The Texas Brain Injury Advisory Council FY21-22 Report Presented to the Texas Legislature

As Required by

1TAC Part 15, §351.825(d)(2)

and Texas Government Code

§531.012

Texas Brain Injury Advisory Council

December 2022

Contents

Disclaimer

This report was prepared by members of the Texas Brain Injury Advisory Council. The opinions and recommendations expressed in this report are the members' own and do not reflect the views of the Texas Health and Human Services Commission Executive Council or the Texas Health and Human Services Commission.

Executive Summary

Brain injury is a global health concern. An acquired brain injury may be either traumatic or non-traumatic. Traumatic brain injury implies an external force either direct or indirect causing damage to the brain or disruption of neurologic function. Unlike traumatic brain injuries, non-traumatic brain injuries do not involve external forces and can be caused by internal factors such as vascular issue, mass, or tumor. Acquired brain injury can affect individuals in a variety of ways which include their biopsychosocial functioning.

The impact of acquired brain injury is great. The incidence of acquired brain injury is challenging to fully determine. Current estimates suggest that 2.87 million individuals in the United States. are treated for brain injuries per year. Non-traumatic injuries such as stroke occur at a rate of 795,000 however, the incidence is likely to be higher give that individuals sometimes do not seek medical care for these problems. Acquired brain injury is the leading cause of long-term disability in the Unites States. It is estimated that per annum, healthcare costs of non-fatal TBI are over $40 billion in the United States. For additional details, please see below.

Legislative Recommendations

- Add cognitive rehabilitation therapy to the Texas Medicaid plan.
- Recommend expanding the Comprehensive Rehabilitation Services program eligibility criteria to include services for individuals who have suffered a non-traumatic brain injury.
- Provide permanent and sufficient funding for the Comprehensive Rehabilitation Services program with goal of enhancing access to services.
- Recommend that Texas adopt a universal motorcyclist helmet law Evaluate other states' brain injury programs for best practices, including public education for Texans with Acquired Brain Injury (ABI).
- Evaluate other states' brain injury programs for best practices, including public education for Texans with Acquired Brain Injury.
- Evaluate and develop a system to ensure ABI data is collected if ABI is not listed as a primary diagnosis that measures long-term outcomes based on certain parameters such as age, county of residence, racial/ethnic identity, and access to care.

- Add non-traumatic brain injuries to the Emergency Medical System and Trauma Registry (EMS/TR) maintained by the Department of State Health Services.

Non-Legislative Recommendations

- Research and develop a Peer to Peer Brain Injury Support Program that serves and meets the needs of survivors, and possibly even care-partners, in each various communities or areas.
- Collaborate with the Office of Acquired Brain Injury on current and future projects.
- Provide support for the strengthening of partnerships and communication with state agencies as well as other state and national brain injury organizations.

Background

What is the Texas Brain Injury Advisory Council?

In 2003, the 78th Texas Legislature established the Texas Traumatic Brain Injury Advisory Council (TBIAC) in 2003. In 2015, the 84th Texas Legislature removed most Health and Human Services advisory councils from statute and authorized the Health and Human Services Commission (HHSC) to establish advisory councils by rule. The Texas Brain Injury Advisory Council was created in rule on July 1, 2016. The scope of the Council was expanded to include all acquired brain injuries. The TBIAC advises HHSC and state leaders on the prevention of brain injury and improving the quality of life of individuals who have survived brain injuries and their families and caregivers. The TBIAC:

- Informs state leadership (the Governor and Legislature) of the needs of people with brain injuries and their families.
- Recommends policies and practices to meet those needs.
- Encourages research into the causes, prevention, and treatment of brain injuries.
- Provides long-term services and supports for people with brain injuries.
- Promotes brain injury prevention and awareness throughout the state.
- Facilitates the development and implementation of sustainable supports and services to meet the complex needs of persons who have survived a brain injury.

What has the TBIAC accomplished?

