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An interprofessional clinical advanced fellowship in rehabilitation serving Veterans with polytrauma and brain injury

Chrystyna M. Rakoczy [a, b, *], John C. Townsend [c], Jeffrey A. Cully [d], Debbie L. Hettler [e], Robert A. Zeiss [e], Deborah A. Ludke [f]

[a] James A. Haley Veterans' Hospital, Tampa FL, USA
[b] NOVA Southeastern University, College of Optometry, USA
[c] Optometric Service, Specialty Care Services (10P4E), Office of Patient Care Services, Veterans Health Administration, Department of Veterans Affairs, USA
[d] Advanced Fellowship Program, Office of Academic Affiliations, Department of Veterans Affairs, USA
[e] Associated Health Education, Office of Academic Affiliations, Department of Veterans Affairs, USA
[f] Advanced Fellowships and Professional Development, Office of Academic Affiliations, Department of Veterans Affairs, USA

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ABSTRACT

Background: Traumatic brain injury is a public health issue worldwide; about 1.7 million new incidents occur annually in the United States.
Purpose: This paper describes an innovative advanced educational fellowship in interprofessional polytrauma/traumatic brain injury rehabilitation sponsored by VA's Office of Academic Affiliations.
Method: Development and implementation of the James A. Haley Veterans' Hospital' Interprofessional Polytrauma/Traumatic Brain Injury (IP/TBI) Rehabilitation Clinical Advanced Fellowship in Optometry is described.
Discussion: This unique interprofessional educational experience is designed to enhance clinical skills of optometrists caring for Veterans with TBI and other acquired neurological disorders. Assessment and rehabilitation of visual dysfunction as part of the interprofessional rehabilitation approach are discussed.
Conclusion: The IP/TBI Rehabilitation Clinical Advanced Fellowship provides a unique opportunity for select optometrist fellows to develop advanced skills as essential interprofessional team members providing TBI visual rehabilitative care for our Nation's Service Members and Veterans.
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Background

Rehabilitation of traumatic brain injury (TBI) is a public health issue worldwide. A TBI is caused by an external blow or jolt to the head (mild TBI or concussion) or by a skull penetrating injury (severe TBI) that disrupts the normal function of the brain.[1] A recent (2010) study of United States statistics documented 1.7 million new incidents of TBI annually. Of those, 52,000 did not survive, accounting for about 30% of all injury related deaths in the US, 127,000 were hospitalized and 1.365 million were treated and released.[1] Leading causes of TBI among civilians included falls, motor vehicle accidents, assaults and blunt trauma. Sports injuries were responsible for approximately 3% of hospitalizations for TBI.[2,3]

According to the most recent data collected by Armed Forces Health Surveillance Center (2012), TBI has been designated as the "signature wound" of the current military conflicts in south-west Asia. All TBI from combat and non-combat injuries 2000–2014 has totaled 307,283 diagnosed individuals[4] of which roughly 82% were classified as mild, 8% moderate, 1% severe and 7% not classified.[5] 2% were classified as penetrating injuries. For comparison, only 1573 amputations have been reported between 2000 and 2014.[5] As extraordinary needs of Service Men and Women emerge, Department of Veterans Affairs (VA) services and facilities evolve to play an ever more vital role in the evaluation and treatment of this unique patient population. VA continually reassesses and updates its professional education programs, pioneering new treatment and rehabilitation approaches and responding to the changing needs of those who have served in the military.

The effects of TBI are far reaching.[3] Cognitive, physical, interpersonal, social, and emotional disabilities are prevalent even in mild, post-concussive injury. These disabilities can result in enduring consequences affecting not only the individual, but families, caregivers, and communities as well.[6] The recovery process can last years and its rate varies over time. The economic burden of TBI from loss of productivity and medical costs has been estimated at $60 billion annually in the U.S. [6,7] Civilian medical cost for rehabilitation of new injuries alone has been estimated at $9–$10 billion per year and lifetime care ranges from $600,000 to $1,875,000 per injured person.[3]

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* Corresponding author. James A. Haley Veterans' Hospital, Eye Clinic, 10770 N. 46th Street, Tampa, FL 33617, USA. Tel.: +1 813 972 2000 x6174; fax: +1 813 631 6747.
E-mail address: Chrystyna.Rakoczy@va.gov (C.M. Rakoczy).

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The goals of rehabilitation, which can be life-long, are to improve cognitive and physical function and to modify behavior in an effort to reintegrate the individual into productive family and community life. Physical and cognitive rehabilitation using compensatory and restorative measures often rely on an interprofessional approach provided by a diverse team of health care professionals.[8] Successful rehabilitation often engages the disciplines of physiatry, physical therapy, occupational therapy, audiology, neuropsychology, psychology, neuro-ophthalmology and optometry,[3] working together, with the patient, to improve the rehabilitation outcomes. In complex traumatic brain injury, interprofessional teams can use time more efficiently, coordinate services, integrate health care for a variety of needs, and empower patients as active partners in care. Further, an interprofessional team is able to integrate and synthesize knowledge and contributions of each discipline, resulting in comprehensive understanding and approaches that are more than the sum of the individual parts.[9] Interprofessional education and collaborative practice can play a significant role in mitigating many of the challenges faced by health systems around the world.[10] Effective interprofessional education fosters respect among the health professions, eliminates harmful stereotypes, and evokes a patient-centered ethic in practice.[11]

