



Indiana State  
Department of Health  
Trauma and Injury Prevention

**Indiana Traumatic Brain  
Injury State Plan**

**2019 – 2024 Strategic Plan**

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## Introduction

### Mission Statement

To develop, implement, and provide oversight for a statewide coordinated care structure for traumatic brain injuries (TBIs) aiming to:

- Reduce the number of injuries
- Improve the care and outcomes of TBI patients
- Increase the access to resources and rehabilitation for TBI patients
- Provide evidence-based education to patients and families of those with TBIs

### Vision

Prevent brain injuries and improve long-term outcomes of TBI patients in Indiana.

### Core Values

- Health promotion and prevention
- Data collection, analysis, and information dissemination
- Evidence-based best practices for public health promotion, training, and health care quality.

### Strategic Priorities

The Division of Trauma and Injury Prevention considers the following Indiana State Department of Health (ISDH) priorities will have the most impact on the way the division operates and on its ability to deliver on its Mission and Vision:

1. Conduct a comprehensive TBI Needs Assessment to: 1) identify the incidence of TBIs, stratified by severity, across Indiana that are seen at emergency departments (EDs) and to which services and resources they are directed; 2) identify at which types of facilities people with TBI are being seen and the percentage of their overall caseload, including a sample of mental health/substance abuse and vocational and employment services; and 3) identify gaps in services. This assessment will include the full range of TBI severity, from concussion/mild TBI to severe.

2. As moderate to severe TBI is a risk factor for chronic disability, we will work to develop statewide systems and supports to proactively manage chronic TBI to prevent co-occurrence and co-morbidity, to minimize the disability associated with TBI, and to maximize health-related quality of life and independence in the community.
3. Determine goals and strategies for the assessment of concussion (mTBI) diagnostic and treatment services throughout the state and promote awareness and utilization of evidence-based concussion management guidelines.
4. Compliance to the recommended priority actions outlined by the Centers for Disease Control and Prevention (CDC) regarding TBI. The priority recommendations include: 1) identify the prevalence of disabilities due to TBI among their residents; 2) screen for TBI history among persons who receive state-funded health and social services; 3) train health and social service professionals to recognize and minimize the effects of TBI on behavior; and 4) make home and community services more accessible to people with TBI.
5. Better use information and data from electronic sources to: 1) develop statewide reports; 2) connect those with TBI to supports and services; and 3) sponsor outcomes-driven programs.

# Traumatic Brain Injury in Indiana

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 mechanical, penetrating, or concussive force. [1] It is important to note that this definition excludes additional modes of injury such as acquired brain injury. The severity of a TBI has a broad spectrum that may range from mild (a brief change in mental status or consciousness) to severe (an extended period of unconsciousness or memory loss after injury). TBI may be either unintentional or intentional (violence-related, including assault, homicide, and suicide) and can lead to death, disability, and lifelong health consequences. Unintentional injury accounts for the vast majority of TBI-related deaths and can be defined as involving injury or poisoning by unpremeditated measures. Unintentional injury is also the leading cause of years of potential life lost in Indiana, which is a measure of premature mortality and early death. Regardless of intention, TBI has emerged as a public health issue leading to significant morbidity and mortality.

The injury pyramid provides a visualization of the injury spectrum, illustrating the reality that injury-related deaths represent a small percentage of overall injury-related outcomes. While fatalities are the most devastating outcome related to TBI, the analysis of hospitalization and emergency department (ED) visits related to injury provides additional useful information. Although injury deaths are significant, nonfatal TBI occurs more frequently. More than 36,000 Hoosiers are hospitalized and more than 620,000 visit EDs for injuries each year.



Adapted from Safe States Alliance (formerly State and Territorial Injury Prevention Directors Association): *Safe States*, 2003 Edition

