ISSUE SUMMARY

- The defense Vision Research Program (VRP) line item is the only dedicated funding source for extramural research into deployment-related vision trauma.
- For Fiscal Year (FY) 2019, Congress approved $20 million, which was a $5 million increase over the $15 million funding in each FY2017 and FY2018.
- This type of research is not being conducted elsewhere within the Department of Defense (DoD), including the joint DoD/VA Vision Center of Excellence (VCE), by the Department of Veterans Affairs (VA), or the National Eye Institute (NEI) within the National Institutes of Health (NIH).
- A January 2019 Military Medicine article, based on a 2018 update of a 2012 study conducted by the National Alliance for Eye and Vision Research (NAEVR), concluded that based on published data from 2000-2017, deployment-related eye injuries and blindness have cost the U.S. $41.5 billion, with $40.2 billion of that cost reflecting the present value of a lifetime of long-term benefits, lost wages, and family care.

Request: FY2020, the vision community is requesting VRP funding at $20 million. This request is based on need, as the DoD can only fund a fraction of the grants with both scientific merit and program relevance.

IMPACT ON SOLDIERS

- Vision, the sense most critical for optimal military performance in battlefield and support positions, is most vulnerable to acute and chronic injury.
- Treatment of acute eye injury determines the extent of vision impairment or resulting chronic eye disease and the associated need for vision rehabilitation.
- Traumatic eye injury from penetrating wounds and Traumatic Brain Injury (TBI)-related visual disorders rank second only to hearing loss as the most common injury among active military:
  - Traumatic eye injuries have accounted for upwards of 16 percent of all injuries in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF).
  - Male soldiers aged 20-24 years account for 97 percent of visual injuries.
  - Soldiers with eye injuries have only a 20 percent return-to-duty rate as compared to an 80 percent rate for soldiers with other battle trauma injuries.
  - The VA reports 197,000 OEF/OIF veterans with eye injuries since 2000, and that upwards of 75 percent of all TBI patients have short- or long-term visual disorders, including double vision, sensitivity to light, inability to read print and other cognitive impairments.
- Ground soldiers face numerous assaults that potentially impair visual function, including:
  - Eye injuries from chemical, biohazard, laser and environmental exposure.
  - Corneal (front-of-eye) and retinal (back-of-eye) injuries that are often not evaluated until a soldier’s vital signs are first assessed and which, if not stabilized, lead to vision loss.
Direct blast injuries, as well as potential long-term ocular injuries from the blast wave.

IMPACT OF VRP RESEARCH

• Since the VRP was created in FY 2009, the DoD has awarded 85 grants totaling $85 million to researchers addressing penetrating eye injuries, corneal healing, retinal/corneal protection, TBI-related visual dysfunction, the eye blast phenomenon and vision rehabilitation—all areas addressing DoD-identified research gaps.
• Researchers funded by the VRP have published 163 scientific papers to-date that are advancing knowledge about the diagnosis and treatment of eye trauma injuries.
• VRP-funded projects have also resulted in 15 patents or applications for patents.
• VRP funding has supported the development of the following:
  o A portable, hand-held device to analyze the pupil’s reaction to light, enabling rapid diagnosis of TBI-related visual dysfunction.
  o An “ocular patch,” which is a nanotechnology-derived reversible glue that seals lacerations and perforations of the eye on the battlefield, protecting it while a soldier is transported to a more robust medical facility where trained ocular surgeons can properly suture the globe.
  o A validated computational model of the human eye globe to investigate injury mechanisms of a primary blast wave from an Improvised Explosive Device (IED), which has accounted for 70 percent of the blast injuries in Iraq and Afghanistan. The model determines the stresses on and deformations to the eye globe and surrounding supporting structures to enable the DoD to develop more effective eye protection strategies.
  o A vision enhancement system that uses modern mobile computing and wireless technology, coupled with novel computer vision (that is, object recognition programs) and human-computer interfacing strategies, to assist visually impaired veterans undergoing vision rehabilitation to navigate, find objects of interest, and interact with people.

WHAT TO TELL CONGRESS

• Urge Congress to support funding the VRP at $20 million for FY 2020, which is the same level of funding as in FY2019.
• The VRP is the only dedicated funding source for extramural vision research into DoD-identified research gaps, which is not conducted by the VA, the joint DoD/VA Vision Center of Excellence or the NEI.
• VRP funding at $20 million is also supported by a majority of veteran service organizations and military service organizations, including the Blinded Veterans Association.