The main purpose of this paper is to describe an innovative advanced clinical educational fellowship program in interprofessional polytrauma/traumatic brain injury (P/TBI) rehabilitation, sponsored by VA's Office of Academic Affiliations (OAA). The development of this program arose from the need for vision services for this very Veteran population with multifaceted challenges, as visual dysfunction secondary to TBI has a dramatic effect on rehabilitation as well as on activities of daily living and quality of life.[12,13] Tapping into the resources of VA's OAA and the Polytrauma System of Care services provided at the James A. Haley Veterans' Hospial (JAHVH), the Interprofessional Polytrauma/TBI (P/TBI) Rehabilitation Clinical Advanced Fellowship in Optometry became the first clinical post-residency educational program to integrate the assessment and rehabilitation of visual dysfunction with multisensory and multimodal rehabilitation in TBI and polytrauma.

Early research on vision dysfunction leading to development of the clinical fellowship

Since 1992, the VA Palo Alto Health Care System (VAPA HCS) has been designated as one of four VA Brain Injury Centers in partnership with the Defense and Veterans Brain Injury Center (DVBIC). Since Operation Iraqi Freedom started in 2003, there have been increasing numbers of Veterans with severe brain and life-threatening injuries who subsequently presented to the VAPA HCS for care. The Physical Medicine & Rehabilitation (PM&R) Service at VAPA HCS recognized that there was a need for a collaborative interdisciplinary approach to provide comprehensive rehabilitation care to address these polytraumatic injuries.

In 2004, VAPA HCS was selected as one of three sites for the new VA Optometric Research Fellowship Program developed in partnership between OAA and VA's Optometric Service. The purpose of this two-year post-residency fellowship program was to ensure the continuation and future development of VA optometric research in age-related eye diseases and vision disorders, to improve visual rehabilitation capabilities, and to enhance visual outcomes.

The need for basic and clinical research to determine the ocular conditions and visual functioning problems in this polytraumatic Veteran population soon became apparent. There were no available clinical practice guidelines and few publications regarding eye and visual complications associated with any TBI. Ultimately, this resulted in the VA Palo Alto Fellowship Coordinator, Optometric Research Fellows, and Rehabilitation Optometrists collaborating with the Palo Alto PM&R Service to develop this vitally important baseline information.

During the same time period, an integrated VA Polytrauma System of Care was developed by VA's Office of Rehabilitation Services. From most to least complex, this system of care consists of 5 Polytrauma Rehabilitation Centers (PRC) each with accompanying Polytrauma Transitional Rehabilitation Programs (including VAPA HCS and VA (name omitted)), 22 Polytrauma Network Sites, 86 Polytrauma Support Clinic Teams, and 45 Polytrauma Points of Contact at select VA medical facilities.[14]

In 2007, findings of VAPA research published in the *VA Journal of Rehabilitation Research and Development (JRRD)* reported a higher prevalence of convergence dysfunction (30.4%), visual spatial deficits (30.4%), accommodative dysfunction (21.7%), pursuit/saccade dysfunction (19.6%), and reading problems (60.9%) in the VA Palo Alto PRC patients who had a diagnosis of TBI.[15]

In 2008, VA's Office of Research and Development convened a conference to examine “Research to Improve the Lives of Veterans: Approaches to Traumatic Brain Injury; Screening, Treatment, Management, and Rehabilitation” in Arlington, Virginia. Participants included an interdisciplinary group of 100 researchers, clinicians, and administrators from VA, Department of Defense, National Institutes of Health, Defense and Veterans Brain Injury Center, and academia. Proceedings were published in a special Traumatic Brain Injury – State-of-the-Art: Single Topic Issue in *JRRD*, Volume 46, Number 6, 2009.[16]

The 2007 *JRRD* research findings and the 2008 VA conference were instrumental in the development of a new policy that detailed the TBI-specific ocular health and visual function examination that every Veteran admitted to a Polytrauma Rehabilitation Center with a diagnosis of traumatic brain injury would receive.[17]

History of VA's Office of Academic Affiliations

VA's Office of Academic Affiliations (OAA) administers all formal clinical educational programs in VA. OAA portfolios include: 1) Accredited medical and dental residency and fellowship programs; 2) Accredited associated health (by OAA usage, “Associated Health” refers to all health professions other than physicians, nursing, and dental) internships, residencies, fellowships, and other training programs, including those in the fields of psychology, social work, podiatry, optometry, and pharmacy; 3) Nursing education; and 4) Advanced research and clinical fellowships for all professions. Advanced fellowships seek to develop leaders in clinical practice, scholarship, education, and policy around the focused area of health care improvement. Advanced Fellowships are non-accredited, allowing VHA to target innovative or scholarly training initiatives that are not yet recognized as accreditable medical specialties. In fiscal year 2013, VA provided training to over 118,000 trainees from over 40 disciplines. Trainees included approximately 40,000 physician residents, 21,000 medical students, 31,000 associated health trainees from numerous disciplines, 23,000 nursing students, 1300 dental students and residents, and 253 advanced fellows.

Interprofessional Polytrauma/TBI Rehabilitation Clinical Advanced Fellowship Program development

The Interprofessional Polytrauma & Traumatic Brain Injury (P/TBI) Rehabilitation Advanced Fellowship Program is part of OAA's Advanced Fellowship portfolio and was started in 2009. The P/TBI program was designed to provide advanced training to meet the growing needs of Veterans returning with all forms of TBI,