

On The Cutting Edge

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The 1980 story of the Environmental Protection Agency's medical science advisor becoming sick with multiple chemical sensitivity and seeking help from Dr. William Rea in Dallas, Texas.

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One day two years ago Dr. Lawrence Plumlee, medical science advisor at EPA Headquarters for the previous eight years, made a momentous personal decision to quit his job in Washington.

For years he had felt tired, depressed, and achy on days when the city's air pollution was bad. He had moved from the Maryland border of Northwest Washington to a townhouse one block from the Agency to avoid the daily drive through auto fumes. He had special vents installed in his office so that the positive air pressure would reduce the amount of tobacco smoke drifting in. At his own expense he had installed air cleaning equipment.

These measures helped temporarily, but they did not arrest his downhill slide in health. He often felt as if he had a bad hangover, and his muscles and joints ached. At times he had trouble concentrating. Although his job as advisor to the Deputy Assistant Administrator for Health and Ecological Effects required him to attend many conferences, he cut back sharply on travel because he found that the tobacco fumes, fumigants, and cleansers impregnated in hotel drapes and carpets aggravated his symptoms. In fact, the only time he really felt well was when he moved to New Hampshire on extended leave to get away from the city. Over the years he has watched his weight gradually drop from 135 to 93 pounds.

And so Dr. Plumlee, a graduate of Johns Hopkins Medical School, with post-graduate training in the physiology of environmental stress and lengthy research experience in this subject at Walter Reed Army Institute of Research, gave up his government career and moved to the Ozarks.

Today he lives in the town of Sulphur Springs, Arkansas, where the air is clean and the nearest city is 50 miles away. As he puts it, "I had become so ill that although I loved my job at EPA, it didn't seem feasible to continue. It's difficult to put a price on health."

Dr. Plumlee is an example of a rapidly growing group of people who find that they are overloaded from our polluted environment. It is becoming known that all humans have to deal with this increase in environmental load just to function. Some authorities estimate that perhaps as much as 40 percent of the population are adversely affected by some aspect of environmental pollution at one time or another.

Dr. Plumlee owes part of a new outlook on life to the Environmental Control Unit of the Brookhaven Medical Center in Dallas, Texas, where he receives treatment. The unit, directed by Dr. William Rea, a member of EPA's Science Advisory Board, has gained international attention in caring for patients with acute sensitivities to chemicals and other substances. Dr. Plumlee has gained back some weight and has begun to improve under the unit's care. He shares the enthusiasm of many patients for the scientifically valid but non-traditional approach of the unit, which employs special methods in diagnosing the causes of "environmental overloads" and protecting patients from those substances that afflict them.

"I'm very fortunate to be here," Plumlee declared to this writer during a recent visit to the unit.

Dr. Rea's methods of diagnosis and treatment show a sharp departure from established ways of testing for other more conventional illnesses. "Toxicologists, whose focus is the study of homogeneous strains of rats and mice, simply don't appreciate that safety factors of 100 or 1,000 such as are used today for common chemicals do not protect a sizable number of people," Plumlee commented.

The Dallas facility was established by Dr. Rea after he drew upon his knowledge of his own health problems, studies of work by Dr. Theron Randolph, and his own background as a cardiovascular surgeon, to extend the innovative approach to the ills of what has been called our "chemical society." Dr. Rea had become an established specialist in thoracic surgery in Dallas. But after several years of practice, he found that fumes from the anesthesia in the surgery room were making him ill. Even giving a patient a bronchoscope exam left him with headaches, since the patient was breathing anesthesia fumes into the physician's face. Worried about his ability to continue work, he determined which substances affected him and after avoiding them for months, he found he was able to tolerate these same chemicals better.

The experience prompted him to plunge into a field that appeared first to be entirely different: How the uniqueness of each person is brought out dramatically, often manifested as disease, but in the manner in which people react to ordinary

environmental factors. However, it fitted perfectly into his specialty in cardiovascular surgery since that knowledge could be applied in solving many of the perplexing problems he faced. It gave some answers in many instances to such illnesses as intractable phlebitis, uncontrollable arthritis and lung failure.