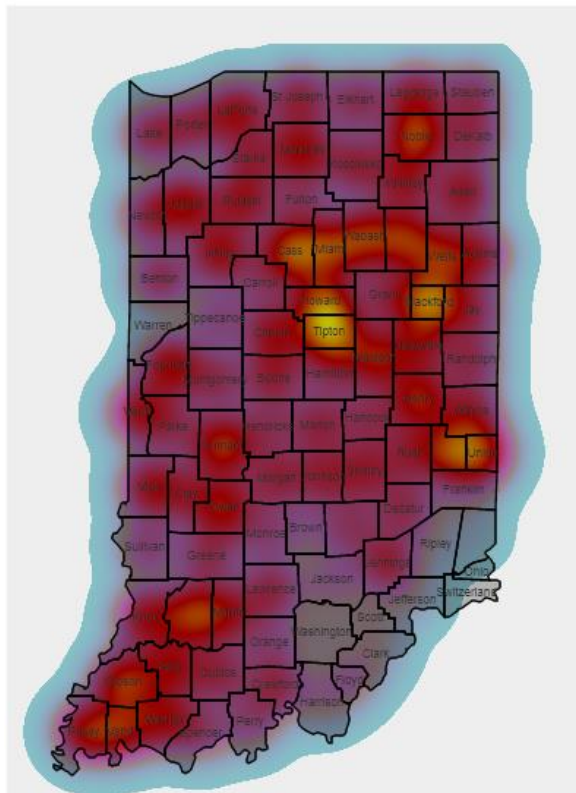
## TBI Mortality Trends in Indiana

Injury is the leading cause of death for Indiana residents ages 1 through 44 years [2] and the fifth-leading cause of death overall. Nationally, TBI contributes to about 30% of all injury-related fatalities. Additionally, the CDC estimates that TBI contributes to around 50,000 deaths annually across the United States. In 2016, TBI was listed as the primary cause of death or in combination with other injuries and conditions in 1,239 Hoosier deaths (18.6 per 100,000 Indiana residents). Of the TBI-related deaths in Indiana, 58% were caused by unintentional injury (25% unintentional falls, 23% motor vehicle collisions, 9% other, 1% struck by/against). The highest number of TBI-related deaths were among Hoosiers older than 65. In 2016, men were disproportionately burdened by TBI-related deaths, accounting for 76% (28.8 per 100,000 Indiana residents) of TBI deaths.

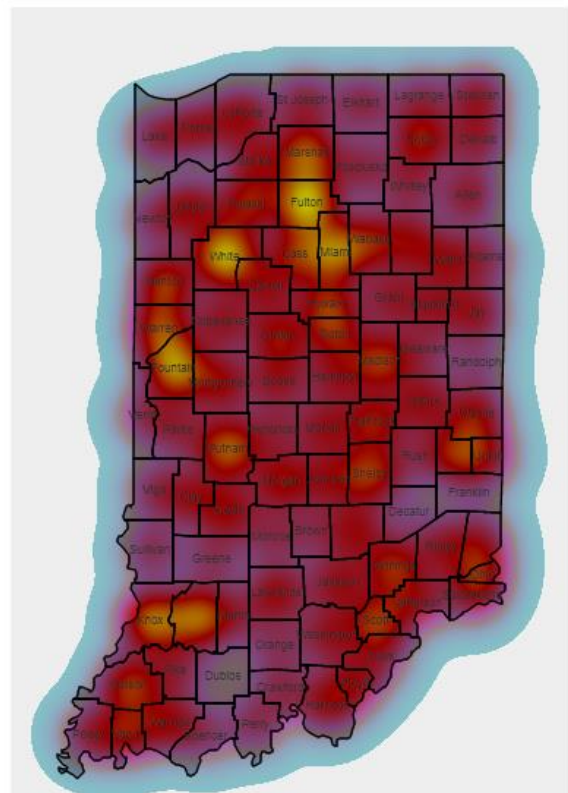
### TBI Hospitalization Trends in Indiana

In 2016, TBI was diagnosed in more than 282,000 hospitalizations across the United States. [1] Within the same year, Hoosiers experienced 6,726 TBI-related hospitalizations (101.4 per 100,000 Indiana residents). The most common diagnoses within this population were Traumatic Subarachnoid Hemorrhage (approximately 36% of TBI-related hospitalizations) and Traumatic Subdural Hemorrhage (approximately 23% of TBI-related hospitalizations). Hoosiers older than 65 accounted for about 48% of TBI-related hospitalizations in 2016. Additionally, Hoosier men experience TBI hospitalizations at a higher rate (124.7 per 100,000 Indiana residents) than their female counterparts. In 2016, the leading causes of TBI hospitalization were due to an unintentional fall (46% of TBI-related hospitalizations) and motor vehicle collision (14% of TBI-related hospitalizations).

#### All TBI - Inpatient



#### All TBI- ED Visit



Above displays a TBI incidence heat map of Indiana's TBI-related hospitalizations and ED visits in 2016. The areas accented in yellow indicate the highest rates of TBI hospitalizations and ED visits. Areas that lack color display areas with the lowest rates of TBI.

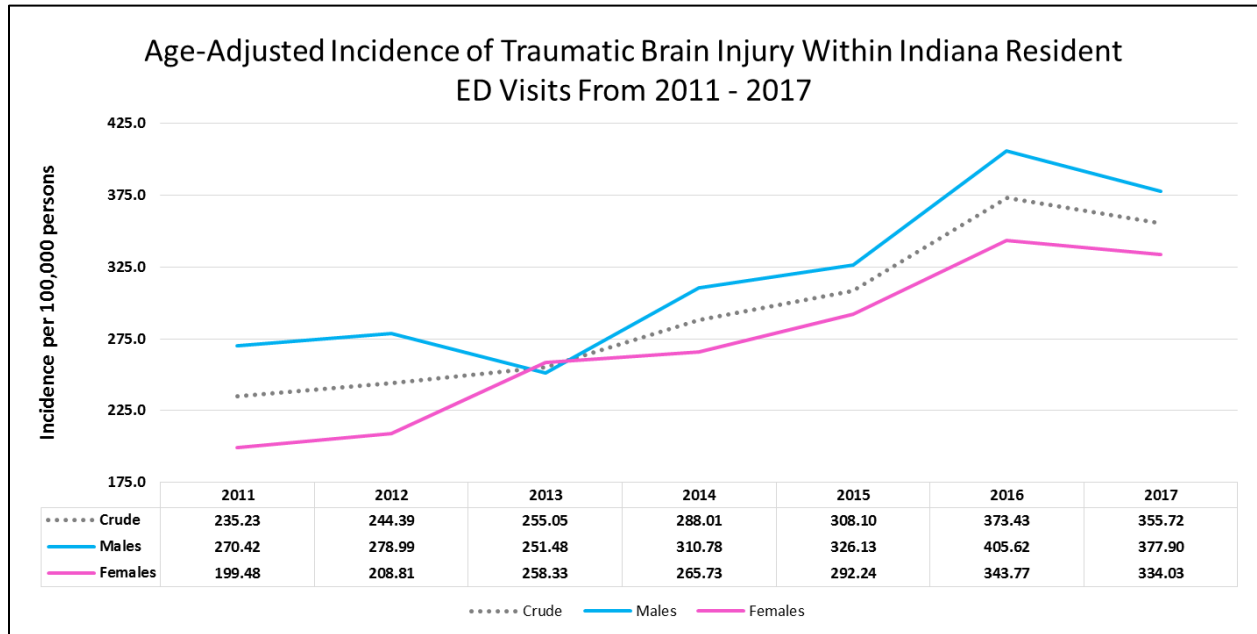
### TBI Emergency Department Visit Trends in Indiana

