

**Colorado Brain Injury Program
Report to the Joint Budget Committee and
Health and Human Services Committees**

July 1, 2013 – June 30, 2014

Executive Summary of the Legislative Report:

The Colorado Brain Injury Program was created by Title 26, Article 1, Part 3 of the Colorado Revised Statutes, to improve the lives of Colorado residents who have survived traumatic brain injuries (TBI). This statute created the Colorado TBI Trust Fund (Trust Fund) to finance program activities, and the Trust Fund Board to advise the Program on operations of the Trust Fund. The board is administered within the Colorado Department of Human Services (CDHS). Three board members are designated in statute and 10 members are appointed by the Governor with the consent of the Senate. The Board has established three ongoing committees to assist staff in policy-setting of program goals and strategic planning for the Trust Fund: Program Evaluation and Research; Revenue; and Vision and Outreach.

Revenue/Expenditures:

During the reporting period of July 2013– June 2014, the Trust Fund received \$2,200,576. The Trust Fund expended \$1,921,288. The Brain Injury Program has a spending authority of \$3,321,588. Colorado Brain Injury Program received \$279,288 above last year's total revenue of \$2,075,353. Unexpended revenue goes into a reserve fund. It is important to maintain a reserve fund to help cover expenses when our revenue is less than anticipated. The current reserve fund is \$680,984.

Funds are divided across program areas with the following percentages: 55% for services, 25% for research, and 5% for education. This leaves 15% of funds flexible so that the Program Director and Board of Directors can determine which program area requires an increase in percent of funds each year. In FY 2014, funds were distributed according to a statutory formula. Five percent of the funding increase for 2014 went toward education, 60% to research and 35% to services.

Services:

During FY 2014, 211 adults applied for services with two hundred adults being referred for case management services during the fiscal year. Eight hundred and ninety-eight adults received care coordination services. A total of 92 children/youth were served during FY 2013-14.

Research:

During the period from July 2013 – June 2014, two research grants were completed, two remain active and one new grant was funded. Expenditure on the five research grants totaled \$551,758 for FY 2013-14.

Education:

During FY 2013-14, the program did not award any education grants. This was largely due to the revenue short-fall from the previous fiscal year. Instead, the program maximized services through accessing five percent of the trust fund revenue to pay the adult and children's program contractors to provide specific education to clients and families. As a result, 39 unique classes/workshops were offered across the state for clients and families.

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Program Overview

The Colorado Brain Injury Program was created by Title 26, Article 1, Part 3 of the Colorado Revised Statutes, to improve the lives of Colorado residents who have survived traumatic brain injuries (TBI). This statute created the Colorado TBI Trust Fund (Trust Fund) to finance program activities, and the Trust Fund Board to advise the Program on operations of the Trust Fund. The board is administered within the Colorado Department of Human Services (CDHS). Three board members are designated in statute and 10 members are appointed by the Governor with the consent of the Senate. Please see below for a list of board members. The Board has established three ongoing committees to assist staff in policy-setting of program goals and strategic planning for the Trust Fund: Program Evaluation and Research, Revenue, and Vision and Outreach.

Trust Fund Board of Directors

Name	Employment/Affiliation
Deborah Boyle	Douglas County Sherriff's Office
Susan Charlifue, PhD	Craig Hospital
Jeffery Cuthbert, PhD	Craig Hospital
Indira Gujral	Colorado Department of Public Health and Environment
Sena Harjo	Clayton Early Learning Center
Timothy Hurtado, MD	Penrose Hospital
Catharine Johnston-Brooks, PhD	Denver Veterans Affairs Medical Center
Helen Morgan	Denver District Court
Rhesia-Maria Ochoa	University of Denver, Graduate Student
James Pinkney	Denver County Jail (internship)
Dannis Schanel	Brain Injury Alliance of Colorado
Laetitia Thompson, PhD	University of Colorado School of Medicine
Vacant	Colorado Department of Human Services (pending approval)

Colorado Brain Injury Program Operations

Program Administration

CDHS administers the Brain Injury Program which is housed within the Division of Vocational Rehabilitation (DVR). DVR provides highly supportive and complementary services to emphasize independence. Its programs include rehabilitation services, training, and vocational guidance and counseling for individuals with disabilities. CDHS staff work closely with the Trust Fund Board and perform the following functions for the program: financial management, policy development, program development and implementation, contract management, program

monitoring, administrative support, website maintenance, public assistance and information, reporting, marketing and public relations.

