

COMMONWEALTH NEUROTRAUMA INITIATIVE ADVISORY BOARD

ANNUAL REPORT

For State Fiscal Year 2007

(July 1, 2006 to June 30, 2007)

The Code of Virginia Section 51.5-12.3(C)(4) requires the Commonwealth Neurotrauma Initiative (CNI) Advisory Board to “[r]eport annually on October 1, to the Governor and the General Assembly, aggregate data on the operations and funding of the . . . [CNI Trust Fund].” The information contained herein constitutes the October 1, 2007 CNI Annual Report.

EXECUTIVE SUMMARY

In December, 2006, the current CNI Advisory Board chair, David B. Reid, Psy.D., was re-elected as Chair of the Advisory Board (eligible in the Board By-Laws for reelection after a term of one-year) for another term of one year.

The Advisory Board issued a Request For Proposal (RFP) #07-302 on January 30, 2007, with a response date of March 29, 2007, to receive proposals for research on the mechanisms and treatment of neurotrauma (Option A). The Board designated the following priorities for projects: 1) projects that demonstrate the importance of the project for research on the mechanisms and treatment of neurotrauma, and expanding opportunities for such individuals to become as independent and physically and functionally capable as possible; 2) justified the need for the project by documenting the lack of alternative resources available, by documenting that the project does not duplicate existing research or by documenting that expansion of research is necessary; 3) included an outcomes measurement system for allowing for monitoring and documenting of project impact, including anticipated long-term impact of the project; 4) as relevant to the specific project, provide for consumer involvement in project design, implementation, and evaluation; and 5) as relevant to the specific project, emphasize a commitment to collaborative community planning involving consumer groups, service providers, employers, other funding sources, and state agencies.

The Board received twenty-one proposals and funded six of them for a total of \$2,364,562 to begin the one to three-year contract periods in State Fiscal Year 2008 and ending in State Fiscal Year 2010. Grant recipients are:

- The University of Virginia; PI: Peter Patrick, Ph.D. (\$450,000/3 years) ***3rd year of funding contingent on board approval for release of funds.*
- Virginia Commonwealth University; PI: Dong Sun, MD, Ph.D. (\$434,408/3 years)
- Virginia Commonwealth University; PI: Christina Marmarou, Ph.D. (\$443,407/3 years)
- Virginia Commonwealth University; PI: Robert Hamm, Ph.D. (\$227,071/3 years)
- Virginia Commonwealth University; PI: Severn Churn, Ph.D. (\$360,928/3 years)

- Virginia Commonwealth University; PI: Thomas Reeves, Ph.D. (\$448,648/3 year)

During this reporting period, the Fund had thirteen (13) active community-based and research grants totaling \$1,753,552.80. Five (5) grants completed their final year of funding. Four (4) of the grants were *Option-A Research on the Mechanisms and Treatment of Neurotrauma* grants which were slated to end July 31, 2006. All four previously had received no-cost extensions from one to six months in length. The fifth grant that completed the final year of funding was an *Option-A research grantee* (awarded under the 2004 budget amendment granting the Commissioner of the Department of Rehabilitative Services authority to reallocate up to \$500,000 from unexpended balances in the Commonwealth Neurotrauma Initiative Trust Fund to fund new grant awards for research on traumatic brain and spinal cord injuries) that completed its contract award during State Fiscal Year 2007 due to a second no-cost extension.

During this reporting period, two grantees received “no cost extensions.” The first no-cost extension was an *Option-B* community rehabilitation program which was only awarded one year of funding, originally slated to end June 30, 2007. The extension gives this program an additional six months to finish program activities. The second aforementioned grantee was awarded under *Option-A* research (under the 2004 budget amendment granting the Commissioner of the Department of Rehabilitative Services authority to reallocate up to \$500,000 from unexpended balances in the Commonwealth Neurotrauma Initiative Trust Fund to fund new grant awards for research on traumatic brain and spinal cord injuries) which was awarded a second no-cost extension through June 30, 2007; the original no-cost extension slated to end December 31, 2005. Such extensions, which are typically granted for three to twelve months, allow grantees to use their unexpended funds to continue project activities (such as analyzing data, preparing reports, and distributing results) beyond the ending date of their grant award.

