DEFENSE-RELATED VISION RESEARCH

DECADE OF VISION
2010-2020
an initiative of the
Alliance For Eye And Vision Research

House Approves FY2014 Defense Bill with $10 Million for Vision Trauma

On June 12, the House Appropriations Committee approved an FY2014 Defense Appropriations bill that includes VTRP funding at $10 million—the second year of funding at this level. The House has yet to announce full floor action on the bill. Although the Senate Appropriations Committee has not yet taken action on a bill, it is unlikely to have a VTRP line, as the Senate has traditionally included vision in a pool of funds within Defense Health Programs.

Although NAEVR has bipartisan support for the VTRP, four Democratic members of the House Defense Appropriations Subcommittee joined in urging VTRP funding at $10 million. In an April 14 letter, Congs. Jim Moran (D-VA), Marcy Kaptur (D-OH), Betty McCollum (D-MN) and Bill Owens (D-NY) urged Subcommittee Chair Cong. Bill Young (R-FL) and Ranking Democrat Cong. Peter Visclosky (D-IN) to support this funding level, using several talking points from NAEVR’s position paper. VTRP funding is not part of “core” DOD funding requested by the President and must be added each year by Congressional appropriators.

Cong. Moran has served as the program’s champion since he first requested dedicated funding in FY2009 Defense appropriations.

On March 19, AEVR’s Decade of Vision 2010-2020 Initiative hosted a Congressional briefing entitled Computational Model of the Eye for Primary Blast Injury featuring T. Vicky Nguyen, Ph.D. from the Department of Mechanical Engineering at Johns Hopkins University. Dr. Nguyen’s research is funded by the VTRP and addresses several DOD-identified vision research gaps—the immediate impact of blast injuries on ocular structures; the potential long-term impact on visual processing, such as visual dysfunction associated with Traumatic Brain Injury (TBI); and the need for better protective gear.

Dr. Nguyen explained that deployment-related military eye trauma is very different from the trauma associated with falls, vehicle accidents, and blunt force trauma. As a result, to adequately protect the eye in combat situations, the source of the trauma must be understood, which is the focus of her work.

She stated that, unlike past conflicts where ocular injuries resulted from exploding munitions, more than 70 percent of blast injuries in the conflicts in Iraq and Afghanistan have resulted from Improvised Explosive Devices (IEDs). Blasts are characterized as primary (shock wave), secondary (propelled fragments that cause corneal laceration, eye globe penetration and perforation), tertiary (blunt force trauma that causes closed globe injuries such as retinal detachment and optic nerve damage and orbital fractures), and quaternary (burns, toxins, radiological and biological contamination). Although most of these result in ocular damage that is immediately recognized, the distortion of ocular structures can result in the long-term development of optical dysfunction that may not be diagnosed until many years later.

Dr. Nguyen has developed an experimentally validated computational model of the human eye globe to investigate injury mechanisms of the primary blast wave. This includes determining the stresses and deformations of the eye-wall (the cornea, the lens at the front of the eye, and sclera) and internal ocular structures (such as the retina, the light-sensitive back of the eye, and the optic nerve), as well as investigating the interaction of orbital structures with the blast wave and the potential mitigating impact of standard eye armor.

In the computational model, blasts are directed head-on and from various angles sideways and upwards at a rigid face with all anatomical features, which can be varied to reflect gender or ethnicity. When blasts are directed head-on, the eye is a “hot spot” in that the brow and nose act as a deflector to move pressure onto the eye. The pressure is also asymmetric, focusing off-center toward the nose, raising the possibility of damage to the ocular muscles and even bone. Sideway blasts ranging in angles from 40 to 80 degrees result in similar injuries, while blasts directed upwards from the ground are less severe due to the protective nature of the chin and nose.

When the model is revised to reflect eye armor, the head-on blast initially focuses on the eye, then funnels around the armor toward the temple, not the nasal region. There is still a pressure increase on the eye, although less than without armor. This can occur especially when the armor is not properly fitted, enabling a gap at the bottom for “underwash” to affect the eye. “Although eye armor provides some degree of protection from the blast wave, it is not as effective as we think it is,” said Dr. Nguyen.

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Blinded Veterans Association Honors Cong. Jim Moran

On April 16, BVA presented to Cong. Jim Moran its Congressional Recognition Award in “grateful appreciation and recognition of your commitment to our nation’s blinded veterans and their families, for constant leadership on the defense Vision Trauma Research Program.”

BVA and NAEVR Honor Colonel Don Gagliano

On March 31, Colonel Donald Gagliano, M.D. retired as Director of the joint DOD/VA Vision Center of Excellence (VCE) after almost five years serving in that capacity, VCE Deputy Director Mary Lawrence, M.D., M.P.H. is currently serving as Acting Director.

In April, BVA honored Colonel Gagliano for his service. On May 5, the NAEVR Board of Directors adopted a resolution commending Colonel Gagliano’s service to the VCE, as well as his past concurrent service as co-Chair of the TATRC Program Committee that oversees the VTRP program and as a member of NEI’s National Advisory Eye Council.

Visit the Defense-related Vision Research section of NAEVR’s Web site for full details

DOD-Funded Researcher Studies Impact of Primary Blast Injuries

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