Recognizing Neurotoxicity in DOD Herbicide Era Veterans 1962-1975

As most of you know in my reviewing of studies on the herbicides I have pointed out that neurotoxicity within the Rainbow of herbicides seems to be overlooked or at least minimized in any effect on the DOD Herbicide Era Veterans 1962-1975, including the reasons for suicides.

Studies have pointed this out, including Ranch Hand that these toxic chemicals do have a neuropsychological/neuropsychiatric connection.

The EPA reassessment of dioxin states: (2)

· The EPA has concluded that dioxin is more dangerous than previously thought, even at extremely low doses. It accumulates in the body fat and once in the body, even at very minuscule amounts, interferes with cell development.

· The "brain may be particularly vulnerable" to accumulating dioxin into its fat content. Nervous system tissue itself, with its high lipid content, can also act as a repository for dioxin.

· Dioxin is now known to interfere with the most delicate balanced biological process in the body.

· The EPA also emphasized that dioxin damages the immune system directly and indirectly. This is the worst of all immune damage scenarios.

· "In 1977, the Working Group of the International Agency for Research on Cancer (IARC) found that neurological and behavioral changes were among the most frequently reported effects in studies of exposures to 2,4,5-T (IARC, 1977a). (13)

· IARC identified 6 out of 7 different populations occupationally exposed to chlorinated phenolic compounds where neuropsychological symptoms such as neurasthenic or depressive syndromes were established (IARC, 1977b). (13)

· IARC noted that PNS damage was also found in the same six dioxin-exposed populations, including polyneuropathies, lower extremity weakness, and sensorial impairments (sight, hearing, smell, taste). (13)

· In 1986, the IARC clearly restated it's finding that dioxin had been found to be associated with peripheral neuropathies and personality changes (IARC, 1986). (13)

From my book:

"Evidence also reveals that Dow Chemical, a manufacturer of Agent Orange was aware as early as

1964 that TCDD was a byproduct of the manufacturing process. According to Dow's then medical director, Dr. Benjamin Holder, extreme exposure to dioxins could result in "general organ toxicity" as well as "psychopathological" and "other systemic" problems." (19)

One of the problems it seems is not that science itself has not recognized the neuropsychological/neuropsychiatric properties but VA//VACEH/IOM are incessant regarding this unproven dose response. In fact, this 1964 statement is subjective by adding the word extreme. When in fact, the test and measurement equipment back then could only measure down to about 1 part per million. Therefore, what was extreme in that statement? We will never know.

Studies now show that even in very small amounts in the parts pre trillion range and even lower can create biological process damages in some people.

It seems VA/VACEH/IOM has not come to grips with the possibility of any of the dioxin isomers or related isomers, picloram, hexachlorobenzene, cacodylic acid being any such thing as neurotoxic. Any neuropsychological issues, personality changes, or strange behavior by Vietnam Veterans was and still is all blamed on PTSD. When it could be both or one exacerbating the other.

Recognizing Neurotoxicity from a legal aspect.
(If Veterans were given that opportunity, which at present is not likely.)
By Raymond Singer and Dana Darby Johnson

The symptoms of brain injury from exposure to hazards like lead paint and toxic chemicals vary widely. Nevertheless, there are ways you and your experts can pinpoint the damage and its cause.

Neurotoxicity—poisoning of the brain and nervous system—is a well-documented effect of exposure to many widely used chemicals, yet doctors (and lawyers) often fail to recognize it. Chemically injured clients often report a confusing array of symptoms, with no medical diagnosis. The symptoms may seem vague and unconnected, leading you to wonder, "Could these symptoms really be caused by a chemical exposure?" Once you recognize the signs and understand them in context—as a constellation of symptoms resulting from a toxic injury—you will have greater confidence in bringing your client's case to justice.

A person who has suffered a serious chemical injury is likely to have sustained considerable damage to his or her brain and nervous system. This is important for a lawyer to know, because doctors often recognize only the person's physical illness, not realizing that serious brain and nervous system damage may have also occurred.