During this reporting period, four (4) grantees awarded under Option B, Community-based Rehabilitative Services were approved to carry forward grant funds from State Fiscal Year 2006 to State Fiscal Year 2007 totaling \$228,131.73. Requests to “carry forward” unexpended funds from one grant year to the next are common due to inevitable delays or changes in late start up, hiring staff, ordering and equipping an office or laboratory, and similar challenges.

Also, one Option-B Community-Based Rehabilitative Services grantee was awarded an additional \$5,800 for the second year of their grant contract due to an expansion in their scope of services involving accommodations for their consumers not originally anticipated as a requirement for the execution of the grant.

Program Operations

The Advisory Board held four quarterly meetings in 2007. On September 21, 2006 the Board held the 2nd Research Colloquium (and 3rd Colloquium in total) in Richmond. The Colloquium was initially named in 2004 in recognition of the late Senator Emily Couric, whose efforts created the initial legislation for the Trust Fund. The 2nd Research Colloquium provided an opportunity for current CNI research grantees to again highlight their projects and report

results to the Board and to fellow grantees. Past grant recipients were also invited to the Colloquium to learn about the work of their fellow researchers who were funded in the second round of Option-A *Research on the Mechanism and Treatment of Neurotrauma* RFP. The Colloquiums provide a unique forum for Virginia researchers to network and share resources with one another. Twenty-eight individuals attended the Colloquium A broader goal of the Colloquium was achieved when several researchers discussed a history of collaborating on research in Virginia as a result of the first Research Colloquium held in April 2004. Additionally, many of the evaluations indicated an interest in expanding the audience for the Colloquiums beyond current and past grantees by increasing marketing efforts and changing the location of the event to one that will allow for a larger crowd to showcase the research completed in Virginia. The Board is taking this under advisement for the planning of future research colloquiums.

The Board re-elected David B. Reid, Psy.D. as the Chair at its December 8, 2006 meeting in Richmond. Dr. Reid, Clinical Psychologist and Chief Operating Officer of Comprehensive Health Systems of Fishersville, will serve as the CNI Board Chair for a one-year period (renewable). Dr. Reid was appointed to the Board in July, 2005 to serve a four-year term, filling the Board vacancy for a *person licensed by a health regulatory board within the Department of Health Professions with experience in brain or spinal cord injury rehabilitative programs or services*. He was initially elected as Board Chair in December, 2005.

Administrative staff for the fund went from one full time position and one part-time (15%) position until half way through State Fiscal Year 2007 when an additional part-time (15%) position was added.

Previous grantees receiving funding under Option-A "*Research on the Mechanisms and Treatment of Neurotrauma*" have begun to show evidence that CNI research dollars have an impact that reaches far beyond the initial three-year funding period. As a result of these findings, the Advisory Board requested that staff work with past research grantees to make note of peer-reviewed journal publications resulting from CNI funded research and to look at additional federal grant dollars that may have been awarded as a result of CNI research used as leverage to gain additional funds (e.g. National Institute of Health (NIH) etc.). Grantees are strongly encouraged to submit publications to the Advisory Board. These two pieces are provided at the end of the report and will remain as ongoing lists for future reports.

Program Funds

Moneys have been collected and deposited into the CNI Trust Fund since 1998, when a citizen donated \$25 to the Fund. The funding mechanism for CNI (a reinstatement fee charged to restore an operator's license when it has been revoked or suspended for specified dangerous driving offenses) was established by legislation in 1998, a year after the Trust Fund and the Advisory Board were established in the Code of Virginia. The CNI Trust Fund is a special nonreverting fund in the state treasury. The Fund balance has continually increased by operation of the statutory funding mechanism in which a portion of the reinstatement fee is deposited into the Fund (\$25 out of the \$30 fee collected).