The TBIAC is the only State of Texas entity exclusively dedicated to serving Texans with acquired brain injuries, their families, service providers, and state agencies. Through its 19 years of service to Texas, the TBIAC helps the State improve and expand services to Texans with brain injuries and their caregivers. Among these are:

- Improve and expand the Comprehensive Rehabilitation Service program.
- Develop an insurance mandate that requires health insurers to meet the needs of individuals with brain injury.

- Contributed to the recommendation of cognitive rehabilitation therapy being added to the Medicaid Waiver Programs.
- Assist the Texas Education Agency to help Texas schools better serve students with brain injuries.
- Help the Texas Juvenile Justice System better identify and serve young offenders with brain injuries.
- Help establish laws that protect Texas drivers diagnosed with autism, deaf, and hard of hearing.
- Improve de-escalation training for officers by providing brain injury training for first responders.
- Promote prevention and minimize severity of brain injuries through use of helmets and use of concussion protocols in school athletics.
- Help the Department of State Health Services maintain and improve a brain injury registry with data to inform policy makers about the needs of Texans with brain injuries and their families.
- Supported and educated for continued full funding for the Office of Acquired Brain Injury.
- Provided subject matter expertise and referrals to the Office of Acquired Brain Injury and other Health and Human Services Commission offices.
- Continue to work with the Department of State Health Services Office of Injury Prevention accurate data collection and data expansion in order to accurately represent the number of brain injuries in the state of Texas.
- Continued collaboration efforts with non-profit organizations who also support brain injury survivors.
- Successfully requested a proclamation from Governor Greg Abbott declaring March as Brain Injury Awareness Month.
- Collaborate with the OABI to develop English and Spanish Information Fact Sheet regarding Acquired Brain Injury Myths and Facts and Fall Prevention Tips.
- The Family Navigator Program (FNP) was transferred to Hope After Brain Injury to work collaboratively with OABI to connect the families of a Texan with an acquired brain injury with a trained volunteer, who is either an experienced caregiver or survivor of a brain-injury. As much as possible, the FNP will be present to listen and help families gain access to needed services and resources, from the onset of the diagnosis throughout the recovery process and the return of functional living. Likely, a successful FNP will create a lasting dependable relationship with the survivor and family.
- The council placed a position statement that the state of Texas should adopt a universal helmet law for all motorcyclists.

- HHSC TBIAC rule (§351.825) amended July 1, 2020, 45 TexReg 3617 and in effect extended the abolition date through July 1, 2024.

What is the TBIAC working on?

The TBIAC Continues to:

1. Work with the Texas Legislature to:
    a. Add Cognitive Rehabilitation Therapy to the State Medicaid Plan.
    b. The council will work with Texas Workforce Commission, in collaboration with the Office of Acquired Brain Injury and the Texas Brain Injury Advisory Council, to enhance a comprehensive Vocational Rehabilitation plan for individuals with ABI across all levels of functioning.
    c. Submit the legislative report to the legislature by December 1, 2022 in accordance with 1TAC Part 15, §351.825(d)(2).
    d. Connect with the Department of Public Safety to discuss brain injury and other illnesses.
    e. Add non-traumatic brain injuries to the EMS and Trauma Registries maintained by the Department of State Health Services.
    f. Evaluate other states' brain injury programs for best practices, including public education for individuals with ABI.
    g. Adequately fund CRS and OABI.

2. Develop legislative briefs and other educational fact sheets as required.

3. Partner with EMS and Trauma Registries and CON-TEX Registry to receive database reports and obtain accurate data to identify occurrence of brain injury in Texas.