One of the most helpful sources of information was Dr. Randolph, a Chicago specialist in internal medicine and allergy who had studied more than 20,000 cases of petrochemical hypersensitivity during the last three decades. Dr. Randolph, who received an Environmental Quality Award in 1976 from EPA Region 5, found many people whose illness was directly related to common chemicals that seemingly did not affect the general population despite daily exposures of both groups.

After two years of consultation with Dr. Randolph, Dr. Rea campaigned among his colleagues and the public and supervised the creation of a 26-bed environmental control unit at the Dallas medical center in 1975.

Among those physicians who joined Dr. Rea's staff after learning of his work was Dr. Robert Stroud, a rheumatologist, editor of the *Journal of Allergy and Clinical Immunology*, and formerly on the Allergy and Clinical Immunology Research Committee, National Institute of Allergy and Infectious Diseases.

To enter the Brookhaven Environmental Control Unit is to walk into a different world. It is sealed off from the rest of the center by double glass doors. The air used for heat and air conditioning is specially filtered. The rooms are constructed of aluminum, steel, ceramic tile and porcelain surfaces. Floors are all stone or hard vinyl. Curtains are all cotton. A patient who wants to read a paperback book uses what resembles the nuclear industry's "glove box" where the books are contained under glass and the patient handles them with protective gloves built into the compartment. (The paper and ink contain several chemicals that can cause allergic reactions, so they are isolated like some dread bacillus.)

Despite this seemingly cold decor, patients find a unit a relief to enter because they are protected from the host of substances to which exposure results in physical and mental misery. For some, it is the only kind of environment in which they can live and breathe comfortably. Indeed, Dr. Rea remarked to this writer during a recent visit, "Did you notice how I hung around in there while talking to you? It's because I feel so much better in those rooms." Although the average healthy person is unaware of it, a number of synthetic fabrics, soft plastics, and construction materials give off fumes that causes a whole spectrum of reactions in many individuals. Part of the treatment is to remove from the patient's environment those materials likely to undergo this "outgassing."

What causes certain people to develop hypersensitivity to the various chemicals in our society?

Dr. Rea explains it with what he calls his “full barrel” analogy.

“Those patients with chemical overexposure are somewhat like a barrel being filled up,” he says. “When the barrel finally overflows, you begin to see symptoms. But something else happens. Once the overflow load is reached, you don’t need a lot of a chemical pollutant to produce these symptoms. Just a minute amount, even one or two parts per billion either inhaled or swallowed, is enough to trigger very serious reactions.”

To get an idea of how overloaded these patients are, one only has to read a sign at the portal of the unit: “Do not enter this area if you are wearing perfume, hair spray or aftershave lotion.” One whiff is enough to cause some patients to go into convulsions, become unconscious, or experience other symptoms such as skin rashes, bruise marks, labored breathing, muscle contractions, and irregular heartbeats. As one nurse remarked, “If a woman walked through here wearing cologne, she’d leave a trail of bodies on the floor.”

Although it is known that exposure to some chemicals greatly increases a person’s risk of cancer, chemicals can trigger other diseases such as arthritis, bronchitis, phlebitis, an impairment in reading ability known as dyslexia, and even in rare instances multiple sclerosis. And as our industrial society develops more and more chemical products, the medical profession is having to grow ever more sophisticated in dealing with chemical victims.

As Dr. Rea puts it, “Medical environmental technology is about 100 years behind environmental technology. The environmentally contaminated situation present today would be similar to the time when people were rubbing manure into wounds, or physicians were doing pelvic examinations after a post mortem.” What his hospital unit does, among other things, is to put patients into a relatively unpolluted world where all the contaminants they are exposed to daily are removed. That itself is a departure from medical routine, because as Dr. Rea points out, offending substances are readily found in the average hospital, ranging from polyester draperies and carpets to the plastics found in telephone wire (not to mention nurses wearing hair spray).