Program Services Overview:

Youth Brain Injury Connections:

During FY 2012- 13, important changes were made to the children/youth program. In 2011, the Program entered into an Inter-agency Agreement with the Colorado Department of Education (CDE) to manage the children's program, Youth Brain Injury Connections (YBIC). This partnership was enhanced in FY 2013-14. There are now 1.5 FTE dedicated to brain injury at CDE. Funding for these positions represents a true inter-agency partnership and a creative blended funding effort. Money from the Trust Fund supports 1.0 FTE Brain Injury Health Consultant, .5 Statewide Brain Injury Liaison and the subsequent operational costs associated with these FTE. These individuals sit within the Health and Wellness Unit at CDE.

In addition, there is a 1.0 FTE Brain Injury Education Consultant that sits within the Special Education Unit at CDE. This individual is partially funded (.5 FTE) through a Federal Health and Human Services, Health Resource Services Administration grant that was awarded to the Brain Injury Program in 2010. The other half of the FTE funding is supported with dollars from special education through CDE to focus on Fetal Alcohol Syndrome. CDE has agreed to fund this position in whole when the grant is completed in FY 2016. The CDE consultant's scope of work includes managing referrals through the YBIC, providing education consultation and technical assistance to the school districts, and building capacity of schools and other providers to better meet the needs of children and youth with a brain injury. The Statewide Brain Injury liaison is responsible for providing education consultation support to all children/youth and families referred for support through YBIC.

The YBIC provides care coordination support in addition to education. This function has been supported through a partnership with the Health Care Program for Children with Special Needs offices, located in local county public health agencies. The Program leverages existing infrastructure to provide care coordination for children/youth with a brain injury at no cost to the Trust Fund. These services are funded by Title V funds from the Social Security Act. The Brain Injury Program provides support to care coordinators through training regarding brain injury and technical assistance support regarding serving these children/youth. Additionally, the Brain Injury Program continues to partner with the Colorado Department of Public Health and Environment (CDPHE) to maintain the care coordination infrastructure and to collect data related to children served through care coordination.

Adult Brain Injury Program:

During FY 2013-14 the following enhancements were made to the Adult Brain Injury Program:

1. Applicants meet face-to-face with a care coordinator in their own community within 45 days of acceptance into the program.
2. Program participants have access to care coordinators via drop-in centers within their region on a monthly basis.
3. Program participants have access to the level of care coordination that meets their specific needs including intensive one-to-one care coordination support as needed.
4. Services are available for a two year period with the option to reapply as necessary.
5. Enhanced classes and workshops regarding brain injury for program participants and family members.

The aim of the Adult Brain Injury Program is to increase self-sufficiency and to create a safety net for those who require on-going support. This approach to case management should provide program participants with the supports necessary to more fully re-integrate into their communities.

Revenue and Expenditures

Through the TBI Trust Fund, the Brain Injury Program receives revenue from surcharges assessed for convictions of driving under the influence of drugs or alcohol (DUI) or driving while ability is impaired (DWAI), speeding, and youth under 18 years of age riding a motorcycle or motorized bicycle without a helmet. The surcharges are \$20.00 for DUI/DWAI convictions, and \$15.00 for speeding and helmet convictions.

Funds are divided across program areas with the following percentages: 55% for services, 25% for research, and 5% for education. This leaves 15% of funds flexible so that the Program Director and Board of Directors can determine which program area requires an increase in percent of funds each year.

During July 2013–June 2014 period, the Trust Fund received \$2,200,576, and expended \$1,921,288. The Brain Injury Program has a spending authority of \$3,321,588. The Program received \$125,222 above last year's total revenue of \$2,075,354. Unexpended revenue goes into a reserve fund. It is important to maintain a reserve fund to help cover expenses when our revenue is less than anticipated. The current reserve fund is \$680,984.

Due to the need to ensure fund solvency, program staff and the Board have begun to explore additional funding to help support program activities. It is outlined in statute that, in addition to surcharges, the Program can accept gifts, grants and donations. During fiscal year 2013-14, the Program submitted two grant proposals. Each grant was awarded funding.

The Brain Injury Program received a grant from the CDHS, Office of Behavioral Health (OBH), to begin in July 2014. This is a two and a half-year grant. In each of the first two years, the Program will receive \$90,850. The third year is six months and will be funded at \$45,425. This grant represents a partnership between the Brain Injury Program; Denver Juvenile Probation; Denver County Jail Transition Unit; the University of Denver (DU); and the University of Colorado (CU) Anschutz Medical School.

The primary objectives of this grant are to screen for a life time history of brain injury, assess for on-going impairment, provide psycho-social education for justice-involved individuals identified with brain injury as well as provide resources for support related to their brain injury.