4. Build and extend partnerships with state brain injury groups, agencies, departments, and providers.

5. Work with HHSC to:
    a. Continue valuable collaboration between the TBIAC, OABI,

and HHSC staff. Suggestions for collaboration on current and future projects, brain injury fact sheets, brain injury conferences, promoting Brain Injury Awareness Month, and brain injury training for first responders and law enforcement personnel.

b. Involve the Council in TBIAC recruitment and development of council members by the Executive Commissioner, including transparency by OABI and HHSC in the member selection.
c. Develop a plan to address the long-term needs of Texans with brain injury.
d. The Database Review Committee will utilize updated data collection methods regarding the identification of Texans with ABI to obtain more current statistics.

6. Recommend that Comprehensive Rehabilitation Services (CRS) Program service coverage includes not only Traumatic Brain Injury, but also Non-Traumatic Brain Injury, which is often referred to as an Acquired Brain Injury. An Acquired Brain Injury may be either traumatic or non-traumatic. The Centers for Disease Control and Prevention defines a Traumatic Brain Injury as "a disruption in the normal function of the brain that can be caused by a bump, blow or jolt to the head or a penetrating injury." A Non-Traumatic Brain Injury, also known as Acquired Brain Injury, may include a brain tumor, ischemic and hemorrhagic stroke, brain infection, or anoxic brain injury. Eligibility for CRS is defined by Texas Administrative Code Title 26 Part 1 Chapter §352.7.

7. Develop an insurance mandate that requires health insurers to meet the acute and long-term healthcare needs of individuals with brain injury.

8. Develop an outreach model for case managers, social workers, and other healthcare professionals, serving rural areas and underserved communities of the Rio Grande Valley, South Texas community, East and West Texas regions, as well as the Panhandle, to include educational materials, online resources,

and accessibility of these resources that enable positive coping strategies and facilitate healthy, independent living on a long-term basis.

9. Explore more opportunities to limit morbidity and mortality through preventative measures. The council is currently exploring opportunities for fall prevention which is the leading cause of TBI in those ages 65 and older.

10. Work with HHSC to research options for building a network of brain injury focused social media sites that are user-friendly and easily accessible to the general public, along with brain injury resources and contacts to promote education and prevention through the OABI website.

Brain Injury Facts

What is an acquired brain injury?

An acquired brain injury may be either traumatic or non-traumatic. The Centers for Disease Control and Prevention (CDC) defines a traumatic brain injury (TBI) as "a disruption in the normal function of the brain that can be caused by a bump, blow or jolt to the head or a penetrating injury" (13). A TBI suggests injury either via direct forces (ex. blow to head from object), or injury via indirect forces (ex. blast injury or high-speed acceleration/deceleration forces). A non-traumatic cause of acquired brain injury may include tumors, strokes, brain infections, or anoxic brain injury (i.e., oxygen deprivation to brain tissue).

How does an acquired brain injury impact an individual?

Just as no two individuals are alike, no two brains are alike. The brain injury may cause the person to have impaired functional abilities in some or all areas listed below. Not all symptoms are likely to be present at once and the degree of impairment may range from minimal to severe. Impairments may be short lived or may last a lifetime. Examples of impairments are listed below:

Physical impairments may include problems walking, motor weakness or paralysis, loss of coordination, tremors, poor balance, chronic pain, headaches, dizziness, mental or physical fatigue, loss of sensation, difficulty swallowing, unclear speech and inability to pronounce words.

Cognitive/Communication impairments may include disoriented to time, place or situation, difficulty processing information, shortened attention span, impaired decision making and problem-solving abilities, difficulty understanding abstract concepts or following directions with multiple steps, memory loss, understanding others, difficulty or inability to express thoughts.

Perceptual impairments may include a change in ability to interpret and understand sensory experiences, namely in vision, taste, and smell, difficulty in observing and understanding people, circumstances, numbers, words, concepts, commonly used slang and idioms, or images.

Behavioral/Emotional impairments may include irritability, impatience, lack of initiative, impulsivity, denial of impairments, reduced tolerance for stress, inflexibility, flattened or heightened emotional response and reactions, passivity, aggressiveness, loss of impulse control that may result in physical or verbal aggression, or inappropriate sexual behavior.