In the most recent TBI report, the CDC noted a 47% increase in national TBI-related ED visits over six years. [2] Additionally, the report estimates that annually there are about 2.5 million TBI-related ED visits within the United States. This dramatic increase in TBI-related ED visits can be seen within Indiana over the same time frame. Currently, TBI-related ED visits have an incidence rate of 355.7 per 100,000 Indiana residents. In 2016, Hoosiers living in rural counties were at 2.2 times the risk for a TBI-related ED visit



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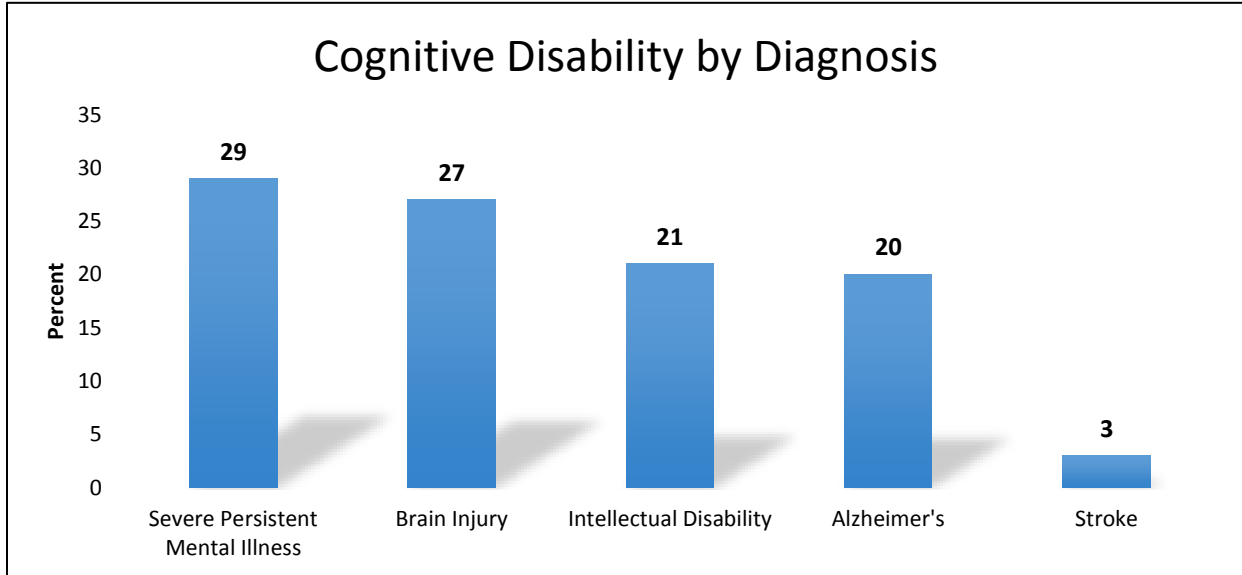
compared to their metropolitan counterparts. In total, roughly 68% of TBI-related ED visits occurred within rural counties (283.2 per 100,000 Indiana residents). Amongst TBI-related ED visits, concussions were the most frequent diagnosis, accounting for around 67% of cases. Furthermore, of those presenting at Indiana trauma centers, 47% reported an injury severity score (ISS) between 0 and 14. The highest risk for TBI ED visit was found in men (377.9 per 100,000 Indiana residents). The most frequently cited cause of injury was unintentional falls (approximately 45% of TBI-related ED visits) and motor vehicle collision (about 39% of TBI-related ED visits).



The CDC estimates that approximately 80,000 to 90,000 people in the United States each year will have a TBI that results in lifelong disability and that 5.3 million people are living with chronic impairment related to TBI. [1] These findings would suggest that Indiana has approximately 112,000 people with chronic disability associated with TBI and each year will have 1,785 citizens with new onset of chronic disability. Also, while not commonly recognized, it has been shown that brain injury is the second most common cause for cognitive disability relative to other diagnoses.