Additionally, the Brain Injury Program received a US Department of Health and Human Services, Health Resources and Services Administration (HRSA), TBI Implementation four-year grant award. This grant began June 2014 and will end May 31, 2018. Project funding will be \$250,000 each year of the four-years grant.

This grant has a similar focus as the grant from OBH, however is much larger in scope. The HRSA grant focuses on the following target populations: inmates from Boulder, Denver (RISE unit) and Larimer County Jails; individuals involved in the Denver District Problem Solving Courts; Denver Juvenile Probation; and youth incarcerated within six target Division of Youth Corrections sites across the state.

There are four primary initiatives of this grant: screening, identification and assessment of brain injury; education and capacity building for corrections and mental health staff and psycho-education for those identified; information and referral for justice-involved individuals; and case management support for these individuals.

To implement the goals and objectives of this project, the Brain Injury Program will be partnering with: Brain Injury Alliance of Colorado; Rocky Mountain Human Services; CDE; DU; CU; and a contract evaluator.

These grants enable the program to address the needs of a population that has been traditionally underserved. These services can decrease incarceration for those who have not yet been sentenced, and decrease recidivism for those who have been incarcerated. Through these grants the Program is projected to save the TBI Trust fund \$31,055 in the first two years, \$22,143 in year three, and \$13,228 in year four in personnel cost and increased staffing at BIAC, RMHS and CDE by approximately 2.5 FTE.

Services

All individuals receiving assistance from the Brain Injury Program receive case management/care coordination services (these terms are used interchangeably). Care coordination is designed to provide clients with skills they can use throughout their lifetime and to connect clients with resources in their communities following their participation in the program. Additionally, the Adult Brain Injury Program provides community drop in hours and classes and workshops for survivors and families in an effort to improve life and advocacy skills. Youth accessing Youth Brain Injury Connections (YBIC) are provided with education linkage support in addition to care coordination. The goal is to develop a comprehensive safety net to support families as they navigate complex medical, community and educational systems.

Services Provided During the Reporting Period of July 1, 2013 – June 30, 2014

Colorado Adult Brain Injury Program, Clients Served:

The Brain Injury Program contracts with the Brain Injury Alliance of Colorado to conduct intake and eligibility for the program. Once approved for services, the individual is referred to RMHS for case management. During FY 2014, 211 adults applied for services with 200 adults being referred for case management services during the fiscal year. The remaining 11 clients were in-process of an eligibility determination at the end of the fiscal year. Rocky Mountain Human Services is contracted to provide case management, community drop in support and classes and workshops. Eight Hundred and Ninety-Eight adults received care coordination services. There is no longer a waitlist for accessing support, however, there is a waitlist for individualized case management. Individuals waited an average of 60 days to be assigned an individualized Brain Injury Support Specialist (BISS) for intensive case management. While waiting for intensive case management support, individuals have access to information and referral. One hundred and thirteen individuals were on the wait list for intensive case management, but received information and referral. Individuals on the waitlist had access to information and resource from a BISS, community drop in hours, and classes and workshops.

Colorado Youth Brain Injury Connections

The Program contracts with BIAC to manage the referral process for youth being referred to Youth Brain Injury Connections. When the referral is received, BIAC sends this referral to CDE

CDE contacts the Local Public Health Agency and Health Care Provider with the referral information for the child/family to receive care coordination. A total of 92 children/youth were served during FY 2013-14.

Evaluation:

The Brain Injury Program Director, the Board of Directors, Program Evaluation and Research work groups, with support of the CDPHE Epidemiology and Program Evaluation Unit, has designed a comprehensive evaluation plan for the adult program, and is in the process of developing a plan for the youth program which will be implemented in FY 2014-15. This process included development of a logic model, evaluation plan and action plan. Each phase included stakeholder and contractor input.

Outreach:

The Brain Injury Program contracts with BIAC to provide outreach for all aspects of the Trust Fund. During the reporting period of July 2013– June 2014, the Outreach Coordinator focused efforts on reaching out to hospitals, attending conferences across the state and attending events such as health fairs. Outreach efforts included the following:

- Outreach at 15 hospitals - Craig Hospital, St. Anthony's – Central and Summit, Swedish, Children's, Medical Center of Aurora, Penrose, University, Denver Health, Northern Colorado Rehab, HealthSouth, Memorial, St. Mary's in Grand, Community Hospitals in Grand Junction.
- Outreach at statewide regional brain injury conferences - Breckenridge, Colorado Springs, Pueblo, Gunnison, Boulder.
- Other conferences: Breckenridge – Behavioral Healthcare Council Annual Conference; Denver – Translational Neuroscience and Educator's Conference; Denver – Adolescent Health Conference; Westminster – Collaborative Justice Conference; Aurora – Community and School Pediatric Health Conference.
- Outreach/Education/Training Events with community organizations - Alliance for Healthy Aging; National Association of Social Workers; the Gathering Place; Joining Community Forces (military & veteran network); Catholic Charities; Victim's Advocates; North Metro Community Services; Community Reach Center; Center for People with Disabilities; PEAK Vista; Colorado Guardianship Alliance; Colorado Access; Colorado Neurological Institute; PATH; Safehouse Progressive Alliance for Nonviolence; Boulder County Jail; PeopleCare Health Services; Domestic Violence Offender Management Board; Peer Assist; and Jefferson Center for Mental Health .
- Initiated five new support groups - Denver area caregiver support group; Colorado Springs parent support group; Steamboat Springs brain injury support group; Fort Collins brain injury support group; Montrose brain injury support group.
- Attended 13 Health Fairs (for youth and adults), multiple monthly brain injury professional networks and support group meetings (Boulder, Colorado Springs, Denver, Fort Collins, Grand Junction).

Research

The Brain Injury Program awards grants to support research in Colorado related to the treatment and understanding of traumatic brain injuries. The Research Program has established the following three research priorities: basic science, clinical science and health services and outcome research. Research is funded at three levels: Type I (up to \$50,000/year

for two years), Type II (up to \$150,000/year for two years) and Type III (up to \$250,000/year for five years).

During the period of July 2013 – June 2014, two research grants were completed, two remain active and one new grant was funded. Expenditure on the five research grants totaled \$551,758 for FY 2013-14. The research grants funded are summarized below.

Title: *“Improving the Mental Health Outcomes of Child Brain Injury in Colorado”*

Principal Investigator: Michael Kirkwood, PhD

Institution: The Children’s Hospital, Denver

Award: \$637,520

Status: Four year project ended FY 2013-14

Description: This study seeks to compare the efficacy of Counselor-Assisted Problem Solving (CAPS) versus Internet Resources (IRC) for families following pediatric TBI. CAPS addresses cognitive appraisals, behavior management, problem-solving skills, and family communication through a skill-building website coupled with synchronous 1:1 video conference sessions with a therapist. In contrast, IRC provides families with access to online TBI education and resources. CAPS reflects an innovative integration of cognitive-behavioral theory, efficacious treatment strategies and the emerging technology of the World Wide Web. Allowing families in both groups to access help online has the potential to significantly reduce both physical and psychological barriers to care.

This project provided critical information about: 1) the efficacy of online interventions following TBI; and 2) the types of families and children most likely to benefit from this type of approach. The investigation represents the logical continuation of previous work developing and testing theoretically-grounded interventions for pediatric TBI. It laid the foundation for subsequent investigations of the effectiveness of this approach when translated to clinical settings. The results from the project provided knowledge, skills, and support to families of children with TBI throughout the state of Colorado, as well as the country, at a relatively low cost. The findings and methodology also have broad applicability to other groups of children with chronic medical and neurological conditions.

Title: *“The Role of Natural Antibodies in Pathophysiology of TBI”*

Principal Investigator: Philip F. Stahel, MD

Institution: Denver Health Medical Center, University of Colorado School of Medicine

Award: \$1,024,753

Status: Five year active project will end FY 2014-15.

Description: The initial goal of the proposed study is to evaluate the role of natural antibodies on the secondary neuroinflammatory response following TBI. As natural antibodies are a relatively new area of inflammation research, researchers are just beginning to understand their intricate and complex mechanisms of interaction with neoantigens exposed after trauma. An intimate and more sophisticated understanding of natural antibodies and their roles in the neuroinflammatory response after head injury is a prerequisite for a future successful “bench-to bedside” translation of basic research into therapeutic modalities.

This project is ultimately aimed at a long-term “bench-to bedside” transfer of insights from experimental models into new therapeutic modalities for reducing the extent of secondary brain damage and attenuating the overall mortality and long-term neurological morbidity in patients suffering from TBI. Excessive local complement activation in the CNS may be triggered by natural antibody-neoantigen interactions. Thus, experimental pharmacological blockade using novel CR2-chimeric molecules may represent a “cutting-edge” approach to inhibit

complement-mediated local brain tissue damage resulting from natural antibody-induced activation of the 18 complement cascade. This therapeutic approach may limit the inflammatory downstream events prompted by natural antibodies with amelioration of secondary brain injury. Should this approach be successful, pharmacological blockade of natural antibodies or utilization of CR2-chimeric molecules may represent a therapeutic option to be tested in clinical trials in the long term.

