Breast Cancer: Active duty females have higher incidences of breast cancer; their risk is 20 to 40 percent higher than the general population. In 2008, 1/7 of active duty individuals were women, the majority of whom were under the age of 40. Tumors diagnosed in younger women are often more aggressive and less responsive to treatment. More than 10,000 U.S. women under 40 are expected to be diagnosed with breast cancer this year, and more than 1,100 will die.

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.

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.

Colorectal Cancer: According to a study published in the June 2009 issue of Cancer Epidemiology, Biomarkers & Prevention, researchers found that colorectal cancer was one of the most common forms of cancer among active duty military personnel. Yet, screening rates among military personnel for colorectal cancer remain low. As published in the 2009 Humana Military’s Clinical Quality Report Card, only 58 percent of those in the military were up to date with screening in 2008. The PRCRP has supported research into treatments for colorectal cancer, including research into treatments that would block the growth of metastatic colorectal cancer.

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 liked 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.
• **Tuberous Sclerosis Complex (TSCRP)**: Research supported by the TSCRP is paving the way to finding cures and treatments for individuals with TSC as well as those with other neurological disorders like epilepsy and autism spectral disorder (ASD). Research through a TSCRP grant developed a mouse model for TSC which, in addition to its use for studying epilepsy and autism, is helping shed light on the consequences and potential treatment for post-traumatic brain injury – a disorder of growing concern to the U.S. Armed Services.

• **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.

• **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).

• **Neurofibromatosis (NF)**: The Neurofibromatosis Research Program (NFRP) has benefited thousands of our warfighters, other military personnel, veterans, and their families. NF research is a critical part of the military mission, because it directly impacts the development of treatments for peripheral nerve regeneration after injury and brain trauma, and it also furthers the development of imaging platforms. In addition, NF research has enhanced our understanding of nerve cells, their degeneration, and nerve pain – results of which are being translated into clinical practice and treatment for a wide range of nerve and chronic pain conditions. Lastly, NF research facilitates a better understanding of wound healing, particularly vascular development and control of blood vessel growth, which is of great importance to our armed forces.

• **Peer-Reviewed Orthopaedic 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.
- **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.

- **Autism**: According to the Centers for Disease Control and Prevention, 1 in 110 children have an autism spectrum disorder (ASD). In 2011, the Department of Defense reported that 21,500 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 service members and DoD families impacted by autism as well as the medical, educational, healthcare and service professionals who serve the needs of the autism community within and beyond DoD.

- **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.

- **Osteoarthritis (OA)**: Current research suggests that stresses placed on joints during military training activities, increased rates of injury, and increased weight of military packs have led active duty soldiers and veterans to have twice the rate of Osteoarthritis (OA) when compared to non-military populations. In fact, OA is the leading cause of disability and medical discharge in active service members under the age of 40. Rheumatoid arthritis (RA) strikes at the peak one’s career (mid-late thirties/forties) and often leads to early retirement and disability. CDMRP research funding for OA and RA could help identify arthritis prior to the onset of symptoms. This research could help identify medical and physical interventions to prevent or minimize joint damage and slow or stop the arthritis disease process before joints are permanently damaged. Targeted research efforts would focus on examining genetic factors, ways to improve diagnosis, screening, and treatment options.