

**MINDSOURCE – Brain Injury Network  
Report to the Joint Budget Committee and  
Health and Human Services Committees  
July 1, 2019 – June 30, 2020**

**Program Overview**

MINDSOURCE – Brain Injury Network (MINDSOURCE), formerly 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 Traumatic Brain Injury Trust Fund (Trust Fund) to finance program activities and the Trust Fund Board to advise the program on Trust Fund operations. MINDSOURCE and the board are 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**

<b>Name</b>	<b>Employment/Affiliation</b>
Jennifer Coker	Craig Hospital
Theresa Chase, PhD	Colorado Mesa University
Cheryl Catsoulis	Brain Injury Alliance of Colorado (BIAC)
Dawn Comstock, PhD	University of Colorado, School of Public Health
Jason Kacmarski, PhD	Rocky Mountain Regional VA Medical Center
Angie Wickersham	Hilltop Life Adjustment Program
Thomas McCause	Mesa County Valley School District 51
Danny Mistry, MD	Western Orthopedics & Sports Medicine, P.C.
Latoya Mize	Denver District Attorney’s Office
Jennie Munthali, MPH	Colorado Department of Public Health and Environment
Victoria Ortega	City and County of Denver
Gretchen Russo, RN, BSN, JD	Colorado Department of Human Services
Kenneth Scott, PhD	Denver Public Health

**Program Administration**

CDHS administers MINDSOURCE, which is housed within the Office of Adult, Aging, and Disability Services. MINDSOURCE staff work closely with the Trust Fund Board to 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.

**Revenue and Expenditures**

Through the Trust Fund, MINDSOURCE receives revenue from surcharges assessed for convictions of driving under the influence of drugs or alcohol (DUI), driving while ability is impaired (DWAI), speeding, and riding a motorcycle or motorized bicycle without a helmet (for youth under the age of 18).

HB19-1147 changed the surcharge structure for the Trust Fund and added general funds to the line item that funds MINDSOURCE. Beginning in August 2019 the surcharges across traffic violations increased by \$5.00 each (e.g. DUI/DWAI changed from \$20.00 to \$25.00). Additionally, HB19-1147 eliminated the

voluntary municipal speeding surcharge. Finally, the statute included an appropriation of \$450,000 from the state general fund for FY 2019-20.

The spending authority for the Long Bill line item for MINDSOURCE was \$3,200,000 for Fiscal Year 2019-20. The Trust Fund received \$1,636,690 in revenue along with \$450,000 in General Funds. The program expended \$2,437,853 for FY 19-20.

**Funding Expenditures for FY20**

Services	Research Grants	Community Grants
\$1,645,107	\$660,136	\$132,610

**Services**

Every five years MINDSOURCE issues a competitive request for proposals for an entity to provide outreach, intake and eligibility, case management services (including resource navigation and self-management), and education consultation (for youth 0-21). The Department currently contracts with the Brain Injury Alliance of Colorado (BIAC) for these services. In addition, MINDSOURCE has an interagency agreement with the Colorado Department of Education (CDE). The focus of the CDE interagency agreement is to build the capacity of school and community providers to better support and serve children/youth with brain injury.

**BIAC Services**

During FY 2019-20, 969 adults and 72 youth received support from BIAC services as described below:

- **Resource Navigation** is intended to be a quick and responsive support. This can be provided via phone, email, or in person.
  - Examples of resource navigation include, but are not limited to: finding medical providers, completing paper work, securing benefits, understanding brain injury, and connecting to community resources.
- **Self-management/Skill-building** is a program designed and available for survivors of TBI who want to invest time in improving their skills in specific areas that can be challenging after a brain injury.
  - Participants meet with their Brain Injury Advisor for an average of 4 hours per month to work on skill-building.
  - Areas of focus for self-management include: communication, scheduling/planning, and prioritization/organizing.
  - Participants have regular homework outside of meetings with their Advisor which are reviewed each time they meet.
  - BIAC Advisors work one-on-one with each participant to assess their strengths and weaknesses, identify natural supports in their life, and develop strategies for building specific skills with the goal of greater self-sufficiency.
- **Youth Education Consultation.** After a brain injury, children and youth may have challenges in the classroom and their families may need support navigating the education system. BIAC has a Youth Education Liaison specialist on staff that provides consultation and support services to children and youth, ages 0-21.
  - Consultation and support may include, but are not limited to, the following: providing parent/guardian education about services and programming options available in schools, assisting in the partnership between parents and schools, educating parents and school teams on how a student has been impacted by their brain injury, collaborating with schools on intervention planning, attending transition, individual education plan, multi-tier support systems, and other planning meetings, partnering with hospitals to help with transition to school, and any other student specific educational needs/concerns/questions.

- **Classes and Workshops.** BIAAC offered 121 classes in a variety of locations across the state. The classes combined total of attendance at the classes and workshops was 297.
  - Classes and workshops range in topics. FY 2019-20 topics included: adaptive aquatic, adaptive yoga, art classes for both youth and adults, assistive technology basics, brain injury basics, cooking, education workshop for youth and families, energy conservation, financial health, financial literacy, grief and loss, improvisational, Medicare 101, music therapy, needlework, neuropsychology 101, Parent Workshop, poetry, Public Safety, smart shopping, and the mindful brain.
  - Classes and workshops were either held remotely for statewide participation or in the following counties:
    - Denver
    - Garfield
    - El Paso
    - Jefferson
    - Larimer
    - Routt

As indicated previously, MINDSOURCE has an interagency agreement with CDE. The focus of the CDE interagency agreement is to build the capacity of school and community providers to better support and serve children/youth with brain injury. CDE has been involved in many activities this year including:

- Training of BrainSTEPS CO brain injury consulting teams to support youth moderate to severe acquired brain injury, as well as those with protracted recovery from concussion. During FY 20 CDE hosted a two-day BrainSTEPS CO New Team/New Team Member training and a one-day Up-Date Training (for all BrainSTEPS CO members). Currently 21 school districts and five Boards of Cooperative Education Services (BOCES) have BrainSTEPS teams (covering approximately 75-80% of the Colorado student population).
- Training Return to Learn Concussion Management Teams (CMTs) in schools throughout the state via the BrainSTEPS CO online Return to Return to Learn CMT training course. 173 schools in Colorado have Return to Learn CMTs and 389 school personnel have taken the Return to Learn CMT training.
- Holding monthly Return to Learn CMT Community of Practice (CoP) online webinars/meetings for individuals who have completed the CMT training to keep their knowledge up to date.
- Holding bi-monthly Concussion Action Team (CAT) webinars/meetings to keep districts up to date on concussion information.
- Holding monthly teleconference calls with BrainSTEPS CO Team Leaders to disseminate information and answer questions.
- Supporting BrainSTEPS CO team members through consultation and mentoring.
- Providing consultation to school personnel and parents with questions regarding brain injury.
- Managing the TBI and CAT (concussion) listservs, disseminating information on a regular basis.
- Disseminating brain injury information at state-wide conferences and professional meetings.

### **Outreach**

MINDSOURCE contracts with BIAAC to provide training and outreach. During FY 2019-20, BIAAC coordinated 174 outreach and training activities with approximately 2,080 attendees. The following is the breakdown of location for those outreach efforts:

- 64% in Denver Metro
- 11% in Southern CO
- 8% in Northern CO
- 7% in Western CO
- 5% Statewide

Outreach typically consists of meeting with community providers to share information about services and to encourage referrals to brain injury supports and services. BIAC collects pre and post data about their educational trainings to better understand effectiveness. During this reporting period:

- 42% learned about BIAC for the first time when receiving training from BIAC
- 92% Strongly Agreed or Agreed that they have a better understanding of what a brain injury is following training by BIAC
- 95% Strongly Agreed or Agreed that their understanding of how to support individuals with brain injury increased following a training by BIAC

### **Research**

MINDSOURCE 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 two levels: Type I (up to \$50,000/year for two years) and Type II (up to \$150,000/year for two years).