Neurotoxicity can be documented, but perhaps not in the way you might think. A person's ability to think, perceive, control emotions, plan, and manage his or her life can diminish drastically

without anything being visible to a radiologist or neurologist on an MRI or a CT scan.

The most reliable and widely accepted way to assess actual brain function is through neuropsychological evaluation. (This is true for head-injury patients and those suffering from dementia, as well as those affected by exposure to toxic chemicals.)

Researchers have noted that imaging techniques are often of little value in evaluating neurotoxicity. In our and others' experience, imaging techniques can occasionally pick up abnormalities caused by neurotoxicity and may be helpful for forensic purposes, but they are not cost-beneficial for routine screening.

Neuropsychological testing tends to be more sensitive to brain injury than CT and routine MRI scans, which provide only a static and relatively gross view of neural structure. In one study of six head-injury cases, CT and/or MRI scans yielded little or no evidence of neuropathology as detected by neuropsychological testing.

Positron emission tomography (PET) scans, however, corroborated the impaired function. PET and SPECT (single photon emission computed tomography) scans offer a more dynamic look at brain structure, but both of these tests still need interpretation as to the cause of the abnormality (which could be benign).

Common symptoms

What do chronic pain, anxiety, neurological problems, confusion, psychiatric symptoms, and cognitive declines have in common? They can all result from neurotoxic chemical exposure.

Symptoms of neurotoxicity include memory and concentration problems; confusion; multiple sclerosis or MS-type symptoms; impaired control of the limbs, bladder, or bowels; headaches or migraines; sleep disorders, including sleep apnea; eye problems that are neurological in origin; balance and hearing problems; muscle weakness; anxiety or panic attacks; depression; and other psychiatric or neurological symptoms. (Any of this sound familiar to you Nam fellows?)

Other symptoms that could be caused by chemical injury include multi-organ system malfunction; lower or upper respiratory problems, such as chronic sinus problems; multiple chemical sensitivity (MCS); liver or kidney problems; and fibromyalgia or other pain disorders.

Along with nervous system dysfunction, the temporal association of any of these conditions with toxic chemical exposure tends to support the theory that the overall cause of the client's injuries is a toxic insult to the body.

The illness you probably need to know the most about is MCS, both because it is common among chemical injury patients, and because doctors often don't recognize it in their patients. The MCS diagnosis is still rejected by many doctors in part, because it is difficult to quantify objectively—but then, so are headaches.

Many doctors are not aware of the significant research that shows MCS is common and quite real. MCS is similar to other disabling illnesses. People who have it can become very ill from exposures to everyday chemicals, such as perfumes, paint, pesticides, and cleaning products.

Under some conditions, MCS is recognized as a potentially disabling condition by the Social Security Administration, the U.S. Department of Housing and Urban Development, and the Americans with Disabilities Act.

Documenting a chemical injury

There are various ways you can document the presence and course of a neurotoxic injury. All of them will help you build your case.

Conduct a neuropsychological evaluation. This procedure reveals both the most detailed view and the most subtle problems of the working brain.

A forensic neuropsychological evaluation usually includes a full battery of tests that can take up to 12 hours to complete. It can assess brain function, including memory; concentration; the ability to learn new information; executive function (the ability to plan, manage, and carry out a plan); perceptual functions, such as spatial awareness; motor functions, such as dexterity; and personality, emotion, and motivation. This evaluation can often detect whether changes have occurred that may be a result of toxic injury.

Be aware that some neuropsychologists consider someone impaired only if his or her cognitive functioning is well below average. Such an approach is inadequate when the person was once high functioning.

For example, a client with a superior IQ—such as a doctor or scientist—who now is unable to do his or her job will not benefit from an evaluation that interprets an "average" level of intelligence as "normal." Alternatively, your client may be someone who previously functioned at an average level but now is considered below average or has more marked problems in particular areas of brain function, such as emotion, personality, or executive function. These individuals benefit from more complex and subtle evaluations.