The fund consists of grants, donations, and bequests from the public or private sources and funds collected as provided in § 46.2-411 of the Code. The revenue in State Fiscal Year 2007 averaged about \$107,000 per month, or about \$1.28 million annually. Though the money coming into the Fund has remained relatively stable since it was established, there is always the possibility that revenue will increase or decrease during any given fiscal year. In State Fiscal Year 2007, staff administrative costs were budgeted at \$81,804 and \$63,216 was expended. Administrative costs for State Fiscal Year 2008 have been budgeted at \$82,092.

History, Background and Legal Framework

Fiscal Year 1997-98 (SFY 1998): Effective July 1, 1997, Senate Bill 1132 (Acts of Assembly, c. 567) established the Commonwealth Neurotrauma Initiative (CNI). Article 12 of Chapter 2 of Title 32.1 (§32.1-73.1 *et seq.*) of the Code of Virginia authorizes establishment of the CNI Trust Fund, a special nonreverting fund, and the CNI Advisory Board, a permanent collegial body affiliated with the State Board of Health pursuant to §2.1-1.6 of the Code.

The first CNI Advisory Board members were sworn in on October 6, 1997. John D. Ward, M.D. was elected as the Board's first Chairman during a meeting held on November 18, 1997. The Advisory Board adopted by-laws outlining the powers and duties of the Board on April 9, 1998. The first Annual Report was submitted to the Governor of Virginia on October 1, 1998.

Fiscal Year 1998-99 (SFY 1999): Effective July 1, 1998, Senate Bill 484 (Acts of Assembly, c. 703) amended the CNI law. As amended, §32.1-73.2 (B) provides that: (i) moneys in the CNI Trust Fund "shall be used solely to support grants for Virginia-based organizations, institutions, and researchers" and (ii) "fifty percent [of the moneys in the Fund] shall be allocated for research on the mechanisms and treatment of neurotrauma [referred to as "*Option-A*" below] and fifty percent shall be allocated for rehabilitative services [referred to as "*Option-B*" below]."

The 1998 legislation also created a mechanism for funding the CNI. Moneys are deposited into the Trust Fund pursuant to §18.2-271.1 (E) of the Code of Virginia. That section of the Code provides that a fee of \$105 shall be charged "for reinstatement of the driver's license of any person whose privilege or license has been suspended or revoked as a result of . . . [a specified traffic violation]," and \$25 of this fee "shall be transferred to the . . . [CNI] Trust Fund." This mechanism continues to operate, placing additional moneys into the Fund on an ongoing basis.

Fiscal Year 1999-2000 (SFY 2000): The Advisory Board completed draft policies and procedures for the administration of the Fund. In November, 1999, these draft policies and procedures were forwarded as recommendations to the State Board of Health for promulgation.

Fiscal Year 2000-01 (SFY 2001): Regulations were promulgated by the Virginia Department of Health (VDH) implementing the Commonwealth Neurotrauma Initiative (CNI)

Trust Fund; the regulations became effective on February 14, 2001. The first Request For Proposals (RFP), soliciting both *Option-A* and *Option-B* proposals, was issued on March 1, 2001.

Fiscal Year 2001-02 (SFY 2002): The Advisory Board approved thirteen (13) out of 25 proposals in response to the RFP issued in State Fiscal Year 2001: eleven (11) *Option-A* and fourteen (14) *Option-B* proposals were received. The total amount approved for funding was \$3.5 million over a three-year period, 2002-2004. Information on the specific grant proposals funded during State Fiscal Year 2002 was included in the October 1, 2002 CNI Annual Report. Descriptive and contact information for all grantees is available on the CNI website at www.vacni.org. To protect the financial viability of the program as well as to streamline the process and enhance the administration of the grants program, the Advisory Board voted to issue future RFPs for *Option-A* and *Option-B* grants during alternating grant cycles occurring twice a year, as funds permit.