The typical new patient at the Brookhaven unit must remove all cosmetics and don 100 percent cotton clothing. All medications are halted, and the patient takes no food so that his body processes can return to normal metabolic balance and

stability by elimination or neutralization of toxics, or recover from immunologic and enzymatic distortion. Even drinking water is specially filtered to remove chlorine and pesticide residues. The fasting may continue for days until symptoms fade away. During this period the patient maybe undergo severe withdrawal symptoms in the absence of foods or chemicals that have been in his or her environment, much as an alcoholic suffers during a “drying out” period.

After years of study, Dr. Rea and his colleagues have worked out to an astonishing degree the many controls that must be imposed to keep the Brookhaven unit free of contaminants. Walls are made of glass and cement blocks, painted with a “low outgassing” paint that had been allowed to dry up to one year to eliminate any volatile petrochemicals. Floors are of terrazzo tile or hard vinyl, also allowed to age. Beds and furniture are all metal or hardwood. Bed linen and curtains are 100 percent cotton laundered in pure non-detergent vegetable or animal soap. Filters of activated charcoal and other substances at the entrance eliminate any odors or fumes that might come through the doors. Even the hospital beds are hand-cranked, since electric motors gives off invisible but troublesome fumes.

The Brookhaven unit maintains its own kitchen for the preparation of chemically less contaminated foods. It contracts with private growers to ensure the quality of the farm products and constantly test samples of the produce. The unit also uses brands of mineral water since tap water contains chlorine and other unwanted chemicals. The table where these brands are kept resembles a gourmet counter, with bottles of Perrier from France, Fiuggi from Italy, and Bru from Belgium.

All patients during diagnosis and treatment are kept in the unit for at least 16 days. When the symptoms disappear, usually after several days of fasting, and the patient is able to sleep all night, he or she is given chemically less contaminated foods that have not been subject to pesticides or synthetic fertilizers, to see if it is the food itself or the chemicals used by farmers that causes the reaction. If the patient comes through this test without a noticeable reaction, regular commercial food is tried next. Such products, Dr. Rea points out, have been contaminated by synthetic sprays, herbicides, preservatives, artificial coloring and sweeteners, and wax and plastic wrappings, and have been cooked on gas stoves in synthetic pots and pans. So there are many ways in which foreign substances can affect patients, and reactions are closely observed and monitored.

In addition to testing them with foods, physicians expose patients in a separate chamber to small quantities of chemicals and record their reactions. This is usually done putting an open jar containing a so-called safe ambient dose of a chemical, as defined by government and industry, near the patient. Such a dose is equal to what the person would encounter in daily life. The exposures are done in

a double-blind manner, that is, using a procedure where the patient doesn't know which of the samples contain a chemical or an inert, harmless substance.

Other tests include exposure for a few minutes to a stove pilot light of natural gas, cigarette smoke, perfume, pine scented floor wash, and chemicals found in carpets, foam pillows, and polyester clothes which a person would contact daily at home or work.

The task is complex, for as Dr. Rea never tires of explaining, the amount and scope of pollution that has crept into the environment is enormous.

“Most public water systems are overloaded with synthetic chemicals that increase the exposure to synthetics from 1,000 to 10,000 times,” he says. He points to EPA studies of the 83 largest cities showing all their water supplies to be chemically contaminated. “Ninety-four percent of the commercial food has pesticide in it, and the average individual ingests an estimated one gallon of food additives per year,” he adds.

The most polluted place in the environment appears to be the average home, with its many synthetics, foam rubber in beds and chairs, and often-encountered gas heat.

The combination of these substances at home with a polluted work environment produces a massive increase in body load that the individual has to handle just to function each day, he emphasizes. This often becomes too great for people with certain hereditary and acquired traits, results in increasing individual susceptibility, and paves the way for inflammatory diseases, he explained.