According to the CDC, TBI, especially moderate to severe injury or repetitive mild TBI, frequently results in chronic disability. [2] According to a study from the Traumatic Brain Injury Model Systems, the level of disability that follows from TBI is not static and change is more common than stability. While 30% of patients will have less disability from one follow-up epoch to another, 30% will become more disabled, and only about 40% will remain stable. [3] Further, people with TBI have significantly greater health risks, including higher rates of diabetes, pain, insomnia and fatigue, seizure disorders, hypertension, myocardial infarction, cerebrovascular disease, peripheral vascular disease, chronic pulmonary disease, and renal disease. [4] Substance abuse and psychiatric comorbidities exacerbate the level of disability following TBI. It is also a risk factor for dementia or premature cognitive decline. Finally, environmental variables such as lack of

access to rehabilitation and brain injury services and supports, lack of family support, and social isolation can result in worsening of disability. Therefore, it has been recommended by the CDC that TBI is proactively managed as a chronic condition. [5]



### TBI as a risk factor for Incarceration and Drug Abuse

Individuals with moderate to severe TBI or repetitive mild TBI are at greater risk developing psychiatric and substance abuse disorders. Therefore, these patients are at an increased risk to become engaged with the criminal justice system. The CDC has indicated that TBI in prisons is an unrecognized problem. [6] It has been found that 60% of the prison population has a lifetime history of TBI as compared to 8.5% of the general population. [7] TBI during childhood and adolescence increased the risk of concomitant criminality and conduct disorder 18.7 fold. [8] Further, 24% of subjects with TBI had committed crimes leading to arrests within two years post-injury and by five years after the head injury; 31% had legal involvement. It is noteworthy that in this study, 83% of respondents reported sustaining a TBI before their initial engagement with the criminal justice system.

Indiana TBI researchers have found that formerly incarcerated individuals with TBI are almost twice as likely (23.5%) to be re-incarcerated within a year post-release as compared to formerly incarcerated individuals without TBI (12.1%). [8] They also screened participants in the Marion County Problem Solving Courts and found that 59% of all participants screened positive for a lifetime history of TBI and that 7.5% tested positive for moderate to severe TBI. Veterans are unfortunately even more affected by TBI. In the Marion County Veterans Problem Solving Court, they found that 95% screened positive for mild to severe TBI, but they have also identified that 67% of veterans in a medium security prison in Indiana screened positive for moderate to severe TBI. Researchers suspect this is likely associated with chronic cognitive and behavioral disability. [9]



It also has been reported that between 70% and 80% of patients with TBI are discharged from acute in-patient rehabilitation on an opioid. [10] Based on analyses of 14,398 subjects in the TBI Model Systems database, individuals with TBI were found to be 11 times more likely to die of an overdose than the non-brain-injured population. [11] Possible reasons for this significant increase in risk associated with TBI might include a) a high rate of premorbid substance use among individuals who sustain TBI; b) higher opioid prescription rates due to TBI often resulting in a headache and because many people with TBI also have orthopedic injuries; c) the frequent impairment of cognitive functions such as memory, which may result in people with TBI forgetting that they have taken their medication and therefore take it again; d) the common impairment of judgment and impulsivity that comes with a TBI, which may lead to overuse of pain medication; and e) the development of mood disorders for which people with TBI may self-medicate with opioids. These relationships between TBI, opioid misuse, and incarceration are complex, but interrelated and represent significant health care and societal challenges.

### Financial Impact of TBI in Indiana

The economic consequences from TBI are often extensive. As TBI severity increases, so too do the short- and long-term medical costs for patients. The CDC estimates that the national direct and indirect economic cost of TBI was more than \$76.5 billion annually. [2] Furthermore, the average lifetime cost of a severe TBI is over \$3 million and over \$1 million for a moderate head injury. These estimates equate to roughly \$1,600 a day. Current recommendations suggest individuals receive 80 weeks of acute and post-acute rehabilitation.

As stated previously, the majority of the TBI burden rests in those older than 65 years old. This trend places a substantial burden on Medicaid funding. Currently, Medicaid does not fully fund post-acute rehabilitation for the recommended duration. However, Indiana provides a TBI Waiver, which aims to provide the auxiliary care and services to TBI patients. To date, Indiana provides 200 Hoosiers with TBI waivers. Currently, Indiana has a long list of TBI patients seeking this additional coverage, which is granted until the insured expires.

### TBI Surveillance and Data

Indiana has robust surveillance and data collection infrastructure focused on TBI. To date, the Indiana State Department of Health (ISDH) has been tasked as the primary governmental agency for collecting and analyzing TBI data for Hoosiers. The ISDH Division of Trauma and Injury Prevention (DTIP) houses a state-wide trauma registry that collects highly specific medical records data from all Indiana hospitals with EDs. Also, ISDH holds access to in-patient and outpatient databases provided by the Indiana Hospital Association (IHA). The information is provided annually and aggregates the general diagnostic information from individuals seen at more than 120 hospitals across Indiana. ISDH holds a license for ESSENCE, an HL7 syndromic surveillance tool that allows for real-time hospital admissions data. Currently, ISDH fails to use this tool for TBI identification. However, the agency seeks to explore uses for trend identification and the linking of patients to services. Finally, the Indiana Department of Homeland Security holds access to data specific to EMS runs conducted throughout the state.

Several non-government agencies collect and analyze TBIs within Indiana. The Eskenazi Health Brain Center and the Regenstrief Institute manage a longitudinal TBI database that monitors the short- and long-term health outcomes of more than 10,000 TBI patients. These systems have been widely used for publication of primary scientific literature. Also, the Brain Injury Association of Indiana holds an information and referral line that seeks to both connect patients to services and collect data.