Several red flags can signal that the brain is not working as well as it should. For example, if a

client's vocabulary skills are high but his or her ability to process new information is at the 50th percentile, this discrepancy suggests a decline in information-processing skills. If the client was previously a successful engineer, a neuropsychological evaluation will give you findings that point to a decline in brain function.

Assess personality and emotional function. Chemically injured people can suffer personality changes induced by brain damage. The neuropsychologist needs to take a thorough history and conduct a record review to determine whether any personality disorders were preexisting or caused (or exacerbated) by the chemical injury.

The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is often used to assess personality. However, this instrument was not standardized on brain-injured people or those with neurological disorders, so the results must be interpreted carefully.

For example, if a "normal" person showed many neurological symptoms, he or she might correctly be characterized as mentally ill. However, it would be normal for a chemically injured person to report an array of neurological symptoms.

The patient with "too many" symptoms can get a diagnosis of "somatic disorder"—that is, having physical symptoms caused by psychological conditions. This misdiagnosis says that psychological problems are the underlying cause of the illness.

Neurotoxicity patients may well have psychological problems, but these are often the result, not the cause, of their condition. The true cause—organic (physical) brain dysfunction, or neurotoxicity—is too easily overlooked. When interpreting the MMPI-2, the expert must consider the person's medical and neurological conditions before reaching conclusions.

Also, some common interpretations of the MMPI-2 might over-diagnose malingering. An improper diagnosis of malingering can make it difficult to prove an injury.

It is not unusual for patients suffering from neurotoxicity to be misdiagnosed as having psychological problems because of their depression and anxiety levels, the sheer number of their symptoms, and their belief that chemicals made them ill. To minimize this error, choose among the most qualified experts you can find: Psychologists, neuropsychologists, or psychiatrists who are familiar with chemical injury, neurotoxicity, and MCS.

"Image" the brain."

It would be ideal to have an X-ray that would show what's gone wrong in the chemically injured brain. Unfortunately, brain scans are usually not helpful, because we don't have the technology

to "take a picture" of most brain injuries. (Even damage caused by traumatic brain injuries, such as from an automobile accident, may not show up in brain imaging.) A weak correlation exists between neuroimaging findings and neurocognitive outcome. Neurotoxic damage does not necessarily affect brain structure at the level we can see on a brain scan.

PET and SPECT scans are often more sensitive to brain injury than either MRIs or CT scans, but even if they show an abnormality, they don't show what caused it. Such scans have limited utility in court as proof of damage. The meaning of the abnormality still needs to be explained via neuropsychological assessment. A brain MRI often can be useful to rule out the possibility of another brain disorder.

Test the body. Searching for physical evidence of a chemical injury has been compared to searching for a bullet shot through someone's body: The bullet may be gone, but the havoc it wreaked is still there. Blood and urine can be tested for residue of the chemical in question and its breakdown products, or for a range of chemicals, but usually this testing is effective only while the client is still being exposed or after recent exposure.

The body may store toxicants in the fat and tissues, longer-lasting storage sites than the blood or urine. Tissue samples can be taken and occasionally are helpful, but these procedures can be difficult, painful, and expensive. Hair analysis may be helpful, but it is often controversial. Immunological testing can determine whether the client has elevated antibodies to some molds, suggesting high levels of exposure to toxic mold.

Test and analyze the exposure location. When analyzing an exposure location for toxic substances (such as might be found in the air or on surfaces), it is better to hire your own consultants to perform the work. (I think the soil and environment testing that has gone on for 40 years should be enough. And the results are objective not subjective.) They can control many important variables that could be ignored by other service providers.

Earlier tests conducted by the defendant may be available, but the results might not be valid for various reasons, even if the tests were conducted by a government agency. A potential defendant, after discovering that its site would be tested, may have aired out the building and washed down all the surfaces before testing. Unfortunately, the tests that government agencies perform are often woefully inadequate.

