

**Progressive Lower Extremity Weakness that Occurred in an Individual
who had had Prolonged Exposure to a Laptop Computer.
By Burton A. Waisbren, M.D. FACP**

Epigram: There is nothing new under the sun - what happens will happen again.
(Ecclesiastes 1.40)

This anecdote is being presented on the internet because in this day and age the internet appears to act as the most efficacious way for physician to share unusual experiences with their colleagues.

This story is about a patient who had a syndrome which was originally diagnosed as amyotrophic lateral sclerosis (ALS) but that may be due to prolonged use of a laptop computer.

The patient is a 58-year-old computer consultant who has lived all of his life in a tick area in central Wisconsin. In connection with the travels due to his occupation he had had in 2003, a full course of Hepatitis B vaccine.

His search on the internet revealed this website which discusses a possible relationship of ALS to Lyme disease and the occurrence of demilitarizing diseases after Hepatitis B vaccination. For these reasons, he presented himself for a consultation in July of 2008.

He was in a wheelchair because of his bilateral leg weakness.

The essentials of his history are that he had always been in perfect health until early 2007 when he began to develop weakness in both legs that was progressive and seemed, in addition, to be involving his upper torso. He had seen two neurologists who confirmed that he had weakness in both legs and had found abnormalities on an EMG of his lower extremities. A lumbar puncture and MRIs of his brain and spinal cord did not reveal any abnormalities. Both neurologists thought that he might have early ALS.

The only positive findings in my physical examination were absent abdominal

reflexes, absent ankle reflexes, and weakness of his legs for which he had begun to use a wheelchair.

At a post consultation conference, between myself, the patient and his wife I shared with him my experiences with ALS. I have discussed these experiences with ALS and Lyme disease in a previous essay on this website. In addition, I had seen 5 patients whose classic ALS had appeared after electrical exposures.

Brief summaries of these 5 cases are as follows:

Case 1: In the late 1980s when I became involved with ALS because of the fact that some cases with the syndrome showed exposure to Lyme disease, an electrical engineer presented himself with classic progressive ALS. He had come to the conclusion that his ALS was caused by electrical emissions put out by a defective electrical rocker in which he had sat in each evening for several years while he watched television. He became of the opinion that electrical fields generated by this rocker caused his condition. He was qualified to test his hypothesis and he did find out that the rocker did generate what was in his opinion an abnormal electrical field. I did not have the background to understand this but was impressed by his intelligence and expertise.

He did not respond to the immunologic approach to ALS that I was working with at that time. His disease progressed and in a year he died of respiratory failure.

Case 2: The first patient had studied the literature of ALS and had found that ALS had been found prevalent in professional athletes. In fact at that time, the fertilizer milorganite that was put on football fields had been suggested as a cause of ALS. In addition, the first patient had read an article written by John Waters that described his

case of ALS. He thought that perhaps Mr. Waters ALS may have been due to electrical exposures that he had received in his professional football teams' conditioning facilities. He called Mr. Waters who told him that, in fact, he had spent many hours getting diathermy and other electrical exposures in his training room in an attempt to relieve the aches and pains occasioned by his occupation as a quarterback. When Mr. Waters had suggested that the training room exposures may have caused his ALS to the officials of his team they broke of contact with him.

I then called Mr. Waters who affirmed the fact that he had spent many hours receiving diathermy and other electrical stimuli in the training room of his football team. His relationship with the team had soured and he had now started a new job as a football coach. He died several years later of ALS.

I contacted the team physician to find out more about the electrical apparatus used in the training room but my letter was never answered. A letter I wrote to the football leagues national office inquiring about what regulations they had in place regarding the monitoring of electrical apparatus in use in their teams training facilities was never answered.

Case 3: In 1905, I received a telephone call from a Canadian electrical engineer. I do not know how he learned of my interest in electrical discharges as a possible cause of ALS. He told me that he had rapidly advancing ALS and that his job as an electrical engineer was diagnosing and correcting defects in electrical motors. Over the years this activity had repeatedly caused him to receive many electrical shocks.

He asked me whether I thought his ALS might have been caused by these shocks. As I

remember it, I shared my experiences with him about cases 1 & 2, and told him that I thought a possibility existed that these electrical shocks might have been involved in the pathogenesis of his disease. I asked him to send me the details of his case. I never heard from him again, perhaps because I told him there was no proof of this hypothesis.

Case 4: In the mid-1990s, an article appeared in an issue of the Journal of the American Medical Association. It was authored by a physician who described his own case of ALS. He stated that his symptoms appeared after he received a shock from a defective electrical drill. He asked in the article if anyone had seen a similar case. I wrote to the physician outlining cases one and two in this essay but I never received an answer. I did not follow up because I did not want to add to his problem.