## Acute and Post-Acute Care of TBI

### Indiana Trauma System and Acute Care

A trauma system is an organized approach to treating patients with acute injuries. We need to evaluate the entire trauma system to get a better understanding of the continuum of trauma patient care in Indiana. Indiana does not have an integrated statewide trauma system—we are one of only six states without one. Indiana has components of a system:

- Emergency medical services (EMS) providers
- Trauma centers
- Trauma registry
- Rehabilitation facilities

The first phase of Indiana's trauma system activates immediately following a TBI—a call is made to the 911 operator, the response is coordinated among various EMS providers, initial assessments and diagnoses of the patient are made, and the patient is stabilized and quickly but safely transported to a local hospital or trauma center. EMS providers are often the critical link between the injury-producing event and definitive care at a trauma center or local hospital.



The first-hour post-injury is known as “the Golden Hour,” when critical skilled care must be provided. The Indiana Department of Homeland Security (IDHS) is responsible for oversight of the EMS in Indiana.

Trauma centers are hospitals that have applied for and been granted verification as a trauma center by the American College of Surgeons (levels I, II, and III, with level I trauma centers providing the highest level of trauma care). Trauma centers are unique in their capabilities and are not the typical community hospital emergency department (ED). For all the trauma centers in Indiana, there are still not enough to adequately meet the needs

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of Hoosiers and visitors to the state who become injured. Hospital EDs are part of the statewide trauma system, as not all injured patients are taken to trauma centers; the vast majority of injured patients can be, and are, treated at local, non-trauma center hospitals. Non-trauma center hospitals

### Trauma Centers in Indiana

#### Level I

##### Indianapolis

Eskenazi Health  
IU Health Methodist Hospital  
Riley Hospital for Children at IU Health  
St. Vincent Hospital & Health Services

#### Level II

##### Evansville

Deaconess Hospital  
St. Vincent - Evansville

##### Ft. Wayne

Lutheran Hospital of Indiana  
Parkview Regional Medical Center

##### South Bend

Memorial Hospital of South Bend

##### Terre Haute

Terre Haute Regional

#### Level III

##### Anderson

St. Vincent Regional Hospital  
Community Hospital - Anderson

##### Bloomington

IU Health Bloomington

##### Crown Point

Franciscan Health - Crown Point

##### Gary

Methodist Hospitals - Northlake Campus

##### Jasper

Memorial Hospital and Health Care Center

##### Lafayette

Franciscan Health - Lafayette East  
IU Health - Arnett Hospital

##### Muncie

IU Health - Ball Memorial Hospital

##### Richmond

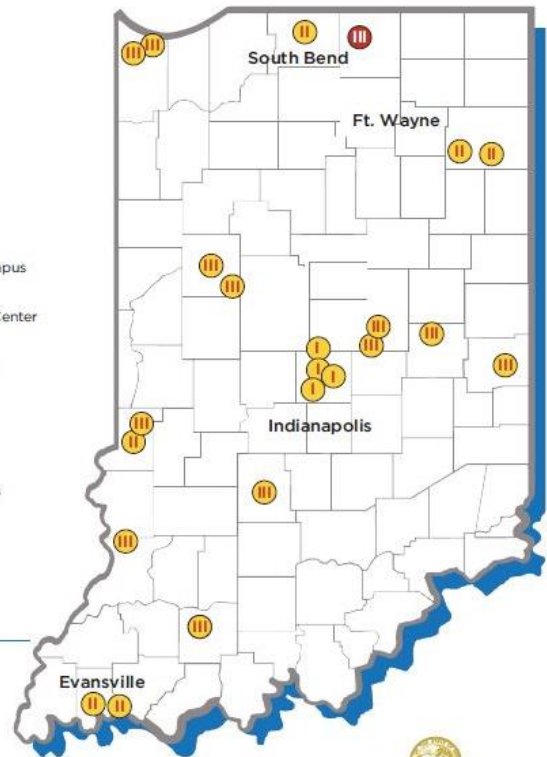
Reid Hospital & Health Care Services

##### Terre Haute

Union Hospital - Terre Haute

##### Vincennes

Good Samaritan Hospital



### In the process of ACS Verification

#### Level III

##### Elkhart

Elkhart General Hospital

### Total Trauma Centers in Indiana\*

- Level I = 4
- Level II = 6
- Level III = 13
- Total = 23**

\* Total includes current and In Process Trauma Centers

Updated: 7-10-2018

stabilize and provide definitive life-saving care for patients who don't require trauma center care. Many times, especially in rural areas where timely access to trauma centers is not possible, non-trauma center hospital EDs provide definitive care to trauma patients out of necessity.

The Rural Trauma Team Development Course (RTTDC) emphasizes the critical role of smaller, often rural, non-trauma hospitals in the overall state trauma system. The RTTDC program covers key concepts in the triage of trauma patients, including the decision of whether the hospital can meet the patient's needs or should transfer the patient to a trauma center. Understanding everyone's role in a statewide trauma system is crucial in providing proper care to trauma patients, especially in light of the fact that at least 60% of all trauma deaths occur in areas where only 25% of the population lives.