“It is insufficient to have sick people get to feeling better; they must be helped to discover for themselves that their illness has been caused, and how. This gets their attention and helps them become responsible for completing the testing and retesting on their own after leaving the Environmental Unit,” he stated.

After the Brookhaven doctors have determined which substances have provoked reactions in a patient, the next step is to draw up a program of avoidance so that the individual can get back to leading a normal life. For some, it's merely a matter of restricted diets and avoiding certain chemicals. For others, it may be an elaborate and costly change in their dwellings, a job change, or even a move to a remote location far from industry and traffic. In one case, a woman who has been teaching in Los Angeles moved to a mission school in Guatemala. She felt so much better working there that she now comes back to the United States only on

summer vacations. She has lost all her chemical sensitivity and is pursuing her PhD.

Another patient told this writer her solution was to change her home completely. She removed all carpets since they contained formaldehyde to which she was sensitive. She got rid of all spray cans around the house. She even switched to a special brand of lipstick made with beeswax.

To the outsider, it can be a disturbing experience to see how a sensitized person reacts to invisible pollutants. Consider the case of one attractive woman who formerly had worked as a nurse in South Carolina. A year ago local authorities had sprayed her neighborhood for mosquitoes following a hurricane, and the pesticide affected her so profoundly that she began having seizures.

“Every time I went outside the house I wound up in the hospital,” she explained. “I slept constantly. I was working in a surgery room, but I became ill there. I underwent personality changes and became irritable, nervous, almost paranoid.”

The woman now works on Dr. Rea’s staff as well as receiving treatment there. She was relating her experiences to this writer in a calm, cheerful manner when someone dropped a small vial in the corridor outside the room. Within seconds the woman began writhing in pain, slumping in her chair and trembling. Dr. Rea stepped to an oxygen tank, handed her the hose, and turned it on. Within two minutes she was back to normal and talking again. The cause of the distress: a small container of extract of sesame, used to test other patients, had accidentally tipped over. Although the odor would not have been detected by a normal person nearby, it was enough to bring on her seizure.

“It is critical to the appreciation of this scientific and conservative method of study to understand that the principle of symptom suppression in the form of drugs, medicines and injections is very nearly incompatible with the success of this procedure. Drugs must be used with great caution, and their use generally prolongs the diagnostic periods. They must be used with great care and under strict supervision later, in the rehabilitation phase,” one colleague of Dr. Rea observed.

In dealing with severe cases of chemical overload, Dr. Rea sometimes encounters patients so damaged by environmental pollutants that their general resistance to illness is lower. They have recurrent infections, colds, influenza, and asthma attacks. “We have found changes in the immune and biological amplification systems in many patients,” he declares. “Over 50 percent of our patients are T-lymphocyte-depressed, and another 25 percent have poor functioning T-

lymphocytes. At times many other lab tests are abnormal.” (T-lymphocytes are white blood cells produced by lymph tissue. They can kill off tumors and are thought to be part of the body’s immune system.)

For a number of these patients, Dr. Rea has been working in collaboration with Dr. Amanullah Khan, also a member of EPA’s Science Advisory Board, in another advanced field — the use of transfer factor to raise a patient’s general resistance.

Transfer factor was discovered in 1955 by Dr. H. S. Lawrence of New York University. Scientists do not entirely understand the nature of this substance, but it seems to help transfer some people’s immunity to disease to others. It is stored in the white blood cells and released when the body is invaded by something foreign, such as a skin graft, bacteria or cancer cells. It then activates disease-fighting white cells which in turn attack foreign substances. Dr. Khan, who is Chairman of the Department of Immunotherapy at the Wadley Institutes of Molecular Medicine in Dallas, explained that transfer factor is obtained by using an experimental machine known as a Celltrifuge, which pumps blood from the body and under centrifugal force separates it into various components.

