



# National Alliance for Eye and Vision Research

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Traumatic eye injury is one of the most common afflictions among active military. **James Jorkasky**, Executive Director of NAEVR, explains why defence-related vision trauma research funding is critical

**IN THE PAST** decade, vision trauma has been a signature injury of the conflicts in Iraq and Afghanistan, in addition to traumatic brain injury (TBI), which causes visual dysfunction, post traumatic stress disorder (PTSD) and loss of limbs. In the US, the National Alliance for Eye and Vision Research (NAEVR) advocates with Congress for adequate federal funding for the Vision Trauma Research Program (VTRP) that addresses these deployment-related eye injuries.

### THE IMPORTANCE OF VTRP

The dedicated VTRP budget line in annual Department of Defense (DOD) appropriations is allocated to extramural vision research into immediate battlefield needs that is not funded by the Department of Veterans Affairs (VA), elsewhere within the DOD (including the Joint DOD/VA Vision Center of Excellence, or VCE), the National Eye Institute (NEI) within the National Institutes of Health (NIH), or by private foundations. Although former US Secretary of Defense Robert Gates identified restoration of sight and eye care as a top priority for deployment-related health research funding, the DOD has not yet established adequate 'core' funding to address all vision research gaps, so VTRP funding is necessary.

Although the VTRP was established as a budget line in 2009 DOD appropriations, it is not permanent and the vision community must advocate with Congress each year for its inclusion. Although NAEVR has consistently requested \$10 million in VTRP funding each year since 2009, annual appropriations have ranged from \$3.25 million to \$5 million; this is despite the fact that vision is most critical for optimal military performance in battlefield and support positions, and is most vulnerable to acute and chronic injury. NAEVR emphasises that research to effectively treat acute eye damage can have long-term implications for an individual's vision health, productivity and quality of life for the remainder of military service

and into civilian life.

Traumatic eye injury from penetrating wounds and TBI-related visual disorders ranks second only to hearing loss as the most common injury among active military:

- Traumatic eye injuries have accounted for upwards of 16 per cent of all injuries in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF)
- Male soldiers aged 20-24 account for 97 per cent of visual injuries
- Eye-injured soldiers have only a 20 per cent return-to-duty rate as compared to an 80 per cent rate for other battle trauma injuries
- The VA estimates that 118,150 OEF and OIF veterans have been treated for eye injuries from October 2001–30 June, 2012
- The VA estimates that upwards of 75 per cent of all TBI patients experience short- or long-term visual disorders including double vision, sensitivity to light, inability to read print and other cognitive impairments

### COST OF MILITARY EYE INJURIES AND BLINDNESS IN THE US

In May 2012, NAEVR consulting economist Kevin Frick, PhD (Johns Hopkins Bloomberg School of Public Health) released results of a first-ever study of the costs associated with military eye injuries and blindness. The study, entitled *Costs of Military Eye Injury, Vision Impairment, and Related Blindness and Vision Dysfunction Associated with Traumatic Brain Injury without Eye Injury*, used only published data from 2000-10 and widely accepted economic conventions to characterise the incidence numbers and concomitant costs associated with eye injuries, which range from superficial to one- or two-eye (bilateral) blindness, as well as visual dysfunction associated with TBI. The total incident cost of eye injury each year has been \$2.282 billion, yielding a total cost to the economy over this timeframe of \$25.107 billion, reflecting:

- \$634 million in first-year costs
- \$188 million present value of long-term VA benefits
- \$24.286 billion in present value costs to the economy and society (social security benefits, lost wages, family care)

In announcing these results, Frick acknowledged study limitations, especially those related to the growing knowledge about the diagnosis and treatment of TBI visual dysfunction that could significantly increase those costs.

### VISION RESEARCH GAPS

Ground soldiers in particular 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 the result of direct blast injuries and are often not evaluated until a soldier's vital signs are first assessed and which, if not stabilised, lead to vision loss
- TBI-related visual dysfunction
- Potential long-term ocular injuries from a blast wave's pressure differential

Due to the full spectrum of eye injuries – from superficial to blinding – as well as the military's desire to prevent injuries and to rehabilitate soldiers with injuries, the DOD has identified at least nine vision research gaps:

#### Profile of a VTRP champion

Congressman James Moran (second right), a member of the House Defense Appropriations Subcommittee, championed the VTRP's creation in 2009 and remains an ardent supporter, stating: "If we are going to send our armed forces in harm's way, then we have an obligation to invest in the development of the best possible care and treatment". (*Military Times*, October 10, 2011). In this image, he is joined by staffer Chris Gaspar (second left) and NAEVR's David Epstein (left) and James Jorkasky (right).