Brain injury is not a single event; it is the initiation of a chronic condition where an individual is at risk of developing other conditions either directly or indirectly from the injury. Depending on severity of injury, it could be a lifelong condition, that evolves as the individual ages.

How many people does it effect?

Stroke

The American Stroke Association reported in 2020 that stroke is the fifth leading cause of death (more than 142,000) and about 795,000 Americans will have a new or recurrent stroke per year of which 87% are caused when a clot cuts off blood flow to a part of the brain (4). Stroke is a leading cause of disability and the leading preventable cause of disability. Data in 2020 stated more than 5.3 million Americans live with brain injury-related disabilities at a cost exceeding $82 billion annually (7).

The following data provided by the Texas EMS/TR were generated by hospital patient records submitted as of September 22, 2018.

- Stroke is a leading cause of disability and the leading preventable cause of disability due to many modifiable risk factors including high blood pressure, diabetes, smoking and diet. The annual direct and indirect costs was $45 billion in the United States (3).
- In Texas, 42% of stroke victims had moderate disabilities at discharge in 2016-2017 as determined by the modified Rankin scale. Note: Only 30.8% had a modified Rankin scale at discharge and a potential focus for hospital documentation (1).
- Data from the 2020 Texas Stroke System of Care Report , there were 800,000 strokes with 71,000 hospitalizations with total charges of nearly $6 Billion (1).
- Stroke is the tenth leading cause of death in children (14).

- It is estimated that the incidence of strokes in children ranges anywhere from 2.5-13 per 100,000 per year (12).

Traumatic Brain Injury

Traumatic brain injury (TBI) is caused by bump, blow, or jolt to the head or a penetrating head injury that results in the disruption of normal brain function. TBI is a preventable injury, yet it results in death and disability for thousands of people each year and remains a serious public health concern. There were approximately 223,135 TBI-related hospitalizations in 2019 and 64,362 TBI-related deaths in 2020 within the United States. This represents more than 611 TBI-related hospitalizations and 176 TBI-related deaths *per day.* These estimates do not include the many TBIs that are only treated in the emergency department, primary care, urgent care, or those that go untreated.

It is worth noting that age-adjusted rates of TBI-related deaths per 100,000 population were highest among persons residing in the southern states that include Texas (6). Per the Texas division of the Brain Injury Association of America, currently, approximately 381,000 Texans live with a TBI-related disability while 144,000 Texans sustain a TBI each year thereby making Texas the state with the second highest number of TBIs in the nation (5). Residents in rural areas experience higher TBI incidence and might encounter barriers to accessing life-saving emergency medical care and specialized TBI care. The age-adjusted rate of TBI-related deaths in males was more than *three times* the rate in females (6).

The CDC reports falls are the leading cause of non-fatal injuries for adults aged 65 and older. Rates of TBI-related deaths per 100,000 population were highest among adults aged ≥75 years, those aged 65-74 years, and individuals aged 55-64 years. As far as fatal injuries go, intentional self-harm and suicide are the most common cause of TBIs (35.5%%) (9) followed by unintentional falls(30% of TBI related deaths) and motor vehicle accidents (17%).

- In July 2015, the Texas Legislature's Sunset Advisory Commission adopted a management action (non-statutory) directing collaboration between the University Interscholastic League (UIL) and the University of Texas Southwestern forming the Concussion Texas (ConTex) Project. UIL and the University of Texas Southwestern athletic concussion data collection in 2017 to June 2018 showed 3,058 concussions reported to the registry, but only 27.4% of UIL districts were enrolled.
  - The first aim is to establish a dataset relating to concussion.

    - The second aim is to create a centralized database to upload concussion events
    - The third aim is to analyze report data results.
- All 6A UIL schools are required to report concussions in all sports starting in the 2019-2020 school year (2). Although COVID-19 prevented data collection for spring sports, 87% of division 6A schools reported to ConTex with a total of 3,032 concussion incidents with 2,966 from 6A schools. Concussed athletes were evaluated within 24 hours in 50% of the cases (2).