“We have found that transfer factor improves cellular immunity in a patient,” Dr. Khan said, “such as asthmatics who have frequent infections.” The substance also is used to treat a number of other illnesses including virus infections. The Wadley Institutes are particularly well equipped in this field as their central blood bank is the largest of its kind in the Southwest, serving 36 hospitals.

Dr. Khan is working with a technique to determine whether a patient’s white blood cells react to the environmental pollutants by noting the level at which a pollutant interferes with the person’s natural immunological system. “We test the ability of the patient’s white blood cells to produce interferon. If it’s not normal, we know there may be a defect in the resistance to invasions,” he explains. “We can use it as a test to screen carcinogens, which inhibit a cell’s ability to produce interferon.” (Interferon, discovered in 1957, is a chemical produced naturally by the body that acts to help the human system defend itself against viruses. It is being tested widely as a weapon against cancer.)

The method at Wadley to measure interferon levels has attracted attention because it is easily set up, has also been tested in laboratory equipment by others against a variety of industrial chemicals, is sensitive to low levels of pollutants, and can be applied cheaply to large numbers of patients simultaneously since the process makes use of a computer. Physicians estimate the cost for the immunological procedure could run as low as \$5 per test series. Observers believe this approach could be a valuable supplement to the medical profession’s other far more costly

ways of dealing with suspected chemicals. (Assessing the long-term or chronic effects of a chemical is a notoriously difficult task. A single test for a chemical's cancer-causing ability, for example, may take up to three years and cost \$250,000 or more.)

What lies in the future for our "chemical society"? As of now, it seems certain that the case load for specialists like Dr. Rea won't get any smaller. Already several patients from the Love Canal chemical disposal site have been treated at the Brookhaven unit, and many similar sites post potentially similar hazards. Dr. Rea's innovative approach has attracted patients from as far away as England, Australia, Canada, Hawaii, and the Bahamas. Some 85 percent of those suffering from migraines and vascular headaches are reported improved, as are 80 percent of rheumatoid-arthritic cases, he reports.

The result of all this is, in his words, that "demand is just ferocious." More than 1,000 patients have been treated at the unit, and it is booked ahead to next January, with a waiting list of patients seeking admission. The Brookhaven unit is planning to add 50 more beds, although it already is the largest of five such environmental-control units in this country. (The others are in Zion, Ill. where Dr. Randolph works; Whiteville, N.C., Denver and Watertown, S.D.) Word of their techniques has spread abroad, and a similar unit has now been set up in England by Dr. Richard Mackarness, author of *Eating Dangerously: The Hazards of Hidden Allergies* (Harcourt Brace Jovanovich, 1976).

Although the layman may regard the patients at Brookhaven as rare, isolated examples of human sensitivity to environmental stress, some medical authorities feel that these patients are a kind of early warning system for the whole population. "They are one end of a spectrum that includes us already," declares one specialist, "since most of us are now affected to one degree or another by traffic fumes, monosodium glutamate in our food, by migraine headaches, by rough, inflamed hands from detergents, by pesticide allergies, and so on." And with the large number of chemicals being added to our environment each year, authorities are growing more concerned about the ability of the general population to accommodate to this increase in pollutants.

Physicians have a number of sophisticated devices for special therapy that seem futuristic to the layman. There is a machine to perform plasmaphoresis, for removal of plasmas from the blood, and another for leukaphoresis, to remove white blood corpuscles. Using this technology, specialists may some day pump blood from a patient into a chamber where they can remove unwanted chemicals.

“But to tell you the truth,” observes Dr. Rea, “nothing seems to be quite as good as simply getting the chemical load of a patient down with the methods we now use. What we need is clean air, clean food, and clean water.”

Truman Temple was editor of the EPA journal, which ceased publication in 1995.

Dr. William Rea continued to specialize in environmental medicine until his death in 2018. He had to close his environmental control unit in the 1990s when insurance companies stopped paying for the treatments.

More MCS history

See www.eiwellspring.org/history.html