Case 5: In early 2005, I treated a proven case of severe ALS with Ceftriaxone (Rocephin) because of the possibility discussed on this website that there might be a relationship between ALS and chronic Lyme disease. In answer to my question as to whether he had ever been exposed to radiation of any type he stated that he had been exposed every day in practicing his occupation as an electrical welder.

His treatment did not seem to be helping him and he left my care without providing me with any details regarding possible electrical emissions put out by the welding equipment he had been using.

After I got done sharing the above experiences with my patient, his face lit up. He told me that in connection with his profession as a computer consultant he had spent many years, before his legs became weak, with a laptop computer on his lap. He asked me if I

thought electrical emissions from his laptop computer had caused the weakness in his legs. I thought his suggestion certainly seemed reasonable, particularly because the presentation of his syndrome was atypical of what is usually found in ALS that we should pursue the matter farther.

Even a cursory look at the internet suggests the hypothesis that electrical emissions from a laptop computer seems reasonable as a cause of a neurologic syndrome. It is outside the realm of this presentation to discuss all that is on the internet but the next essay will summarize some internet discussions regarding the dangers of electrical emissions.

Our next approach to the key case was to search the internet for experts in this field whom we could consult. Dr. James DeMeo and Dr. Sam Milham surfaced. They both answered my queries and kindly gave their permission for me to include their answers on this essay.

Dr. DeMeo, who is the director and owner of the National Energy Works in Ashland, Oregon, who has spent many years studying low-level EM fields, answered my e-mail as follows:

“I have been working in the field of environmental protection from ‘low-level’ EM fields for over 30 years, and so would recommend firstly that any of your patients who use a ‘laptop’ computer, never, never use them on their lap. While the LCD screen of the typical laptop computer has a fairly low emission and is not significantly measurable at the usual distances from screen to head, the case of the laptop is filled with all sorts of electronics which give off fairly strong fields -- and since the person puts it on their lap, they get a fairly high exposure from that. They should be used on a table-top only. Also

for the more sensitive people, resting their hands on the laptop also gives problems, as the hands are exposed. This can be dramatically reduced by using a typical USB type of external keyboard -- not a 'wireless' one which should be avoided at all costs, but one with a hard wire. Also to never use 'wireless' systems which work in the microwave bands.”

Comment:

The Magnetic field exposures of the patient was then determined by a Trifield Broadband Meter obtained from the company that Dr. DeMeo heads.

Figuring that the patients' femoral motor nerves were exposed at about 5 inches from the computer's screen, his motor nerves were exposed to between 3 and 4 milligauss fields for a total of 2,000 hours during the two years before his symptoms appeared. The caveat regarding this approximate exposure determination is that most electrical engineers discount magnetic field determinations that do not take into consideration the background magnetic field of the earth itself. Be that as it may, a computer user may want to determine how large a magnetic field they are exposed to from their computer at the distance their motor nerves are from the computer screen or the computer itself. They might also want to test their cell phones in the same way. A more accurate measure, of course, would result from the use of the SAR determination, as hopefully will be available regarding their computer and/or their cell phone. (The study amount of energy absorbed by one kg tissue.)

Dr. Milhams' answer to my e-mail is as follows: (25)

Dear Dr. Waisbren,

I was referred to your website by Louis Slesin, editor of Microwave News. I'm convinced that ALS is caused by electrical exposure. Years ago Deapen et al showed that ALS was more common in people who had received a serious electrical shock and it is more common in electrical workers. I think that it will ultimately be related to high frequency voltage transients (**dirty power**). Laptops and a lot of other modern electrical equipment generate dirty power. I'm attaching a copy of a paper about **dirty power** <https://fortress.wa.gov/doh/occmort>.

Dear Dr. Waisbren,

I bought a meter which measures the WiFi fields put out by laptops. It is an Electrosmog Meter available from www.lessemf.com for \$199. Its readings agree with those of my other meters, but this one automatically changes the readout units with a press of the button. If you got one of these meters, you could easily measure any laptop. Just make sure that the WiFi switch is on.

Your patient's IBM Thinkpad laptop emits microwave radiation in the band 60MHZ to 3.5GHZ at a maximum intensity of 8.67 V/M electric field, 23 mA/m and 19.95 uW/cm squared. The magnetic field readings were 12 mG with a Bell triaxial meter and 3.5 ,G with your Trifield meter. The Russian standard at these frequencies is 2.5 V/M based on human experimentation and biologic end points. There is no US standard.

I think that you should be very careful in associating nerve damage with computer exposure. Only when a laptop was used extensively on switch on, but my wife's Dell doesn't unless she is in a WiFi environment.

I'll pack the laptop and return it tomorrow.

Best, Sam Milham

After Case 1, I reviewed the internet literature and some published literature regarding the possibility that laptop computers could cause an ALS like syndrome, we decided on the following course of actions.