Fiscal Year 2002-03 (SFY 2003): Effective July 1, 2002, the General Assembly enacted legislation to amend and reenact Section 46.1-422 of the Code of Virginia, by adding Title 51.4a, Chapter 3.1 and repealing Article 12 (§32.173.1 et. seq.) of Chapter 2 of Title 32.1 relating to the Commonwealth Neurotrauma Initiative. The change designated the Department of Rehabilitative Services (DRS) as the agency responsible for administering the Commonwealth Neurotrauma Initiative (CNI) Trust Fund (transferred from the Department of Health) and authorized a portion of the Trust Fund (no more than 5% annually) to be used for administration (i.e., staff support for the CNI Advisory Board, as well as the cost of reviewing and monitoring grant proposals). The legislation also changed the allocation of funds by specifying that “moneys in the Fund shall be used solely to support grants for Virginia-based organizations, institutions, and researchers” as follows (i) “forty-seven and one-half percent [of the moneys in the Fund] shall be allocated for research on the mechanisms and treatment of neurotrauma and (ii) forty seven and one half percent shall be allocated for rehabilitative services, and (iii) five percent shall be allocated for the Department of Rehabilitative Services’ costs for administering and staffing the Commonwealth Neurotrauma Initiative Advisory Board.”

A Request For Proposals (RFP) for *Option-A: Research on the Mechanisms and Treatment of Neurotrauma* was issued February 1, 2003, with a deadline of April 1, 2003 for receipt of applications. The Advisory Board approved eight (8) of fourteen (14) *Option-A* proposals received in response to the RFP. The total amount approved for funding was \$2,096,301 over a three-year period (beginning in 2004 and ending in 2006). Information on the specific grant proposals approved for funding under the 2003 RFP by the Advisory Board at its December 11, 2002 (*Option-B*) and June 25, 2003 (*Option-A*) meetings was reported in the October 1, 2003 CNI Annual Report. Descriptive and contact information for all grantees is available on the CNI website at www.vacni.org.

During State Fiscal Year 2003 the CNI Trust Fund awarded \$1,571,103 in grant funding to seven (7) *Option-B* proposals. Five (5) grantees approaching the end of their first grant year requested carryover of funds to year two; the total amount of new grant funding disbursed during was \$1,985,067. Administrative costs were budgeted at \$60,000; \$48,752 was expended.

Fiscal Year 2003-04 (SFY 2004): On April 22, 2004 the Commonwealth Neurotrauma Initiative (CNI) Advisory Board held the inaugural *Tri-Annual Emily Couric Research Colloquium* in Richmond. The Colloquium was named in recognition of the late Senator Emily Couric, whose efforts created the initial legislation for the Trust Fund. The *Research Colloquium* provided an opportunity for CNI research grantees to highlight their projects and report results to the Board and to fellow grantees. It also provided a unique forum for Virginia researchers to network and share resources with one another. Members of the CNI Advisory Board, thirteen (13) research grantees, and other interested parties attended or participated in the Colloquium. Steve Harms, Deputy Secretary of Health and Human Resources, was a guest speaker. A broader goal of the Colloquium was achieved when several researchers discussed plans for conducting future collaborative research projects with their colleagues across the Commonwealth.

A budget amendment was passed during 2004 General Assembly that empowers the Commissioner of the Department of Rehabilitative Services (DRS) to require applicants to the CNI Trust Fund to develop a plan for self-sufficiency when their two-or three-year grant award period ends. It also allows the Commissioner to redistribute unspent grant funds from prior years for new research activities.

During this reporting period, the Advisory Board did not issue a Request For Proposals (RFPs). To support the grant awards approved in previous years, funds were encumbered through State Fiscal Year 2006. During 2004, one *Option-B* community rehabilitation services grantee funded initially in 2003 was awarded second and third years of funding. Another *Option-B* grantee funded initially in 2003 was awarded a second year of funding, with funding for the third year contingent upon review of their request by the Advisory Board in 2004.

A total of nine (9) grantees requested carryover of grant funds from 2003 to 2004. Seven (7) of the carryover requests came from *Option-B* (community rehabilitation services) grantees: six grantees carried funds from year one to two, and grantee carried funds from year two to three. Two *Option-A* research grantees asked for and received approval for carryover of funds to the third and final year of their grant awards. Two (2) *Option-A* (research) grants (from the inaugural round of research awards in 2002- completed their grant years during 2004. Note that both requested funding for only two years, rather than the more common request for three years of funding.

For State Fiscal Year 2004, staff administrative costs were budgeted at \$80,000; \$67,000 was expended. A full-time Program Specialist was hired in November, 2003 when the previous staff person retired in June. CNI funds a full-time Program Specialist and two additional part-time staff for program and fiscal management.

