

## **Congressionally-Directed Medical Research Programs (CDMRPs)**

### **Relevance to National Security and Military Families**

- **ALS**: According to studies by the DOD, VA, NIH and Harvard University, people who have served in the military are approximately twice as likely to develop ALS as the general population. The VA has recognized the connection between ALS and military service by establishing a presumption of service connection for ALS. The VA presumes that ALS was incurred in or aggravated by service in the military. Moreover, the presumption applies to any veteran who served, from any branch of the military, regardless of where or when a veteran served (home or abroad, during a time of peace or conflict) and regardless of when they were diagnosed with the disease following discharge (eg, 1 year after service or 50 years).
- **Autism**: According to the Centers for Disease Control and Prevention, 1 in 110 children have an autism spectrum disorder (ASD). In 2008, the Department of Defense reported that 10,727 military dependents had a diagnosis of ASD. These families are affected substantially by the financial and emotional costs of raising a child with autism and this impact extends to the performance and readiness of service members and their units. It is well known that children with autism, if they receive prompt treatment and early intervention services, can improve their long-term functional prospects dramatically. Additional research will help to improve treatment and intervention directly serving the interests of DoD families touched by autism as well as the medical, educational, healthcare and service professionals who serve the needs of the autism community within and beyond DoD.
- **Bone Marrow Failure Disease (BMFD)**: Recent data indicate that members of the armed services who were deployed to Iraq or Afghanistan may have been exposed to environmental factors associated with aplastic anemia, MDS and other bone marrow failure diseases. By studying Armed Forces personnel who have been diagnosed with these conditions, the BMFD program at DoD is helping us gain a much better understanding not only of what causes bone marrow failure diseases, but also of how to protect our troops—and the general public—in the future.
- **Brain Tumors** – Research funded by the Peer Review Cancer Research Program is funding research on complex immunotherapy treatment called adoptive cellular therapy that is focusing on brain tumors. By focusing on brain tumors researchers aim to help military families because the brain is the most frequent site of crippling injuries in humans and brain cancer is the second leading cause of cancer death in children under age 20. Approximately 210,000 people in the U.S. will be diagnosed with a primary or metastatic brain tumor this year, or about 575 per day. Of all cancers brain tumors have among the lowest survival rates and fewest medical breakthroughs over the past twenty years. However, research funded by the PRCRP is showing promise because it is focusing on the underlying genetics and microenvironment in which cancer grows and replicates. PRCRP provides a critical fast-track for research funding that is needed to advance medical research on behalf of military members, their families and all Americans.
- **Breast Cancer**: Active duty females are 20 to 40 percent more likely to develop breast cancer than the general population.