During FY 2019-20 MINDSOURCE had six active research grant projects. One of the six requested and was granted a no-cost extension. An RFP for new awards was issued, followed by independent and panel reviews, with five awardees. Three of these grants are clinical science, one is basic science, and one is a new investigator award.

**Title:** *“Hypocretin Replacement as a Countermeasure for Sleep-Wake Disturbances in a Mouse Model of Traumatic Brain Injury”*

**Principal Investigator:** Mark Opp

**Institution:** University of Colorado, Boulder

**Progress:** The effects of traumatic brain injury persist far longer than just the acute, post-injury period. Individuals suffering TBI often complain of disrupted sleep, which effects cognitive performance and mood, among other symptoms. These symptoms may persist for years or decades. This project tests the hypothesis that replacement of a key brain chemical will alleviate post-TBI sleep disturbances. During the first year of funding from MINDSOURCE, the team collected tissue from 55 experimental mice to determine effects of TBI on the brain cells that contain brain chemical in which they are interested. Approximately 50% of the tissue we collected was processed before research halted in response to COVID-19. They anticipate returning to (limited) research in the very near future, and will continue processing these samples. Once tissue processing is complete, they will have a good assessment of TBI on these types of brain cells, and will then proceed to the next phase of the study.

**Title:** *“Initiation of an Early Exercise Program to Improve Symptoms and Psychosocial Function after Pediatric Mild Traumatic Brain Injury”*

**Principal Investigator:** David Howell

**Institution:** Children’s Hospital Colorado

**Progress:** The team has begun enrolling participants in a randomized clinical trial investigating the effect of early sub-symptom aerobic exercise on psychosocial outcomes, and monitoring participants for the subsequent two months. Data thus far indicates a beneficial effect of early exercise on persistent post-concussion symptoms and anxiety, relative to standard-of-care. However, these data are preliminary and the team requires an additional year of participant enrollment and data collection to ensure the study aims are achieved, and they are appropriately powered to disseminate any of our findings. Given the restrictions to in-person clinical research imposed due to the COVID-19 pandemic, they have begun implementing methods to switch to remote/telehealth examinations when possible, and to ensure social distancing and reductions in person-to-person contact when this is necessary. Upon re-activation authorization, they will continue to enroll, but only perform necessary in-person assessments (e.g. aerobic exercise testing) in a safe manner (social distancing, no patient overlap, appropriate personal protective

equipment), while all other assessments (e.g. questionnaires) along with the informed consent procedures will be performed remotely.

**Title:** *“Machine Learning and Cytotoxic Edema in Abusive Head Trauma”*

**Principal Investigator:** Daniel Lindberg

**Institution:** University of Colorado

**Progress:** The core objective of this project is to improve care of children with traumatic brain injury and concern for abuse by using machine learning to recognize new patterns of brain injury that are associated with abuse and with poor outcomes. The team has developed cutting-edge MRI-based imaging methods, and are well-suited to identify new patterns of brain injury that can be used to improve diagnosis and predictions for clinical care. The core methods of this project are to combine clinical and imaging data for approximately 500 children with severe brain injury, and to use traditional and machine-learning analysis to identify characteristics associated with abuse and with poor outcomes. In the first year, they have accomplished the clinical objectives ahead of schedule. Having planned to collect data on approximately 250 eligible subjects, they now anticipate complete data collection on nearly 500 subjects. They obtained Institutional Review Board approval ahead of schedule and have added all new investigators to the research team. Though they were unexpectedly faced with the loss of our statistical and machine-learning partners, they were able to establish improved partnerships within the University, including a new partnership with Terri Lewis, another MINDSOURCE investigator. They have identified imaging studies for the nearly 500 participants, and have established a confidential imaging export protocol, and processes to compare studies across age and size. They anticipate beginning core machine-learning analyses early in the second year of the project. The work has been largely unaffected by the COVID pandemic, and they are able to continue all research activities despite a shutdown of the Anschutz Medical Campus.

