

# LDA and the US Army

The first portion of this article first appeared in Tiny Tick Tales published by the Lyme Disease Association of New Jersey (LDANJ), now Lyme Disease Association. The second article appeared in the Lyme Times. Updates follow each piece. This entire article appeared in the Time for Lyme Newsletter.

**May 1999**

**THE LDANJ VISITS THE US ARMY CENTERS FOR HEALTH PROMOTION & PREVENTION, CHPPM by: Pat Smith, with input from Corey Lakin and USACHPPM**

In May 1999, Association Vice President Corey Lakin and I visited the US Army Centers for Health Promotion and Prevention, USACHPPM, at Aberdeen Proving Grounds, Maryland. USACHPPM is the preventive medicine arm of the US Army. The visit was coordinated by NJ Congressman Christopher Smith's office as a briefing for us so that CHPPM could share the progress the Army is making in the area of tick-borne diseases, TBD. This year, CHPPM was required to submit an annual report to Congress, which is titled DoD Research and Surveillance Activities Regarding Lyme Disease and Other Tick-Borne Diseases, since Congressman Smith and Senator Dodd were able to get an attachment for TBD monies to the Strom Thurman National Defense Authorization Act for Fiscal year 1999. Congressman Smith was also successful several years ago in attaching Lyme disease monies to the defense appropriations.

Not really knowing the extent of Army involvement, we were surprised to find that the Army takes TBD very seriously. We were shown laminated tick cards designed especially for the Balkan theater where Lyme is transmitted through infected sheep ticks. We were given tick removal kits that are distributed to the Department of Defense (DoD) health clinics, so that ticks removed from soldiers can be submitted to USACHPPM for identification and testing. The DoD has a 3 prong Insect repellent system which they heavily promote: permethrin on uniform, DEET on exposed skin, and properly worn uniform = maximum protection. The DoD has developed a permethrin impregnation kit that soldiers can use to treat their

uniforms. The treatment offers protection for the life of the uniforms. We were also amazed to find the DoD has now made available uniforms that are actually impregnated with permethrin at time of manufacture, so that applications do not need to be done by the soldiers. They also use a state-of-the-art, long-acting DEET skin cream that is commercially only available through Amway.

The most exciting research was being done in the area of technology. In the lab, we saw how the Army has developed a prototype "in the field" PCR test kit, a virtual lab in a suitcase, to be able to perform testing for the presence of *Borrelia burgdorferi* right where the action is. It has been designed so that soldiers with limited training can operate it successfully. Individuals utilizing these kits could amass tick data including species, density, location (using a Graphic Information System, GIS), and results of PCR testing, which are then transmitted directly from the field to computers via a portable satellite uplink.

The development of a "heads up" display for tick populations is certainly some of the best use of technology in tick prevention that I have ever seen. If you are not familiar with this terminology, you are not alone. A soldier in the field wears a special helmet with a special "heads up display" visor. The soldier is also equipped with a Global Positioning System (GPS) receiver, which is able to pinpoint his/her exact location on earth, and also a small transceiver linked via satellite to the DoD's GIS computer. The GIS computer tracks the soldier's position and transmits critical information, including tick population densities, to the "heads up" display visor. This high tech system provides soldiers in the field with a real time assessment of the risks posed by ticks in the potential troop deployment area and offers guidance during maneuvers, so that if possible, personnel shifts can be made to avoid dense tick populations.

The mapping of tick populations has already started and the density overlays are reported to a military map. The map overlay image is transmitted via secure satellite links to whomever requests it. On the example shown to us, the graphic shows the "risk of infection with Lyme disease from ticks occupying this area" from 0% to 100%. Additionally, tick infection rates are being determined at all major military

installations and this data is being used to create overlays and analyze tick densities to protect those who are employed at these installations. This feat is accomplished by coupling GIS to field collected data.

The CHPPM officials were extremely cooperative. We had discussions on how these army developments can benefit the civilian population, and more importantly, how can this information be relayed to the civilian sector in a timely basis? We felt that this visit would be a first step in "opening up" communications. We, of course, can both benefit by us helping to promote monies in the Defense Authorization Act, as we have already done through Congressman Smith, and us ensuring that they receive monies through the Lyme Disease Initiative 1999 (current DoD appropriation in bill-\$30M/5years). I have had preliminary discussions with Congressman Smith's office about the possibility of inserting language into the LD Initiative that would require DoD tick-borne illness projects to be made public within a specified time period after their development. It is too early to determine if this is a viable proposal.

Space limitations prevent me from printing the Report to Congress here, but I have selected several paragraphs that I feel reflect the tone of the report. The first three paragraphs of Section I of the report state: FINDINGS: Ticks are among the most important of all arthropod vectors of disease. There are over 850 recognized species worldwide. Ticks rank second only to mosquitoes in the number of life-threatening and debilitating diseases they transmit to humans. In the United States, ticks are responsible for more human disease than any other arthropod group. Tick-borne diseases represent potentially serious health threats to troops, their family members, DoD civilian employees, and other residents at military installations in many parts of the world.

In recent years, data indicate that tick-borne disease transmission has been increasing in the United States, both in terms of incidence of some diseases and the number of known pathogens transmitted by ticks. Tick-borne pathogens appear to be in the vanguard of a group of newly emerging diseases. Since 1957, at least 14 new disease agents have been discovered worldwide. Ticks transmit four of these, or almost 30%. They cause Lyme disease, human monocytic ehrlichiosis, human granulocytic ehrlichiosis, and human babesiosis. Deaths have been associated with some of these. To

further complicate matters, there is increasing evidence that individual ticks can carry and transmit two or more infectious agents simultaneously, thereby increasing the severity and complexity of symptoms, and compounding the difficulty of diagnosis and treatment.