In State Fiscal Year 2004, a budget Item 349#3c allowed the Commissioner of the Department of Rehabilitative Services (DRS) to “require applicants to submit a plan to achieve self-sufficiency by the end of the grant award cycle in order to receive funding consideration.” Additionally, “notwithstanding any other law to the contrary, the Commissioner may reallocate

up to \$500,000 from unexpended balances in the Commonwealth Neurotrauma Initiative Trust Fund to fund new grant awards for research on traumatic brain and spinal cord injuries.”

Fiscal Year 2004-05 (SFY 2005): The four-year terms of two CNI Advisory Board members ended on June 30, 2004. Dr. Gregory Helm of UVA Medical Center in Charlottesville and Dr. Richard Bendall of Lynchburg were appointed to fill the vacancies. They will serve four-year terms beginning July 1, 2004 and ending June 30, 2008.

The revenue for the CNI Trust Fund averages about \$114,000 per month or about \$1.36 million annually. At the end of this reporting period, the balance of funds available for grant awards is approximately \$61,000. This amount includes funds that are unencumbered for grant or administrative costs, unexpended grant dollars returned to the Fund, and reinstatement fee revenue. An additional, \$80,000 has been obligated and approved by the Advisory Board and budgeted for administrative costs during 2006.

Fiscal Year 2005-06 (SFY 2006):

In December of 2005, a new CNI Advisory Board chair, David B. Reid, Psy.D., “*One person licensed by a health regulatory board within the Department of Health Professions with experience in brain or spinal cord injury rehabilitative programs or services*” was elected for a term of one year, eligible in the Board By-Laws for reelection after a term of one-year.

The Advisory Board issued a Requests For Proposal (RFP) #06-327 on April 5, 2006 due June 5, 2006 for Option-B Community-Based Rehabilitative Services to establish contracts to develop, expand, or improve community-based rehabilitative programs / services for individuals experiencing traumatic spinal cord or traumatic brain injuries or both. The Board received sixteen proposals and funded seven of them for a total of \$2,075,182.75 to begin the one to three-year contract periods beginning in FY’07 and ending in FY’09.

During this reporting period, a total of seven (7) grants completed their final year of funding. Six (6) of the grants were *Option-B* community rehabilitation grants which were slated to end December 31, 2005. Of these six, four received no-cost extensions from one to six months in length. The seventh grant that completed their final year of funding was an *Option-A* research grantee (awarded under the FY’04 budget amendment granting the Commissioner of the Department of Rehabilitative Services authority to “...reallocate up to \$500,000 from unexpended balances in the Commonwealth Neurotrauma Initiative Trust Fund to fund new grant awards for research on traumatic brain and spinal cord injuries,”) that completed its contract award during SFY ’06.

During this reporting period, a total of twelve (12) grantees received “no cost extensions.” Five (5) of the grantees were *Option-B* community rehabilitation programs which were slated to end December 31, 2005, with one of the five being granted a 12 month extension pushing its contract end date to FY’07. Five (5) grantees were *Option-A* research projects (from the 2nd round of research awards scheduled to end July 31, 2006). Two of the twelve grantees to receive “no cost extensions” were awarded under the aforementioned FY’04 budget amendment granting the Commissioner the authority to award research grants.

During this reporting period, a total of twelve (12) grantees requested carryover of grant funds from SFY 2005 to SFY 2006. Five (5) of the grantees were *Option-B* community rehabilitation program grant contracts that carried funds over from year two to year three and seven (7) were *Option-A* research projects that carried funds over from year two to three. Requests to “carry forward” unexpended funds from one grant year to the next are common due to inevitable delays or changes in hiring staff, ordering and equipping an office or laboratory, and similar challenges.

For FY’06, staff administrative costs were budgeted at \$80,000; \$80,622.63 was actually expended.

Fiscal Year 2006-07 (SFY 2007):

Further information on FY ’07 program operations and funds is contained in the body of this report. Please refer to relevant sections above.