Analyze the site carefully. Is there adequate ventilation? Is there a clean-air exchange? Is the ventilation system blowing contaminated air into the client's breathing space?

Some toxic chemicals may be heavier than air, so ventilation in those circumstances should exhaust air out of the room from the level of the floor, not the ceiling. One of our clients suffered

severe brain damage after using solvents outdoors on his boat. Most people think that applying solvents outside is safe. However, our client applied them while lying on his back, under the boat. Because the solvent was heavier than air, this amounted to lying in a dense cloud of neurotoxic gas, and friends had to pull him out from under his boat. The toxic exposure caused injuries that rendered him completely disabled[15].

Under Daubert v. Merrell Dow Pharmaceuticals, Inc., the expert should present published research showing that the chemical implicated in the case has caused the same damage that your client suffered. However, there is room for some flexibility.

For example, in a 2001 federal toxic-tort case, the court admitted testimony that experts do not always need extensive, specific research on a particular product to arrive at an opinion. Instead, the chemical's toxicity can be deduced from general toxicology and basic logic: The substance was an organic solvent; organic solvents are neurotoxic; therefore, this solvent is neurotoxic.

In our experience, neuropsychological testimony is routinely admitted under Daubert rules. Its application to neurotoxicology is well established but may be challenged. We are not aware of cases where this testimony has been excluded on Daubert grounds, but individual states' requirements will vary.

In one case, the Ohio Supreme Court unanimously ruled that a witness who is not a physician, but who qualifies as an expert under state evidence rules, may give evidence that would be relevant to diagnosis of a medical condition if the testimony is within the expertise of the witness.

Usually, the statute of limitations does not start running until the client has received a diagnosis stating that his or her condition was caused by a chemical exposure. In many cases, it takes years for this diagnosis to be made.

In other situations, the client is so seriously injured that he or she cannot seek out appropriate medical or legal help. The very symptoms of neurotoxicity—memory problems, inability to concentrate or think clearly, and difficulty processing information—impede the injured person's ability to understand what happened to him or her and can decrease his or her intellectual and emotional capacity to pursue litigation. In such cases, you may need to file a statement of mental incompetence to extend the statute of limitations.

What to expect from the defense

Invariably, the defense will seek to minimize the link between your client's symptoms and the toxic substance he or she was exposed to and will try to play down the product's harmfulness. Expect arguments like these:

"This product cannot damage your health." The Material Safety Data Sheet (MSDS), required by law of every manufacturer, is a good place to start when seeking documentation of a chemical's adverse health effects, because often the MSDS lists them. However, sometimes the MSDS doesn't even hint at a product's real dangers, and you will need to conduct further research. The neurotoxicity of common products is discussed in various texts.

"If this product caused ill health effects, it would not be marketable." In fact, hundreds of neurotoxic products are promoted and sold. More than 850 industrial and commercial chemicals are known to cause neurobehavioral disorders.

"Ninety-five percent of the ingredients are inert, so what's the problem?" There are two issues here. One is whether 5 percent of an active ingredient is toxic enough to cause health effects—and often it is, because toxic substances can be harmful in small amounts.

The other issue is the meaning of "inert." So-called inert ingredients can be more toxic than the "active" ones. By labeling an ingredient "inert," a company may be trying to avoid admitting that there is a noxious ingredient in its product. The manufacturer may call its formulation a "trade secret." (Can you spell Picloram?)

Try to obtain a list of the inert ingredients by subpoena and have a laboratory analyze the product. Once you establish what the inert ingredients are, your consultants should assess their toxicity.