Lyme disease is now the most prevalent vector-borne disease in the United States, with approximately 100,000 cases reported to the Centers for Disease Control and Prevention (CDC) since it became a nationally reportable disease in 1991. It is estimated that the actual number of cases may be as high as one million or more...

I have always been an individual with a lot of questions, but this report has raised many more in my mind. Why are Lyme and other TBD's seriously considered threats to the troops who defend our country, yet not seriously considered threats to the civilian population? Why are military installations mapped and rated for tick densities and rates of infection, while public parks are not even posted with warning signs? Why would PCR's be reliable "in the field" and not at commercial labs? Why is the government impregnating uniforms with permethrin, when we all know that the civilian population is creating a climate of "Lyme hysteria" and that Lyme is "overdiagnosed and overtreated?" To quote the report: "In addition to directly transmitting disease, the adverse impact of psychological factors associated with tick attack, including fear, discomfort, and distraction, as well as indirect medical complications such as secondary infections, dermatitis or allergic reactions, should not be overlooked." The army has not labeled this "hysteria" but normal "complications" of tick attacks.

Why is the vaccine promoted to the civilian population yet the report states "...questions and concerns linger regarding the new vaccines safety...; effectiveness...; age restrictions...; frequency of boosters...; and the known limitation that it is ineffective against European strains of the Lyme disease agent. Confident decisions as to its value and use within the military cannot yet be made..." Why does this double standard exist? I do not have all the answers, but I think we need to work more closely with government and the military to get all the answers so that we can solve this enigma that has been called Lyme disease.

**UPDATE 2001:** Since this article was written, the LDA has had further communications with CHPPM. They sent a speaker to the LDA 2001 medical conference in Princeton entitled Lyme & Other Tick-borne Diseases: A 21st Century View. Dr Anthony Gutierrez discussed the Army's work with tick populations in a lecture titled Real Time Field Surveillance of Vector-born Disease pathogens (can be found on LDA videotape of the conference).

Although it is not technically military, LDA at the same conference featured a speaker from NASA, describing the joint NASA/ NIH 3-dimensional culturing project for *Borrelia burgdorferi* using microgravity chambers, which mimic conditions in space and in the human body. Researchers are culturing a number of organisms in this manner and getting a truer picture of how the diseases act in the body. Conventional culturing in the lab is two-dimensional (growing on a flat medium), whereas the bacteria exist in a three-dimensional environment in the body. Scientists can study how the real life setup (3-D) enhances bacteria's ability to communicate with one another causing much more damage than might be expected from looking at them in the two-dimensional state. Perhaps the enhanced communication holds the secret to their persistence in the body, but that is purely speculative on my part.

### **September 2002**

**At the behest of the Lyme Disease Association, Congressman Christopher Smith hosted a meeting in Washington, DC, with military leaders to discuss the issues surrounding Lyme disease.**

In recent years, I have been contacted by a number of military families who were having difficulty obtaining treatment for Lyme disease. As complaints mounted, I became disturbed by their nature. The LDA had after all, visited Aberdeen Proving Grounds the home of US Army CHPPM several years ago and saw cutting edge technology being used to develop methods to prevent tick exposure and to permit immediate field-testing (PCR) of ticks so soldiers could be treated on the spot if necessary after an infected tick bite. Now I was hearing that military personnel were being "mustered out" of the service rather than being treated for the disease.

Someone needed to address this dichotomy in viewpoints.

The LDA took Doctors Burrascano, Fallon, and Liegner and flew in a military spouse, C.N., to address the meeting. I made an opening general presentation, Dr. Fallon discussed the neuropsychiatric aspects of the disease, Dr. Burrascano presented persisting infection, and Dr. Liegner talked about the similarities between LD and syphilis and made case presentations. CN discussed her difficulties as an Air Force spouse in obtaining treatment and in being taken seriously. I then presented the officials with a stack of complaints CN and I had collected from military families.

About a dozen officers from the army, navy and air force plus Congressman Smith and his staff attended the meeting. Unfortunately, the Congressman himself was called away for a vote during the presentations, and later confided to me that he was disturbed that he was not able to hear the entire discussion. The military were attentive, and although at the conclusion, questions and comments were slow in coming, eventually, these officials acknowledged that they too experienced some of the same types of problems that we have with the disease out here in civilian land. Some indicated they would contact us in the future after reviewing materials.

Doctors within the Army and Navy have subsequently contacted us and LDA has sent some materials. A few discussions have ensued, some with our doctors. The door has been open a crack and we do not intend to let it be slammed closed ever again. It is important that we work together with all officials who are willing to be open-minded and listen to the plight of Lyme victims.

**UPDATE 2002:** The LDA has also been communicating with a general (ret.) in Rhode Island, Brigadier General Amedeo C. Merolla who has experienced the ravages of Lyme disease in the military and civilian population. He wrote a letter to the LDA expressing his concern. The LDA sent it in a packet to Army officials after the DC meeting. It was also published in the Time for Lyme, New York program.

The Adjutant General of Rhode Island, Gen. Reginald A. Centracchio, also has written to the LDA expressing grave concerns about Lyme disease in

Rhode Island, "There are universal concerns regarding diagnosis and treatment problems of long-term Lyme disease, which affect our military and civilian populations." This letter was also forwarded to the army officials with whom we met. Obviously, the problem has grown too large to continue to be ignored.