Project Gemini, a joint initiative between Blinded Veterans Association in the US and Blind Veterans UK (formerly known as St Dunstan's), enables veterans who have recently lost their sight to meet to discuss rehabilitation, readjustment training and research. Each May, a group of blind US veterans travels to England to meet with blind UK veterans at Blind Veterans UK's Brighton facility, as well as to travel throughout the country and participate in special tours of historic sites. In May 2012, the group visited Moorfields Eye Hospital in London to hear the latest in eye trauma research.

1. Inadequate mitigation and treatment of traumatic injuries, war-related injuries and diseases to ocular structures and the visual system
2. Inadequate mitigation and treatment of visual dysfunction associated with TBI
3. Inadequate ocular and visual systems diagnostic capabilities and assessment strategies
4. Inadequate protection and prevention strategies
5. Inadequate vision rehabilitation strategies and quality of life measures
6. Lack of epidemiological studies of military eye trauma and TBI-related vision dysfunction
7. Inadequate vision restoration
8. Inadequate vision care education, training and simulation
9. Inadequate war fighter vision readiness and enhancement

#### MANAGEMENT OF VTRP

The VTRP is managed by the DOD's Telemedicine and Advanced Technology Research Center (TATRC) within the US Army Medical Research and Materiel Command (USAMRMC).

TATRC's VTRP programme committee consists of ophthalmic and optometric consultants to the Army, Navy and Air Force, as well as representatives from the NEI, the Food and Drug Administration (FDA) and stakeholders from the vision community, including the Association for Research in Vision and Ophthalmology (ARVO) and NAEVR. After Congress approves VTRP funding, the committee develops a programme announcement that seeks research proposals from vision researchers worldwide, evaluates the applicability of proposals to the DOD-identified vision research gaps, and determines awards after matching programmatic need with scientific peer review (conducted externally by the American Institute for Biological Sciences, AIBS).

#### AWARDS FOR VISION RESEARCHERS

Due to NAEVR's advocacy, Congress passed 2009 Defense appropriations with the first-ever dedicated VTRP budget line, funded at \$4 million (\$3.75 million in 2010). Each year, the VTRP has been supported on a bipartisan basis in Congress, as well as by the Veterans Service Organisations (VSOs) and Military Service Organisations (MSOs).

In the 2009-10 VTRP funding cycle, TATRC announced 12 grants to vision researchers that totalled \$11 million. This reflected the 2009 and 2010 Congressional VTRP appropriations of \$4 million and \$3.75 million respectively, plus \$4.1 million transferred over from TATRC's 'sister' agency within the USAMRMC, the Clinical and Rehabilitative Medical Research Program (CRMRP), minus administrative costs. In adding funds to TATRC's portfolio, the CRMRP recognised the high quality of vision research grants (which scored at the highest percentile in AIBS's peer review) and their responsiveness to DOD research gaps. The 12 awardees reflect ophthalmic and optometric researchers from the US, Ireland, and Israel who are conducting research into corneal healing, corneal and retinal protection, diagnosis and treatment of TBI and the impact of blasts.

In 2011 and 2012, Congress funded the VTRP at \$4 million and \$3.2 million, respectively. Once again, TATRC combined these amounts and awarded \$14 million in grants to 21 vision researchers, reflecting the Congressional allocations plus \$7 million transferred from other DOD agencies, minus administrative costs. In this cycle, TATRC received more than 150 grant 'pre-proposal' submissions in response to its programme announcement, which specified two types of grants: hypothesis development awards, funded up to \$250,000 each, and investigator-initiated awards, funded up to \$1 million each.

In early 2013, DOD was operating on a 2013 continuing resolution at the 2012 funding level, and final appropriations were not expected until late first-quarter 2013. Earlier in the appropriations cycle, the US House of Representatives approved a Defense bill with VTRP funding at \$10 million, while the Senate Appropriations Committee approved a bill that includes vision in a \$50 million pool of funds for defence-related health research, not as a separate line item despite intense NAEVR advocacy. NAEVR has cautioned Congress that it should not get the impression that funds transferred over to the VTRP from other DOD agencies are always going to be available – and that Congress needs to adequately fund the VTRP line as a dedicated programme, focused on all battlefield eye and vision trauma.



**NAEVR**  
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