"But we didn't exceed government standards for exposure." "Safe" levels of exposure are a compromise between an industry's commercial needs and consumer protection and do not guarantee that an injury cannot occur. These standards generally become stricter with every passing decade, and incidents of reported chemical injury are what cause them to change. (Yea, like the Vietnam Experience called "Lessons Learned" the hard way)

(I doubt very seriously if the chemical folks put in writing an application note to the DOD to up the dose rate "until the desired effect is achieved." And/Or use alternating chemicals (synergy) "until the desired effect is achieved." Six to twenty- five times or more of the recommend dosage rate certainly was a product of the DOD, not the chemical company. 37 years after we left the soil samples by Hatfield Corporation still demonstrate a level 10 times what is considered safe and even that safe level is now questionable as there is no safe level. I think we got enough that would exceeded any "Safe Levels" The concentrations in I Corps had to be incredible for many reasons.)

Furthermore, safe levels are routinely set to protect a healthy male worker. However, some people are more susceptible than others. Women, for instance, tend to be more sensitive than men, and different bodies react differently to toxins. Variations in sensitivity are even observable

in rats. In addition, there may be no safe level at which a person can inhale a particular substance.

The MSDS typically will state that if a person shows signs of illness, you must remove him or her from the area immediately. This suggests that it is generally recognized that some people will become ill even when they are working under the recommended safe-exposure guidelines.

"This amount was far too small to damage anyone's health." Chronic exposure to low levels of some toxic chemicals can be even worse than a single acute exposure, because brain damage is cumulative over time.

"The plaintiff had preexisting conditions." Plaintiffs in these cases often do. It makes sense that people whose health is already compromised are the most vulnerable to poisons, because their bodies' detoxification systems—especially the liver and kidneys—are already stressed. People with a preexisting condition suffer further deterioration of their health. Your expert should document the preexisting condition thoroughly—this may require extensive review and analysis of the medical record—and document what new symptoms emerged and what preexisting symptoms became worse.

"Just smelling the chemical could not have caused this." Actually, inhalation and skin contact are often more effective routes of entry for a poison than swallowing. When something is swallowed, it is partly neutralized by stomach acids. The body then attempts to detoxify it through the liver, kidneys, and other organs. However, inhalation and skin contact allow a substance to enter the bloodstream directly, without any filtering. For example, doctors now use skin patches to administer morphine and birth control. And sniffing glue (solvents) can produce an instantaneous high and cause immediate and permanent brain damage.

"A neurologist found nothing wrong." Few neurologists have training in toxicology, and they rarely recognize the symptoms of neurotoxicity. A patient who suggests his or her symptoms were caused by a chemical exposure may encounter a brick wall of denial, bordering on hostility. (Sounds like VA/VACEH/IOM)

Some neurologists won't pay attention unless a patient's symptoms are extreme: For example, the patient cannot tell what day it is or walk in a straight line. Even then, the neurologist may misdiagnose the patient as normal, even if neuropsychological testing shows serious functional deficits. Still, a neurologist's exam may help rule out non-toxicological causes of a neurological illness or document certain physical signs, such as seizures or gait disturbances.

"Chronic pain is not a symptom of brain or nerve damage." The term "chronic pain" may seem vague, outside the realm of most doctors, and potentially confusing to a jury. However, chronic

pain can certainly be a symptom of brain damage and toxic exposure.

Damage to the brain and nerves can disrupt the nerve signals themselves or the way the brain interprets those signals. Resulting sensations can be tingling, burning, or debilitating pain, which one of my chronic pain patients described as "like a thousand razor blades." (Sound familiar to any of you Nam Vets.) Chronic pain can be a terrible ordeal and may require strong painkillers whose side effects could cause more damage.

"It is ludicrous to believe that neurotoxic chemicals can cause such disparate symptoms as insomnia, chronic fatigue, and gastrointestinal problems." (Sound familiar to any of you Nam Vets.)

On the contrary, the brain and nervous system control all bodily functions. The autonomic nervous system controls the involuntary part of bodily processes, including digestion, blood circulation, and the "fight or flight" response. (The ANS controls much more than this and after Branson I will be putting a paper on the ANS as it applies to many of our symptoms. About three to four weeks from now. We know that the immune/endocrine systems "both" interact with the ANS functions that are actually the directors of responses when given the commands. We know that these dioxins are not only tumor promoters but also potent dysregulators in both immune/endocrine systems. The question becomes...is it the brain assessing function damaged or the neurological sensors or both.)

