I. Introduction

A. This clinical education grant proposal focuses on developing “user-friendly” materials to teach VA health care providers about the presentation and management of traumatic brain injury (TBI). Often called “the invisible injury”, the majority of TBIs are mild to moderate in severity with cognitive, emotional, and behavioral problems that are frequently undetected—or misunderstood—by health care providers. Recognition of TBI is particularly important in the VA clinical arena given the incidence of TBI in theatres of war where explosive devices are increasingly utilized. According to data from the Defense of Veterans Brain Injury Center, greater than 60% of soldiers medically evacuated from Iraq due to blast injuries were found to have a TBI. TBI is also a common consequence of motor vehicle accidents, penetrating wounds to the head, and falls. As clinicians with expertise in TBI, we hope to create novel educational resources to assist our colleagues in recognizing, diagnosing, and managing this prevalent neuropsychiatric injury.

B. In our survey of resources designed to inform health care providers about TBI, we found a sizable gap in educational materials specific to combat-related TBIs. Motivated providers may take a Veterans Health Initiative course that offers comprehensive and contemporary information about TBI; however, this course requires several hours of study. General information about TBI is available on various websites including those maintained by state-level Brain Injury Associations. However, no concise educational tool was identified that guides health care providers in recognizing and treating “military TBI”.

C. With the financial assistance afforded by a MIRECC educational grant, we intend to produce an easy-reference brochure to accompany a web-based power-point presentation on veteran-specific TBI. These resources will equip providers with key information about the complexities and subtleties of TBI in order to overcome diagnostic and treatment challenges. The brochure will also provide referral information for specialized evaluation and treatment of TBI applicable to VA facilities nation-wide.
II. Description of the Project

A. The target audience will be VA health care providers—particularly clinicians working in primary care, mental health, neurology, and physical medicine and rehabilitation.

B. Four MEDVAMC physicians will collaborate on this project:

- Kimberly A. Arlinghaus, MD specializing in consult/liaison psychiatry, neuropsychiatry, and management of TBI
- Helene Henson, MD, who has experience in TBI and plays a key role in planning for the Polytrauma Center at MEDVAMC
- Janet Hickey, MD, who is gaining experience in managing neuropsychiatric conditions and has been accepted as a behavioral neurology fellow at the MEDVAMC beginning July 2006
- Stephanie Sneed, MD, who recently completed a fellowship at The Institute for Rehabilitation and Research—a tertiary referral center in Houston, Texas providing state-of-the-art evaluation and treatment of TBI

C. Clinical providers at MEDVAMC will be consulted to optimize the accessibility and educational impact of the brochure. The power-point presentation will be piloted at MEDVAMC with a group of providers in primary care, mental health, rehabilitation, and neurology. Feedback about the presentation will be used to enhance the educational quality of the presentation. We will also solicit suggestions from investigators and education affiliates of the South Central MIRECC. The accuracy and specificity of referral information will be confirmed through consultation with other VA facilities and medical providers at the Network level.

D. In order to provide the most accurate and up-to-date information about combat-related TBI, we will conduct a literature search for contemporary publications about TBI in the veteran population, especially blast injury. Essential information about TBI will be presented in the brochure (definitions, epidemiology, types of injury, common sequelae, and tips for diagnosis and treatment). Information about referral for medical evaluation and treatment as well as support services will be included. The brochure design will attract the attention of the intended audience and the content will be presented in a simple, clear fashion. Graphic illustration will be utilized to assist the reader in visualizing the mechanisms of traumatic brain injury and the brain-behavior relationships that account for the pattern of symptoms and signs. The information presented in the brochure will be amplified and illustrated in the power-point presentation. Assistance with the technical construction and web-based distribution of the power-point presentation will be requested from the South Central MIRECC (narration, production of a CD, archiving on the web). Work has already begun on this project (literature review and paths for referral within the VA system of healthcare). With funding of this grant, we hope to produce a high quality brochure and portable power-point presentation within six months of receipt of the funding.