Publications Resulting from CNI Trust Fund Grant Dollars

Articles:

Blackman, J.A., Patrick, P.D., Buck, M.L., Rust, R.S. Paroxysmal autonomic instability with dystonia following brain injury. Arch Neurol, 2004;61:321-328.

Cohen A, Pfister BJ, Schwarzbach E, Grady S, Goforth PB and **Satin LS** (2007). Injury-induced alterations in CNS electrophysiology. Prog. Brain Res. 161: 143-69.

Goforth, P.B., Ellis, E.F. and **Satin, L.S.** (2004). Mechanical injury modulates AMPA receptor kinetics via an NMDA receptor dependent pathway. J. Neurotrauma 21: 259-270.

Li Y, Oskouian RJ, Day YJ, Rieger JM, Liu L, Kern JA, Linden J.
<http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=16777350&ordinalpos=16&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum> Mouse spinal cord compression injury is reduced by either activation of the adenosine A2A receptor on bone marrow-derived cells or deletion of the A2A receptor on non-bone marrow-derived cells. Neuroscience. 2006 Sep 15;141(4):2029-39.

Li Y, Oskouian RJ, Day YJ, Kern JA, Linden J.
<http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=16506485&ordinalpos=19&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum> Optimization of a mouse locomotor rating system to evaluate compression-induced spinal cord injury: correlation of locomotor and morphological injury indices. J Neurosurg Spine. 2006 Feb;4(2):165-73.

Lieu, A.S., Li, J.Z., Webb, D.J., Hankins G.R., Howng S.L., and Helm, G.A. Functions of G Protein-Coupled Receptor Kinase Interacting Protein 1 in Human Neuronal (NT2N) Cells. J. Neurosurg. 105:103-110, 2006.

Kao, C., Goforth P.B., Ellis, E.F. and **Satin, L.S.** (2004). Potentiation of GABAA currents after mechanical injury of cortical neurons. J. Neurotrauma 21: 259-270

Okonkwo DO, Reece TB, Laurent JJ, Hawkins AS, Ellman PI, Linden J, Kron IL, Tribble CG, Stone JR, Kern JA.

<http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=16506468&ordinalpos=20&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum> A comparison of adenosine A2A agonism and methylprednisolone in attenuating neuronal damage and improving functional outcome after experimental traumatic spinal cord injury in rabbits. J Neurosurg Spine. 2006 Jan;4(1):64-70.

Patrick, P., Mabry, J., Buck, M., Gurka, M., Blackman, J., “MRI patterns in prolonged low response states following traumatic brain injury in children and adolescents”, Brain Injury, 21(1): 63-8 2007

Patrick, P., Mabry, J., Buck, M., Gurka, M., Blackman, J., “Dopamine agonist therapy in low response children following traumatic brain injury”, Child Neurology 2006

Ueda, Y., Wei, E. P., Kontos, H. A. and Povlishock, J. T. Uncomplicated rapid posthypothermia rewarming alters cerebrovascular responsiveness. Stroke 35:601-66, 2004.

Book/Chapter:

Ueda, Y., Wei, E. P., and Povlishock, J. T. Pial microcirculation evaluated by closed cranial window method 7 days after impact acceleration injury in rats: Does post-traumatic hypothermia provide persisting pial vascular protection. In: Hayashi, N., Bullock, R., Dietrich, D. W., Maekawa, T., and Tamura, A. (Eds): Hypothermia for Acute Brain Damage: Pathomechanism and Practical Aspects. Springer-Verlag, Tokyo 2004. pp.141-144.

Additional Funding Received through the use of CNI dollars as baseline:

“*Altered Excitatory Neurotransmission after Brain Trauma*” R01 NS049519. Principal Investigator: L.S. Satin; Agency: NINDS. 12/01/06 – 11/30/11. TDC: 1,250,000. The objective of this grant is to explore cellular and molecular mechanisms involved in brain trauma using a novel in vitro mode

“Modulation of GABAA Receptors by Traumatic Brain Injury” Principal Investigator: R. Philip Yeager; Sponsor: L.S. Satin; Agency NINDS; Kriegstein NRSA. 6/25/2006-6/24/2009. National Institutes of Health.