It would be eye opening, I am sure, to have data on how many young boys that prior to Nam could eat in the mess halls and eat anything they wanted… up to and including almost pure grease with a gallon of cold milk as chaser with no gastro problems and not so much as a single burp. Then in returning home from Nam, as young men, found they could no longer eat heavy meats, or any greasy food, or even drink milk with out it becoming a fast acting laxative. Food they had grown up with they would find they could no longer tolerate without a price being paid. With upper gas, so bad you could light up a city block. Then diagnosed with a generic IBS, which means medicine, does not what is causing the multi-symptom scenario, so it becomes a syndrome of symptoms.

Major universities did not have studies on why so many were coming home with gastro problems for only four soldiers that were having problems. Of course, at this time, neurotoxic chemicals were not in the equation due to DoD/VA denials and distancing themselves from the many issues returning young men from war were having and reporting.

Another point I would suggest would be even more associated and highly relevant; how many of those young men that come home with gastro problems eventually developed peripheral nerve disease. Peripheral Nerve Disease of which some studies have concluded is the most prevalent disorder associated to dioxin in Nam Vets than any other single disorder, with or without diabetes.

Significantly associated not only to dioxin but also the difference between Veterans who served in Nam and those who did not serve in Vietnam with Odds Ratios in the development time snapshot for the studies of the persistent development of > 2.7. To conclude then that the Autonomic Nervous System is immune from these findings would be nothing short of total hypocrisy.

As most American Veterans already know, the list of associated disorders advertised by our Veterans Affairs is controlled by government; not the facts. We all know the advertised association to acute and subacute peripheral neuropathy is nothing short of a lie by Veterans Affairs with the time limits that this federal agency put on the manifestation and the time limit of resolution.

Let me point out that my counter part in New Zealand just informed me last night that New Zealand is already compensating for dioxin associated Hypertension as well as AL – Amyloidosis. Many of you may remember my postings on challenging that our guys and gals should be covered as associated to this runaway protein disorder which are deposited in organs and tissues and while more prevalent in certain organs can effect any organ causing organ and tissue failures. Certainly is associated to kidney failures.

He also informs me they have no time limit for any of their disorders including acute and subacute peripheral neuropathy

I hope to have that .pdf posted in a few days also including he informs me that the entire New Zealand Government is going to apologize to the their Nam Vets for their years of failures in not recognizing these disorders associated to their wartime service. Do not expect the same from our government... enough of us have not died yet. As historical facts found in prior government created Veterans Issues have clearly demonstrated.

I also hope to have composite posting by Dr. Cate Jenkins on the many neurotoxic issues that were found in Nam Vets and chemical workers in the next few days, if not then after I return. It is an eye opener.

While I still disagree, at this point anyway, that only light chain (AL) Amyloidosis is the only primary protein disorder associated. This is in the same realm as “only a few specific cancer sites are associated”; primarily because of cost not that the association does not exist in both studies as well as the underlying cellular dysregulations.

The question then becomes in subclinical Amyloidosis is it associated to the RA factors in our guys as well as Ankylosing Spondylitis. Just in a cursory review, it seems logical. Ankylosing Spondylitis also would correspond to what was found in Ranch Hand in painful neck movements; plus other painful joints with weakened tendons, spine degeneration, etc. This seems to involve in many issues, which would explain a lot of symptoms in Nam Vets both reported and found in studies. But

for another time in possibly associating this protein issue to what was and is being found.

The primary question I would have in just reviewing a partial list of issues that are associated to this what can be subclinical condition is the effect on the pancreas islets. Could this be one of the reasons we have insulin response and increased insulin resistance cellular issues? I think all of this comes down to what came first…the chicken or the egg scenario. Do the Veterans and Widows care what came first? I doubt it. This is just an employment game to some folks.