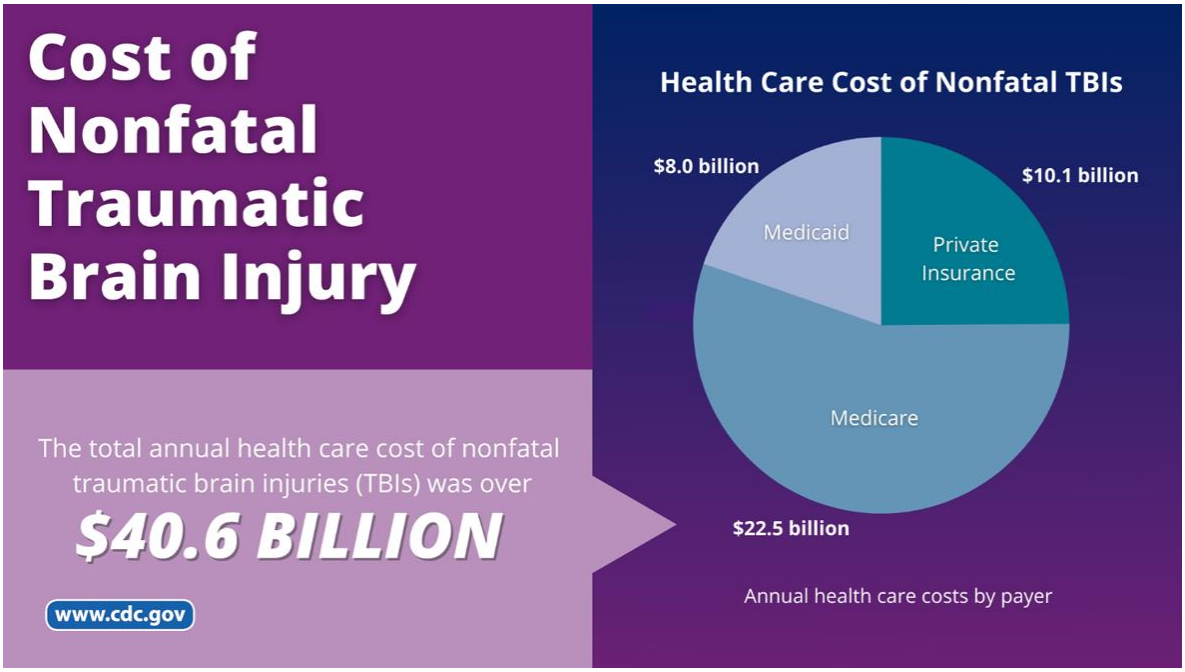
How much does it cost?

Texas Insurance Code title 8 subtitle E chapter 1352-Brain Injury requires commercial insurance companies to provide coverage for the spectrum of rehabilitation services needed after a brain injury, including cognitive rehabilitation and post-acute brain injury rehabilitation. Because of the acquired brain injury law, Texans have greater access to acute and post-acute rehabilitation.

Texans with ABI are fortunate to have access to a large number of acute and post-acute rehabilitation providers throughout the state that typically only accept private insurance. The state of Texas partially fills the funding gap through the services provided by the CRS program to individuals with TBI or traumatic spinal cord injury (SCI).

Texas does not currently offer programs and funding to help meet the long term needs of individuals living with brain injury. Other states have long term brain injury residential programs, structured brain injury day activity programs and more robust brain injury vocational rehabilitation programs. Access to all of these programs help individuals increase their ability to return to work and reduce disability and medical complications.

- Lifetime costs for one person surviving a severe TBI being up to $4 million.
- The average acute rehabilitation costs for survivors of a severe TBI is $55,000 (9).
- Falls in individuals over 65 years of age are the most common cause of TBIs.
- In 2015, the total medical costs for falls totaled more than $50 billion (8).
- Medicare and Medicaid shouldered 75% of these costs (8).
- The estimated national economic cost of nonfatal TBI in 2016, including direct and indirect medical costs, is estimated to be approximately $40.6 billion.