**Title:** *“Intimate Partner Abuse and Traumatic Brain Injury”*

**Principal Investigator:** Anne DePrince, PhD

**Institution:** University of Denver

**Progress:** Despite domestic violence often involving physical blows, remarkably little is known about traumatic brain injury (TBI) among victims and survivors as well as the impact of TBI on health service need and use. To address this urgent gap, this project enrolls women seeking services for domestic violence at the Rose Amond Center into a two-session study; they have enrolled 43 women to date. Among the first 33 women interviewed, nearly all (94%) reported at least one head injury from an external blow to the head; and most women (64%) reported a period of time when they sustained multiple head injuries in a row, often due to abuse. Women reported an average of five current post-concussive symptoms (e.g., memory problems, concentration problems, headaches). Women reported significant health problems, including an average of more than eight physical health symptoms in the past year; half of women indicated limitations during moderate activities (e.g., cleaning, exercise) and 60% said they had limitations climbing several flights of stairs.

**Title:** *“Microbiome, Inflammation, and Gut Permeability: The Onset of Psychiatric Conditions Among Those with Acute mTBI”*

**Principal Investigator:** Lisa Brenner

**Institution:** University of Colorado

**Progress:** This project aims to explore impact of acute mTBI on the human microbiome and the effects of the human microbiome on mental health outcomes post-injury. Since the start of this longitudinal study, regulatory approval has been obtained and study personnel were hired and trained. Nine participants have been recruited. Initial samples at baseline were obtained and ongoing data collection has been initiated. During the pause of recruitment due to COVID-19, follow-up data collection has continued for those previously enrolled in the study.

**Title:** *“A Longitudinal, Multi-Dimensional Assessment of Recovery and Added Benefit of a Behavioral Health Intervention for Children with Abusive Head Trauma”*

**Principal Investigator:** Terri Hoar Lewis, Ph.D.

**Institution:** University of Colorado, Denver

**Progress:** This project began July 1, 2017, was granted a no-cost extension and will end June 30, 2020. Recruitment for participants continued from July 1, 2019 and discontinued January 1, 2020 due to the longitudinal nature of the study and intervention period. Between July 1, 2019 and December 31, 2019, there were 18 new admissions to the NABICC clinic. Of those, 14 were ineligible for participation due to study exclusions (age, geographic area, non-English speaking). Two were approached but decline participation, one was discharged before approached for consent, and one family was consented into the study. They completed the 12-month data collection interview for two families. One family is still in the data collection phase. All study measures were scored. Descriptive analyses were initiated and algorithms to code injury severity are underway.

### **Community Grants**

MINDSOURCE awards community projects to promote the awareness and education of brain injury. During Fiscal Year 19-20, 14 community projects received funding. Grants range in amounts from \$5,000 to \$20,000 and can be for a period of one or two years with a maximum of \$10,000/year. The following entities were awarded grants:

- Helmet Heads
- Pueblo Brain Injury
- Domestic Violence Initiative
- Centennial BOCES
- Craig Hospital
- Brain Injury Alliance of Colorado
- Brain Injury Hope Foundation
- Pueblo School District
- Western Colorado Area Health Education Center
- Spring Institute for Intercultural Learning
- Montrose County School District

No RFP was issued during FY 2018-19 due to decreased revenue.

Finally, the program partners with CDHS Offices, Divisions and Programs as well as other state agencies by providing training on identification of brain injury and guidance for supporting individuals with brain injury in their respective systems to help them achieve greater outcomes.