with Multiple Chemical Sensitivity Syndrome using the Hubbard Detoxification Program. This program involves mobilizing the stored xenobiotics (toxic chemicals) which store in the fat, such as solvents, PCBs, pesticides, etc., and encouraging the removal from the body through excretion pathways, both through the bowels and through the skin. This is achieved by a graduated program of increasing aerobic exercise, increasing niacin dosage, and heat exposure in a heat chamber, to both promote mobilization and excretion of these xenobiotics. Patients are on the program approximately 4-5 hours a day, 7 days a week, and over a period of time, averaging approximately 3 weeks, the body burden of these xenobiotics is gradually reduced. A coincident improvement in their clinical status is apparent. Dr. Shields will present some cases from her office in Los Angeles, but suffice it to say that in my practice in Sacramento, we generally see an improvement from a minimum of 30 percent post- treatment compared with pre-treatment levels, to a maximum of perhaps 70-80 percent.