Title: *“Neuroendocrine Dysfunction in Traumatic Brain Injury: Effects of Testosterone Therapy”*

Principal Investigator: David L. Ripley, MD, MS, CRC, FAAPM&R

Institution: CNS Medical Group, Craig Hospital

Award: \$1,468,582

Status: Project initially funded for five years, at the researcher’s request, was modified to a four year grant. This grant was completed at the end of FY 2013-14

Description: Neuroendocrine dysfunction following traumatic brain injury (TBI) has recently been an area of significant investigation. As many as 80% of men with severe TBI experience low testosterone (T) levels, or *hypogonadism*, following injury. Testosterone therapy has been shown to be effective in improving strength, cognition, and function in hypogonadal men, although this has yet to be evaluated in hypogonadal men with TBI. This study assessed the hormonal status of men on admission to an inpatient TBI rehabilitation program. Individuals with low T levels were randomized to receive either physiologic T therapy or placebo. Individuals with sufficient levels of T were followed as a second control group. All three groups underwent serial assessment of neurological function and functional independence to correlate with hormone levels. These findings have direct impact on optimizing the rehabilitation of individuals with TBI.

Title: *“Developing Novel FLAP Inhibitors for Use in TBI”*

Principal Investigator: Kim A. Heidenreich, PhD

Institution: Department of Pharmacology, UC Denver, Anschutz Medical Center

Award: \$ 375,000

Status: Three year active project will end FY14-2015

Description: About 1.7 million American civilians each year suffer a TBI from motor vehicle accidents, falls, and sports injuries. The military estimates that as of 2008 more than 320,000 soldiers have returned from Iraq and Afghanistan with TBI largely from increased exposure to blasts. Neurological damage resulting from a TBI does not all occur immediately at the moment of impact (primary injury) but evolves afterwards (secondary injury). Secondary brain injury is the leading cause of hospital deaths after TBI. Most secondary brain injury is caused by brain swelling and if unchecked swelling can lead to increased intracranial pressure, cerebral herniation, enhanced morbidity, and possibly death. Using an experimental model of TBI, the PI and collaborators have shown that pharmacological administration of MK-886, a FLAP inhibitor previously developed for asthma, before or immediately after TBI blocks the production of lipid mediators that cause brain swelling after TBI. The early blockade of swelling by MK-886 is associated with less cell death and subsequent neurological impairment. The aims of the current proposal are to develop FLAP inhibitors that can be evaluated in human studies to treat TBI in both prophylactic and acute settings.

Title: *“Identifying TBI in school children: A Case Study of the Educational Identification of TBI Process in Colorado”*

Principal Investigator: Pat Sample, PhD

Institution: Colorado State University, Occupational Therapy Department

Award: \$281,250

Status: This grant was awarded in FY 2012-13 but due to funding did not begin until December of FY 2013-14. This grant will end FY 2015-16.

This exploratory study will investigate the earliest stages of a newly-broadened, school-based student TBI identification process in Colorado (ED-ID), which has been developed with the express purpose of increasing the level of support for students with a possible TBI that has not previously been medically diagnosed. The outcomes for newly-identified students, combined with the lessons learned by the Colorado Department of Education, and Colorado schools, will mark an opportunity for Colorado to change teaching and learning processes to benefit previously un- or misidentified students. Well-tuned educational identification of TBI in students will facilitate focused and appropriate supports for their TBI-related school problems. The project will weave together information from the State, district, school, and even individual student/family levels, related to the change in the TBI identification process. The more we can understand the efficacy of TBI identification protocols in Colorado schools, and the more we learn about new methods to identify students with TBI who need unique supports to succeed in school, the more we can improve outcomes for those students.

The Colorado Brain Injury Program did not release a competitive request for proposals (RFP) in FY 2013-14. The program will release an RFP during FY 2014-15 with funding to begin FY 2015-16.

Education

The Brain Injury Education Program provides education across Colorado about TBI with the goal to prevent brain injury and increase access to appropriate and effective services and supports for those with a brain injury. Historically, the program awards competitive Education Grants with a maximum award amount of \$10,000.

During FY 2013-14, the program did not award any education grants. Instead, the program maximized the education program by accessing 5% of the trust fund revenue to pay the adult and children's program contractors to provide specific education to our clients and families. As a result, 39 unique classes/workshops were offered across the state for clients and families. Topics included: life skills, therapy groups, support groups, peer-mentoring, financial management, social groups, intimacy, recreation and family education. Additionally, in March, the Program hosted a webinar on managing anger/aggression which reached eight different communities and 119 individuals. This webinar was a part of Brain Injury Awareness Month activities.

The Program is working to revise the education grant process to make it more efficient and effective and plans to award grants again in FY 2014-15.