CDC 2016 DATA

Legislative Recommendations

Add cognitive rehabilitation therapy to the Texas Medicaid plan.

Recommendation addresses: access to care

It is common for individuals with brain injury to have cognitive deficits which impact their ability to make choices, understand, remember, and use information. Cognition includes attention, concentration, processing and understanding information, memory, communication, planning and organizing, reasoning, problem solving, decision making, judgment, and impulse control.

Currently the Texas Medicaid plan does not cover cognitive rehabilitation therapy. Cognitive rehabilitation has been proven to be an effective treatment to address cognitive deficits resulting from an ABI. The Cognitive Rehabilitation Task Force of the American Congress of Rehabilitation Medicine reviewed 370 studies (8). They concluded that there is sufficient evidence to support that cognitive rehabilitation clinical protocols are effective in treating cognitive deficits as a result of an ABI. Early intervention after a brain injury yields improved vocational/productivity outcomes, social integration, and independence.

Legislative History:

Texas added cognitive rehabilitation therapy to the STAR+PLUS Home and Community Based Services and the Community Living Assistance and Support Services (CLASS) Medicaid waiver programs in 2014 through Rider 66. This is an improvement for waiver participants with brain injuries; however, a significant number of individuals with acquired brain injuries do not have timely access to these waivers. Additionally, many individuals with an ABI cannot access services because they do not meet the disability-onset age requirements or medical condition requirements. For example, currently, only the STAR+PLUS HCBS program allows individuals aged 21 and up to be eligible for services; all other waivers require the individual to be under the age of 21 at onset of disability.

Texas passed legislation requiring insurance companies to cover cognitive rehabilitation under Texas Insurance Code Chapter 1352 which was established in

2001 when the 77th Legislature passed House Bill (HB) 1676, effective September 1, 2002. Rules to implement the statute were adopted August 26, 2002 (28 Texas Administrative Code §§ 21.3101-21.3107).

Recommend expanding the Comprehensive Rehabilitation Services program eligibility criteria to include services for individuals who have suffered a non-traumatic brain injury.

Recommendation addresses: access to care

Many individuals with non-traumatic brain injury exist in the state. Their overall rehabilitation potential and potential for gainful employment and re-integration back to community settings exist but there are limited resources to aide them in getting access to services for rehabilitation across the spectrum of recovery given they do not meet age-based criteria for waivers like the CLASS program. The CRS program in its current state has a broader reach and accessibility to services needed to supplement the STAR+PLUS Pilot Program. The STAR+PLUS Pilot Program is scheduled to start implementing services February 1, 2024 (15). The availability of such services could increase the quality of life of people with disabilities and decrease utilization of state-based resources over the individual's lifespan. Eligibility for CRS is defined by Texas Administrative Code Title 26 Part 1 Chapter §352.7.

Provide permanent and sufficient funding for the Comprehensive Rehabilitation Services program.

Recommendation addresses: support for services

The CRS program provides services needed to help Texans with a traumatic brain injury and/or traumatic spinal cord injury live independently in their home and community. The program focuses on three primary areas that affect both function and quality of life: mobility, self-care, and communication skills. Services are

provided in the person's home, a hospital, a residential facility, or an outpatient clinic or in a combination of settings to encourage the maximum flexibility in service and gain toward independence.

CRS services include inpatient comprehensive medical rehabilitation services, post-acute brain injury rehabilitation services, and outpatient therapies. The services are time-limited and designed to assist the consumer with daily living skills and to prevent secondary medical conditions, thereby increasing the consumer's ability to function independently and reduce the need for ongoing state services (HHSC LAR 3.A. Page 229 of 491).