Acute medical care facilities are hospitals that provide care for short periods of time. TBI patients are admitted to an acute medical care facility to allow them to recover from their injuries as well as recover from procedures and surgeries utilized to fix their injuries. The

most serious TBIs will have the patient recovering in the intensive care unit, while less seriously injured patients may recover in a critical care unit, a step-down care unit, or a medical-surgical care unit. There are more than 120 hospitals in Indiana, all of which are regulated by ISDH.

### TBI Rehabilitation

Rehabilitation centers care for TBI patients' post-acute care and seek to enable these patients to realize their fullest post-injury potential. Often, these patients have sustained severe or catastrophic injuries in conjunction with their TBIs, resulting in long-standing or permanent impairments. Rehabilitative interventions strive to allow the patient to return to the highest level of function, reducing disability and avoiding whatever possible. When rehabilitation results in independent patient function, there is a 90% cost savings compared with costs for custodial care and repeated hospitalizations. Unfortunately, the rehabilitation phase of care often isn't sufficiently integrated into the trauma system, even in the most mature, well-developed statewide trauma systems.

In 2014, the Indiana General Assembly adopted a statute stating that, before Jan. 1, 2015, ISDH shall adopt rules that establish a license and provide regulations for a facility that provides specialized treatment and services for traumatic brain injuries.

### TBI and Resource Facilitation

Individuals with TBI present with significant differences in what they need, and those needs change over time. New conditions or co-morbidities emerge. Long-term health outcomes from TBI are compromised by the absence of a system that provides for ongoing surveillance and assessment of TBI needs or health status that would trigger both preventative services and supports or evidenced-based treatments for TBI-related conditions that affect the level of disability.

Because there are systemic gaps between the trauma center and acute care with community-based providers, the latter are often not aware that the person has a history of TBI, limiting the provider's capacity to accommodate the effects of the TBI and to alter or provide new treatment strategies. To provide the best care for people with TBI, there needs to be a system through which providers are aware of the history of TBI. A proactive and organized continuum of care for individuals with TBI should begin, not end, with the trauma center or acute hospital.

Unlike mental health, there is no state agency for brain injury, and people with brain injury are being unknowingly served in a variety of programs and facilities supported by different state agencies (e.g., employment services, mental health). There also is an absence of integration and coordination between community-based TBI providers that would allow for TBI-informed coordination of services among providers. Further, the health care system typically lacks awareness of community-based services and supports like mental health, addiction, employment, or waiver services. Last, there are significant limitations in the availability of TBI specialized health care professionals, such as physical medicine and rehabilitation (PMR) and rehabilitation-focused neuropsychology (NP). Many individuals with TBI do not even have a primary care physician (PCP).

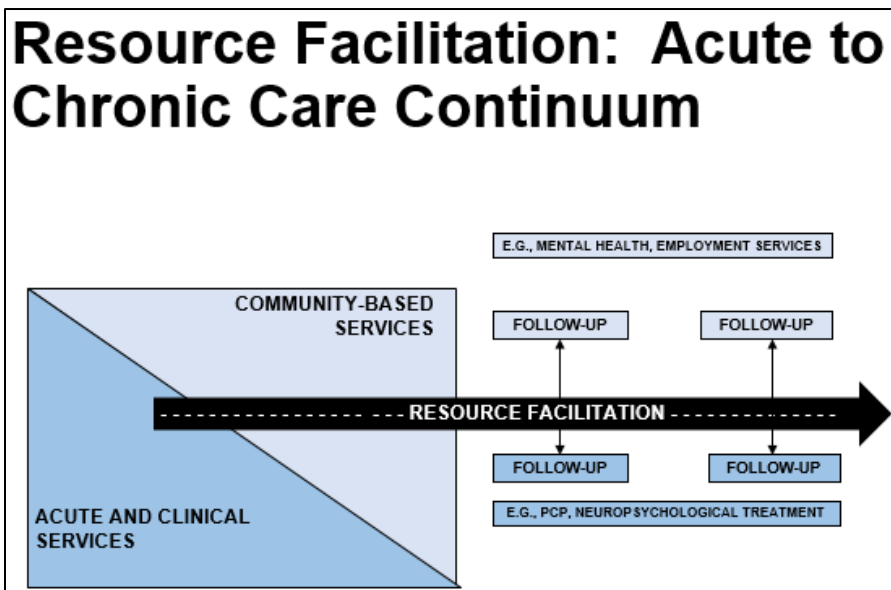


To address some of these barriers, the model of resource facilitation (RF) was developed in the 1980s and 1990s to establish systems of supports and services, as well as to promote access to them. Indiana began work in this area in 2008 and explicitly focused on vocational and return-to-school outcomes. Three published studies demonstrated that RF resulted in significantly better vocational outcomes, where subjects in the control groups returned to work at a rate from 36% to at best 50%, as compared to 64% to 70% of the RF groups who returned to work or school. Researchers at the Center for Business and Economic Research, Miller College of Business at Ball State University, recently completed an economic impact study of RF on Indiana. [12] They demonstrated that the annual aggregate lifetime savings generated as a result of RF for Indiana was \$249.1 million a year for wages and benefits, \$30.97 million a year for revenue from taxes, \$80.1 million a year for savings to SSDI/private disability, and \$6.6 million a year for Supplemental Nutrition Assistance Program (SNAP), resulting in a total of \$366.77 million in savings a year. [12]