Do we have subclinical Amyloidal protein issues > Ankylosing Spondylitis > maturating to many outcomes and severity of outcomes such as the study found in Vietnam Veterans association to Radiculopathy at OR = 3.98 with a p-value found to exposure status at p = <0.001. Seems there is little doubt in these findings as to increased risk and association to the dioxin, TCDD.

In fact, do we not have a man made toxic isomer that is mimicking exposures to Epstein- Barr virus for instance, as an example, associated to the list below; yet, exposures were decades prior to multiple manifestation outcomes of symptoms and multiple levels of severity? Which by the way no one in medicine or science has questioned how much virus or the method of exposures or the lag time to manifestations, which can be any length of time when it relates to a virus, any virus. Rather than associating what is known regarding dioxins, dioxin like furan isomers, and what science concludes in PCB isomers that are similar to dioxins in construction; and the internal damaging process and then relate that to outcomes which no different than a virus will be multiple as well as in levels of severity. Our government and government contracted scientists for Veterans seems to be mandating specific dose related outcomes versus individual ICD code outcomes as if dioxins were a toxic poison, rather than a non-antigenic toxic isomer similar indeed to a virus in outcomes.

Some EBV related

Various cancers

B and T cell lymphomas both Hodgkin’s and Non-Hodgkin’s

Multiple Scleroses or MS

Human tumor virus

IL-10 promoter

Il-04 dysregulator

IFN – gamma dysregulator

Sarcomas

Lupus like syndromes and possibly other connective tissue disorders

Clinical disease activity

Epstein Barr associated Hepatitis

Gastrointestinal manifestations

Hepatocellular carcinoma

Induced gene deficiency

Confusion of th1 versus th2 Immuno system responses

Parkinson like syndromes

EBV Transformed B cells possibly associated with Alzheimer's.

Chronic Fatigue Syndrome CDS

Recognize any of those from above our infamous AO list or what should be on our list?

I will be working after I get back from Branson on this very issue as to how far does the association have to go and to what level, on a recommendation to the Veterans Affairs Committees that once and for all should put this level of association used against all Veteran Issues including Gulf War in the public arena and clearly defined and transparent. It certainly is not defined at present and seems to be more subjective than evidentiary. Veterans cannot fight an undefined level of association that seems to be at the whim of the Department of Veterans Affairs than the facts. Remembering at some point on these issues the Veteran is supposed to get the benefit of the doubt as a congressional requirement to VA.

One only has to look at the EPA "biochemical effects" of the single dioxin isomer versus the "human toxic outcome creations" to realize the little, and I mean very little, associations that are real and have not been pronounced associated. Including what is being discussed in the article Neurotoxicity just being one of many.

I wonder if Dr. Birnbaum or any other scientist, maybe Dr. Schector, has indeed compared these

known biochemical effect outcomes to the virus mediated outcomes (like in immunotoxicity) and the similarity at cellular and protein level of the human biological processes. Effects of both in toxic metabolizing, cytokines, modulation of receptors, etc for instance. If the process is similar, then how can we not have at least the disorders associated to that similar/like damaging process a virus can create with all the known characterizations that go with that same damaging process be it virus immune mediated or toxic chemical immune mediated.

We do no have to know the exact starting point or genesis of the damaging process. Although, I think Dr. Birnbaum is on the correct track in the detox enzymes from the liver at least that is how I understand it, not being the sharpest tack and all that. Testing levels at one to two levels above that will certainly suffice to show many associations, given similar biochemical comparisons and outcomes.

Back to the lawyers reasoning as to not only medical issues but legal issues.

“Multiple chemical sensitivity does not exist.” Studies indicate that almost 16 percent of the U.S. population report having unusual reactions to common chemicals. About 6.3 percent have been diagnosed with MCS or declared disabled from it. There is considerable research on, and international recognition of, this condition.