The CRS program was first funded in 1991 with the establishment of dedicated funding to aid the recovery process of Texans who have experienced TBIs and/or traumatic SCIs. Part of the funding for the CRS program came from surcharges on convictions of felonies and misdemeanors. Other money has come from General Revenue Funds appropriated by the Texas Legislature.

Recommend that Texas adopt a universal motorcyclist helmet law.

Recommendation addresses: long-term healthcare costs

Enacting a universal helmet law would save lives, decrease severity of injuries, and to reduce the overall costs associated with care of individuals who suffer brain injuries without the use of a helmet. Helmet laws have been enacted and subsequently revised throughout the last 40 years in the state of Texas. Currently in the United States, 18 states have universal motorcycle helmet laws, 3 have no helmet laws, and 29 states including Texas, have partial helmet laws. It has been demonstrated in studies that severity of brain injury in motorcycle accidents is higher for those individuals not wearing helmets. Therefore, the associated cost of healthcare to the state, loss of employability at an individual level, and caregiver burden at the community level has increased in this population. Enacting a universal helmet law would potentially lessen the concerns identified.

Evaluate other states' brain injury programs for best practices, including public education for Texans with Acquired Brain Injury.

Recommendation addresses: improving partnerships

Texas must evaluate and review other state's brain injury programs, taking into consideration the programs and best practices for Texas. Additionally, concussion treatment, especially within the public education system, needs to be evaluated for consistency and efficacy. Knowledge of existing infrastructure in other states can help Texas replicate similar models to enhance public education and services for Texans with ABI.

Recommend Health and Human Services evaluate and develop a system to ensure ABI data is collected and reported if ABI is not listed as a primary diagnosis that measures long-term outcomes based on certain parameters such as age, county of residence, racial/ethnic identity, and access to care.

Recommendation addresses: data collection

Currently data is collected solely on the primary diagnosis. Brain injury survivors have many diagnoses such as heart attack, collapsed lung, seizures, cerebral palsy, and mental disorders. Therefore, the Acquired Brain Injury diagnosis may not be noted during data collection. Health and Human Services must create a system to collect all diagnoses.

Recommend non-traumatic brain injury registries be maintained by the Department of State Health Services.

Recommendation addresses: data collection

The Department of State Health Services has maintained a traumatic brain injury registry since 1998. Texas needs a comprehensive registry of all acquired brain injuries to better serve Texans and inform policy making. The current silos in communication prevent continuity of care, and collaboration between agencies to better inform patient care.

Non-Legislative Recommendations

Research and develop a Peer to Peer Brain Injury Support Program that serves and meets the needs of survivors, and possibly even care-partners, in each various communities or areas.

The Office of Acquired Brain Injury has collaborated with other state programs and national organization in the effort to research best practices for peer to peer support programs. The Office of Acquired Brain Injury will continue to research peer to peer support systems and peer mentoring program to provide a recommendation on appropriate process for establishment of a program to support Texans. A model of peer mentors has been found valuable in brain injury clubhouses to help facilitation community reintegration and social interactions. There are also independent and private providers in the community that have initiated peer to peer services that could benefit from support from state-based entities.

Collaborate with the Office of Acquired Brain Injury on current and future projects.

The TBIAC will collaborate with OABI in their work to include developing fact sheets, brain injury conferences, promoting Brain Injury Awareness Month, and brain injury training for first responders and law enforcement personnel to better treat and recognize the brain injury population. Committee members will participate in the preparation for the Texas Brain Injury Awareness Month Celebration (March) and review the biannual update to the "Texas Brain Injury Resource Guide" to help individuals with brain injuries and families.

Provide support for strengthening of partnerships and communication with state agencies as well as other state and national brain injury organizations.

We hold to this bottom-line truth: We can help each other. Now, it is time to start building relationships with other agencies within the State of Texas and the hundreds of non-profit organizations whose aim is to assist the brain injury community. Strengthening our service to other Texans who experience life after brain injury is one of our fundamental goals.