RF is an evidence-based service that:

- Provides brain injury-specific education and promotes awareness of resources to individuals with brain injury, their families, other providers, and the community
- Proactively helps the individual identify, obtain, and navigate needed instrumental, brain injury-specific, community and vocational supports and services particular to the person's brain trauma and his specific goals
- Ensures collaboration, integration, and coordination between providers and community-based resources

Research in RF has also demonstrated that it results in a significant reduction in the level of disability associated with TBI, even for participants who were on average 10.1 years post-injury. [13] It was also found that the participants' service utilization and their perceived need for services at enrollment and discharge decreased significantly. [14] The



data would appear to suggest that the RF was successful in meeting the perceived needs of individuals with brain injury as well as significantly reducing their level of disability. Last, in recently completed research, these researchers found that RF reduced the risk of recidivism by 60%, even though people with TBI were found to be twice as likely to

recidivate. Based on these findings, in 2018, ISDH was awarded a federal grant for \$900,000 to develop the first-ever proactive TBI management system. This grant will be used to create a system of care that follows patients from the trauma center to a care team, which will assess needs and work with TBI-impacted individuals and their caregivers to develop a care plan. That plan will be supported through RF, which connects those with TBI to all the resources necessary for quality health care and home and community reentry, including assistance applying for health insurance, help in finding a primary care physician, and transportation to doctor's appointments.

To carry out this grant, ISDH has partnered with the Rehabilitation Hospital of Indiana (RHI). The RHI RF Department developed the evidence for the efficacy and effectiveness for improving vocational outcomes for individuals with brain injury before becoming a service provider for RF throughout Indiana, which has some of the highest vocational outcomes in the nation. It is worth noting that many of those successfully served by RHI had previously undiagnosed TBI. To achieve and sustain these outcomes, ISDH and the RHI RF Department strive to build the capacity of the professionals and community service providers who work with people with brain injury throughout the state.

## TBI Community Living Services

### Medicaid TBI Waiver

There is one home- and community-based program in Indiana explicitly designed for individuals with brain injury. Indiana Area Agencies on Aging serve people of any age with a disability. They provide information and referrals to local resources (financial assistance programs, transportation, utility assistance resources, etc.) as well as broker publically funded programs (CHOICE, Aged and Disabled Waiver, and TBI Waiver) to help people stay in their homes and avoid nursing facility placement. Currently, Indiana's TBI Waiver is a small specialty program designed to support 200 individuals with moderate to severe deficits whose resulting disabilities place them at risk of institutionalization.

### Behavioral Health Services

The cognitive, emotional, and behavioral symptoms that result from a brain injury can impact the effectiveness of traditional behavioral health services. Therefore, Indiana has adopted a Residential Brain Injury Care System that uses neurobehavioral programs to provide intense behavioral treatment to patients with severe behavioral disturbances caused by TBI. This system aims to give those with protracted impairment for individuals unable to reside within nursing homes.

### Incarceration Services

Indiana stands at the cutting edge of recidivism reduction and jail diversion based on the research that has already been done on resource facilitation (RF) and its impact on recidivism. A variety of initiatives are underway to sustain this work. Indiana has begun providing retrospective TBI screening and mental health services to offenders. Additionally, Indiana maintains strong interagency collaboration with Indiana problem-



solving courts to identify and screen those being incarcerated from TBI to provide treatment plans to avoid incarceration.

## **Traumatic Brain Injury Advisory Board**

### **Purpose**

The Indiana TBI Advisory Board is a multifaceted collection of about 30 health care providers, policymakers, and consumers. The intent of this group is to address the strategic planning and policy development and to guide services related to preventing TBI and improving health, disability, and health-related quality of life following TBI. This collection of subject matter experts, consumers, and caregivers of people with TBI was formed to create an Indiana TBI State Plan that implements and oversees strategies to achieve these goals.

### **Advisory Board Subcommittees and Task Forces**

TBI State Plan Committee – Craft a written format of the goals and objectives outlined by the TBI Advisory Board

TBI Consumer Task Force – An amalgamation of current and former TBI patients who seek to provide suggestions regarding the improvement of TBI care

Criminal Justice Task Force – Reform practices within the criminal justice system to treat TBI within incarcerated individuals

## Goals and Recommendations

### 1. Identify Strengths and Weakness of Indiana TBI Infrastructure

The largest priority for Indiana is to systematically identify the statewide needs. The most recent Indiana TBI needs assessment was conducted in 2004 and currently stands outdated. Therefore, Indiana will seek to identify these gaps in hopes to address the needs of Hoosiers with higher specificity.

Objective	Strategies
<b>a. Identify the current state of TBI care, prevention, and rehabilitation within Indiana.</b>	a.1 A third-party consulting company (Ghost Map Analytics) will conduct comprehensive needs and resources assessment of TBI care system.
	a.2 The TBI Advisory Board will identify the key agencies and organizations with active TBI grants and prevention interventions.
	a.3. ISDH will establish and publish literature outlining the prevalence, incidence, and supplemental information of TBI within Indiana residents.