E. The impact of the project will be evaluated by tracking the number of veterans who present to a new multidisciplinary MEDVAMC TBI clinic. The clinic will be launched prior
to completion of this project. We will compare the number of clinic consultations received after distribution of the brochure and power-point presentation with the pre-distribution consult volume. We expect an increase in consultations after the power-point presentations are delivered and the brochures distributed—this will be one measure of success. We also plan to obtain feedback from other VA facilities regarding the impact of the brochure and power-point presentation on recognition and management of TBI. The tracking and collection of feedback will continue for six months after the distribution.

F. In regard to local incentives and mechanisms to encourage active learning about TBI, the MEDVAMC holds a number of highly visible and well-attended conferences that offer excellent opportunities to present the products of this clinical education grant. In addition to Grand Rounds presentations, the Mental Health Care Line presents a monthly conference that reaches all mental health disciplines. We’ve also started a new clinical case conference joining primary care providers and mental health practitioners affording an ideal atmosphere for collaborative learning. The educational tools produced in this project would also be of interest to various residency programs at Baylor College of Medicine for possible addition to didactic curricula. Further incentives include continuing medical education credits, mandatory attendance, and the convenience of a modest breakfast or lunch at a variety of these educational events.

III. Future Plans

A. After completion of this project, we would like to create educational materials for veterans and their families. Arming both providers and patients with information about TBI increases the likelihood of recognition, diagnosis, and treatment. Because veterans may receive treatment outside the VA system, it is also important to collaborate with medical school affiliates and private practice physicians in order to provide education about TBI that is veteran-specific.

B. With regard to the long-term impact of our project, we hope to reach more veterans and families as our bridges to the community increase. For example, we hope to collaborate with a state-supported referral service in Texas, “2-1-1 Texas”. 2-1-1 is a free, confidential information and referral line answered by nationally certified specialists 24 hours per day, seven days per week. These trained experts have access to the most comprehensive database of community-based organizations, government agencies, and nonprofits that exist in Texas. Callers can find information about health and human services in their local community or details on specialized services located nearest them. Dr. Arlinghaus is already involved in a collaborative effort to raise awareness of combat-related TBI in the wake of OIF/OEF in which regional VA and DOD representatives work with the Brain Injury Association of Texas and 2-1-1 managers to coordinate TBI education and referral across the state. With the portability of the brochure and power-point presentation, we have an opportunity to reach thousands of providers, patients, and families.

IV. Budget

A. In order to accomplish the goals of this project, we will consult with medical illustration experts to assist us with overall design and utilization of graphics in the brochure and power-point presentation. The brochure will be reproduced using high-quality glossy paper. An interactive component may be added to the brochure allowing the reader to
manipulate one or more of the graphics to illustrate mechanisms of TBI (pending approval of the grant review committee). Once the brochure is created, a master copy will be forwarded to the South Central MIRECC for distribution. The power-point presentation will also be forwarded to the MIRECC. Production of a CD with a narrated version of the power-point presentation will be accomplished in collaboration with the South Central MIRECC. The budget may be adjusted to accommodate the cost of these MIRECC-level activities per the direction of the grant review committee.

B. Two proposed budget alternatives are detailed below utilizing Medical Illustrations personnel at Baylor College of Medicine (based on preliminary estimates obtained from graphics expert):

High-level graphics

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<thead>
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<th>Service</th>
<th>Cost</th>
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<tr>
<td>Graphics consultation</td>
<td>$ 1,000</td>
</tr>
<tr>
<td>Interactive design</td>
<td>$ 1,000</td>
</tr>
<tr>
<td>Reproduction</td>
<td>$ 1,000 (first 2,000 copies)</td>
</tr>
<tr>
<td></td>
<td>$ 2,000 (additional 6,000 copies)</td>
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</table>

**Total estimated cost $ 5,000 (8,000 copies)**

Low-level graphics

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Graphics consultation</td>
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</tr>
<tr>
<td>Reproduction</td>
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<tr>
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<td>$ 3,000 (additional 12,000)</td>
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**Total estimated cost $ 4,850 (14,000 copies)**