1. The patient will take his laptop computer off his lap and follow the suggestions made by Dr. DeMeo.
2. We will perform an electrical check of the patients' computer with the advice of Dr. DeMeo. This was done. The computer was tested in a lead free room by a Company in Cedarburg, WI, that specializes in testing electrical equipment in regard to its compliance to national and international regulations. The computer passed all tests.
3. Since it is a well known fact, that searching for 'needles in a haystack' type of adverse reactions by epidemiologic studies is usually futile. Accordingly, we would propose to our colleagues, who are equipped to do so, that they do surrogate studies that might lend credence to our hypothesis. I define surrogate studies as those that will not prove an association of an event to an untoward reaction but that will lend credence to the hypothesis that it might occur. These surrogate studies are those that will use experimental models of animals that will develop syndromes like ALS and that would use cell cultures of the types of cells involved in ALS, which could be exposed to laptop computers. The end points would be the shorting of incubations periods in animals and changes in the glutamate and EAAT2 levels in cell cultures and in the animals.

The present status of the key patient – March 2009

The patient is considering the following options:

The key patient has continued to have increased weakness of his lower extremities and

upper extremity strength as well. In spite of a course of antibiotics given orally for the possibility that Lyme disease may be involved. He is considering the following:

1. A course of intravenous Ceftriaxone based on Rothstein's work.
2. Having himself tested for the A-T gene that might be the cause of his difficulties;
3. Having his farm house tested for the "dirty electricity" as described by Dr. Milham;
4. Taking Rilutec, the traditional present treatment for ALS or seeking other opinions regarding his case.
5. He may seek other consultations;
6. He may just let nature take its course, with the hope that he has a benign case of motor neuron disease.

Conclusions:

Readers of this essay, who was probably directed to it by a search engine that picked up their interest in the subject, may react to it in more than one way.

They may decide to ignore it because of their opinion that anecdotal reports have no use in science.

They may want to follow Dr. DeMeo suggestions regarding the use of laptop computers.

They may want to study or have studied the electrical emissions of their laptop computers.

They may want to do or encourage the doing of the type of surrogate studies that are suggested herein.

If they come across similar cases, they may want to share their experience in this regard with the authors of this website and with their colleagues through the internet.

References

A. Computer/VDT Screens:

<http://www.hps.org/publicinformation/ate/faqs/computervdtscreen.html>

B. Glutamate:

<http://www.alsa.org/research/article.cfm?id=826>

C. Evert C.A. Kaal, Henk Veldman, Peter Sodaar, Elbert A.J. Joosten, P.R. Dop Bar, J.Neurosci. Res. 54:778-786. 1998. 1998 Wiley-Liss, Inc.

Oxidant treatment causes a dose-dependent phenotype of apoptosis in cultured motoneurons

<http://www3.interscience.wiley.com/journal/5005914/abstract?CRETRY=1&SRETRY=0>

D. Mcielska ME, Djamgoz MB

J Cell Sci, 2004 Apr 1;117 (Pt 9):1631-9

<http://www.ncbi.nlm.nih.gov/pubmed/15075225>

E. Health Effects and Exposure Guidelines Related to Extremely Low Frequency Electric and Electric and Magnetic Fields - An Overview

<http://www.bccdc.org/content.php?item=196>

F. Cell culture studies: Don Cleveland PhD

<http://cancer.ucsd.edu/summariess/dcleveland.asp>

G. Silani V.; Braga M.; Ciammola A.; Cardin V.; Scarlato G.

Motor neurones in culture as a model to study ALS

Journal of neurology. Supplement ISSN 0939-1517

<http://cat.inist.fr/?aModele=afficheN&cpsidt=1353617>

H. John Crow M.S., PhD.

Promising Results in Animal Model of ALS Reported

<http://www.rideforlife.com/archives/000628.html>

I. ALS – Electrical shock

Epidemiology – Fulltext: Volume 11(5) September 2000 p 539-543

www.epidem.com/pt/re/epidmiology/fulltext

0001648-2000090000-00009/jt,'ksessopmod=GTyVq7KvQ3FhVLjsXyLoPX... similar pages

J. EMFs In The Workplace

<http://www.cdc.gov/niosh/emf2.html>

K. Davanipour Z, Sobel E, Bowman JD, et al. Amyotrophic lateral sclerosis

occupational exposure to electromagnetic fields. Bioelectromagnetics

1997;18:28-35.

L. Rothstein, J. Clinical Trials.gov
ClinicalTrials.gov/ct2/show/not/0034922?Term=motorttdisease

[View our Notice of Privacy Practices](#)

DISCLAIMER

THIS WEBSITE DOES NOT PROVIDE MEDICAL ADVICE. The contents of the Waisbren Clinic website, such as text, graphics, images, and other material contained on the Waisbren Clinic website ("Content") are for informational purposes only. The Content is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read on the Waisbren Clinic website! If you think you may have a medical emergency, call your doctor or 911 immediately. Reliance on any information provided by the Waisbren Clinic, Waisbren Clinic employees, or other visitors to the website is solely at your own risk.