- **Colorectal Cancer:** In a study published in the June 2009 edition of *Cancer Epidemiology Biomarkers & Prevention*, researchers found that colorectal cancer was one of the most common forms of cancer among active-duty military personnel. Screening rates in the military for colorectal cancer, like in the general population, are much too low. In 2008, only about 58% of those in the military who should be screened for colorectal cancer had been screened.
- **Leukemia/Lymphoma/Multiple Myeloma:** Many of the blood cancers are linked to chemical and radiological exposures. Leukemia, lymphoma, Hodgkin's disease and multiple myeloma have all been linked to either ionizing radiation, Agent Orange, or both; Vietnam veterans who are diagnosed with non-Hodgkin's lymphoma are diagnosed significantly earlier than their non-Vietnam veteran counterpart and once diagnosed, they will experience approximately 30 percent shorter lives than their non-Vietnam veteran counterparts.
- **Lung Cancer:** Numerous studies over the years published by the Institute of Medicine, *Cancer*, *Military Medicine*, *Chest* and others have shown that lung cancer incidence and mortality rates, due to much higher smoking rates and exposures to known carcinogens during active duty, are an estimated 25% – 30% higher in the military than in civilian populations.
- **Lupus:** Emerging research data indicates that our U.S. servicemen and women may be at high risk for developing lupus and other autoimmune diseases. Factors such as post-traumatic stress disorder (PTSD), vaccines, chemical and toxins, ultraviolet light, certain drugs and infectious agents, have been associated with the development of lupus and other autoimmune diseases. Few studies have been initiated to examine these issues in depth. As the prototypical autoimmune disease, findings from a robust research effort on lupus may provide clues to the causes of many other autoimmune diseases. There is an urgent need to expand research to better understand the key factors that place military personnel at risk for developing lupus.
- **Melanoma:** A 2000 "Annals of Epidemiology" study comparing mortality among WWII veterans of the Pacific and European Theaters found that Pacific Theater Prisoner of War veterans had an estimated 3-fold higher risk of dying from melanoma than veterans of the European Theater, concluding that exposure to high levels of solar radiation in young adulthood is associated with a higher risk of melanoma mortality. Given this information, U.S. military personnel currently stationed in Iraq and Afghanistan, where the intensity of sun exposure is similar to that of the Pacific, have the potential for a long-term risk of melanoma. According to the American Academy of Dermatology, skin cancer is the most prevalent of all types of cancer and malignant melanoma is the most deadly of all skin cancers killing an estimated 8,000 Americans each year. Furthermore, the mortality rate of melanoma for persons ages 16-29 is exceeded only by breast cancer, cervical cancer and non-Hodgkin's Lymphoma and deaths from melanoma have increased more than 100 percent in the past 30 years for men ages 55-80.
- **Multiple Sclerosis:** A study in the *Annals of Neurology*, identified 5,345 cases of MS among U.S. veterans that were deemed "service-connected." The number of service-connected cases was a significant increase from previous studies.

- **Neurofibromatosis (NF)**: Wound healing requires new blood vessel growth and tissue inflammation. Mast cells are critical mediators of inflammation in wound healing, and they must be quelled and regulated in order to facilitate wound healing. In the past few years, NF researchers have gained deep knowledge on how mast cells promote tumor growth, and this research has led to ongoing clinical trials to block this signaling. The result is that tumors grow slower. As researchers learn more about blocking mast cell signals in NF, this research could be translated to the management of mast cells in wounds and wound healing.
- **Peer-Reviewed Orthopedic Research** - Eighty-two percent of injuries from the Global War on Terror involve the extremities – often severe and multiple injuries to the arms and legs. PRORP, funded through the Department of Defense Health Program, was established to quickly develop focused basic and clinical research through direct grants to research institutions. The goal is to help military surgeons address the leading burden of injury and loss of fitness for military duty by finding new limb-sparing techniques to save injured extremities, avoid amputations, and preserve and restore the function of injured extremities.
- **Prostate Cancer**: Active duty males are twice as likely to develop prostate cancer than their civilian counterparts. Research funded by the Prostate Cancer Research Program (PCRP) advances treatments and procedures for war fighters exposed to chemical weapons, who are at an increased risk of developing prostate cancer. These soldiers include those exposed to chemical agents such as Agent Orange in Vietnam; other unknown chemicals that have emerged since the Desert Storm operations in Iraq; and exposure to depleted uranium which has been used in munitions since 1991 and used in classified testing facilities since the 1970s.
- **Tuberous Sclerosis Complex (TSCR)**: Research supported by the TSCR is paving the way to finding cures and treatments for individuals with TSC as well as those with other neurological disorders like epilepsy and ASD. Research on epilepsy is of growing significance to the U.S. military, which is examining the links between traumatic brain injury and epilepsy. Since an estimated 80% to 90% of individuals with TSC will also experience seizures at some point in their lifetime, research may lead to the development of new medical interventions for the approximately 2.7 million Americans with epilepsy. The TSCR has funded studies that serve as gateways into gaining a better understanding of epilepsy, ASD, diabetes, cancer and other disorders that afflict service personnel and their families.