One of the potential benefits of building these relationships is to increase access to care of individuals with brain injury living in underserved rural and urban populations in Texas.

References

1. 2020 Texas Stroke System of Care Report, Department of State Health Services, https://www.dshs.texas.gov/heart/pdf/2020_Stroke_Report-(FINAL).pdf.

2. 6A concussion injury reporting instructions – all sports, https://www.uiltexas.org/health/info/6a-injury-reporting-instructions-all-sports.

3. A contemporary and comprehensive analysis of the costs of stroke in the United States. Girotra et al. Journal of Neurological Sciences Volume 410, 15 March 2020.

4. Acute ischemic stroke infographic. Accessed September 5, 2020, https://www.stroke.org/en/about-stroke/treatment/acute-ischemic-stroke-patient-resource-page/ais-infographic.

5. Brain Injury Association of America - Texas Division, https://www.biausa.org/find-bia/texas

6. Centers for Disease Control and Prevention (2022). Surveillance Report of Traumatic Brain Injury-related Deaths by Age Group, Sex, and Mechanism of Injury—United States, 2018 and 2019. Centers for Disease Control and Prevention, U.S. Department of Health and Human Services, https://www.cdc.gov/traumaticbraininjury/pdf/TBI-surveillance-report-2018-2019-508.pdf

7. Centers for Disease Control and Prevention. (2018). Report to Congress: The Management of Traumatic Brain Injury in Children. Accessed September 5, 2020, https://www.cdc.gov/traumaticbraininjury/pdf/reportstocongress/managementoftbiinchildren/TBI-ReporttoCongress-508.pdf

8. Evidence-Based Cognitive Rehabilitation: Updated Review of the Literature From 2003 Through 2008 Keith D. Cicerone et al. Arch Phys Med Rehabil 2011;92:519-30.

9. Fall Costs. Accessed September 30, 2018. Falls and Fall Injuries among Adults Aged ≥65 Years — United States, 2014.

10. Florence CS, Bergen G, Atherly A, Burns ER, Stevens JA, Drake C. Medical Costs of Fatal and Nonfatal Falls in Older Adults. *Journal of the American Geriatrics Society,* 2018 March.

11. Interactive atlas of heart disease and stroke. Accessed July 6, 2020. https://nccd.cdc.gov/DHDSPAtlas/Reports.aspx.

12. Kupferman JC, Zafeiriou DI, Lande MB, Kirkham FJ, Pavlakis SG (2017). Stroke and Hypertension in Children and Adolescents. *J Child Neurol*, 32:408-417.

13. Marr A, Coronado V. Central Nervous System Injury Surveillance Data Submission Standards-2002. Atlanta,GA: Centers for Disease Control and Prevention; 2004.

14. Mortality after pediatric ischemic arterial stroke Beslow et al. *Pediatrics* (2018) 141 (5): e20174146.

15. STAR+PLUS Pilot Program (SP3), Health and Human Services Commission, https://www.hhs.texas.gov/services/health/medicaid-chip/medicaid-chip-members/starplus-pilot-program-sp3.

Acronyms

Acronym	Full Name
ABI	Acquired Brain Injury
BIAA	Brain Injury Association of America
CLASS	Community Living Assistance and Support Services
CO	Carbon Monoxide
ConTex	Concussion Texas Project
CRS	Comprehensive Rehabilitation Services
DSHS	Department of State Health Services
EMS/TR	Emergency Medical Services and Trauma Registry
HBOT	Hyperbaric Oxygen Treatment
HHSC	Health and Human Services Commission
LPA	Licensed Psychological Associates
mTBI	Mild Traumatic Brain Injury
OABI	Office of Acquired Brain Injury
SCI	Spinal Cord Injury

Acronym	Full Name
TBI	Traumatic Brain Injury
TBIAC	Texas Brain Injury Advisory Council
UIL	University Interscholastic League