### 2. Improve Access to Educational Resources and References for Medical Professionals, Patients, and Their Families

One of the primary complaints from TBI patients and their families involves the lack of general and in-depth materials available. Additionally, many medical professionals have requested recommendations regarding “best practices” and recommendations for proper TBI care. Currently, Indiana fails to provide stakeholders with TBI the necessary details about recovery from TBI. Therefore, it is imperative that Indiana seek to provide patients and caregivers up-to-date materials that will inform evidence-based policy and care for TBI recovery.

Objective	Strategies
<b>b. Improve access to educational resources and references for medical professionals, patients, and their families.</b>	b.1. ISDH will establish a centralized web portal for stakeholders to find current TBI data and educational resources.
	b.2. ISDH will collaborate with the Brain Injury Association of Indiana to provide an aggregate list of the recommended detailed services provided throughout the state.

	b.3. ISDH and the TBI Advisory Board will examine funding source challenges and opportunities for the development of statewide systems and support to proactively manage TBI as a chronic condition.
	b.4. ISDH, the Indiana State Trauma Care Committee, and the TBI Advisory Board will seek to establish and publish “Best Practice Guidelines” for the recommended acute care, post-acute rehabilitation, and surveillance of TBI patients.
	b.5. ISDH and the TBI Advisory Board will develop materials aimed at educating legislators on TBI.
	b.6. ISDH and the TBI Advisory Board will create a TBI symptoms checklist, which will include a listing of TBI resources, for the patient to advocate with his health care providers.

### 3. Increase the Access to Care for TBI Patients in Indiana

As noted, many people with TBI are not followed in a TBI-specific continuum of care, starting at the emergency department (ED) or trauma center. To promote access, Indiana must work to improve access to TBI rehabilitation and post-acute services. Based on several studies, RF has been found to dramatically enhance the probability for successful reintegration of TBI patients back into their daily lives. Additionally, RF has been found to drastically reduce the likelihood of an accidental drug poisoning, opioid addiction, and incarceration in those recovering from a TBI. Currently, Indiana holds the resources to enhance the reach of this enacted program. Not only will the expansion of RF provide preventative measures for reducing the risk of recidivism and opioid misuse, but it will also provide the optimum clinical and psychological care that is tailored to each patient.

Objective	Strategies
<b>c. Increase the access of care for TBI patients in Indiana.</b>	c.1. ISDH will explore funding opportunities to expand the use of the RF model by hospitals and rehabilitation centers.
	c.2. ISDH, the Family and Social Services Administration, and the TBI Advisory Board will cultivate a new TBI waiver alternative to the Medicaid TBI waiver.
	c.3. The TBI Advisory Board will establish an integrated care pathway to reduce early termination of services.

	c.4. ISDH will seek to Improve the collaboration and connectivity of the trauma centers with TBI services and supports, including relationships and partnerships with key stakeholders, coalitions, and networks throughout the state and nation.
	c.5. ISDH will provide evidence and data necessary to identify and improve TBI care for underserved communities.

**4. Improve the Surveillance and Prevention of Youth TBI**

According to the CDC, experiencing a TBI during adolescence dramatically impacts the individual’s long-term health in a negative manner. At this time, Indiana fails to provide any standardized efforts for returning a student to the classroom or extracurricular activities after a TBI. Further, Indiana is one of the few states that fails to have any involvement in the surveillance of sports-related TBI in youth. Due to the well-outlined, long-term negative impact of TBI, it is imperative that Indiana begins establishing procedures and resources to ensure the safety of Hoosier youth.

Objective	Strategies
<p><b>d. Improve the surveillance and prevention of adolescent TBI.</b></p>	<p>d.1. ISDH will seek to elicit support from the Indiana High School Athletic Association and Indiana Department of Education for establishing formal procedures for returning youth and adolescent TBI patients to class and sports.</p>
	<p>d.2. ISDH will seek to create a surveillance tool to monitor the TBI trends in youth and adolescent sports.</p>
	<p>d.3. The TBI Advisory Board, Brain Injury Association of Indiana, and ISDH will provide teachers, counselors, and school nurses educational resources about managing TBI patients in the classroom.</p>
	<p>d.4. ISDH will seek methods to improve the collection and accuracy of ICD-10 coding for sports-related TBI seen in EDs and urgent care clinics.</p>

**5. Diversion of TBI Patients Within the Justice System**

Much has been done in recent years to identify the link between TBI exposure and compulsive and criminal behavior. More specifically, a recent study identified that 80% of individuals in Indiana Problem Solving Court had a TBI within the last two years. In collaboration with TBI subject matter experts, the Marion County Problem Solving Court and jail system have worked to pilot an intervention that seeks to provide treatment and mental health services to those who have suffered a recent TBI. Backed by research, Indiana hopes to continue to navigate TBI patients away from the justice system.

Objective	Strategies
<p><b>e. Diversion of TBI patients within the justice system.</b></p>	<p>e.1. Indiana Problem Solving Court and Indiana Criminal Justice Institute (ICJI) will expand the screening of incarcerated individuals for TBI within the justice systems of additional counties.</p>
	<p>e.2. The TBI Advisory Board and Problem Solving Court will seek to establish recommendations for diversion of TBI patients within the justice system.</p>
	<p>e.3. The TBI Advisory Board will develop a diversion prediction model to identify high-risk TBI patients not yet incarcerated.</p>
	<p>e.4. ISDH and the TBI Advisory Board will seek to establish the prevalence of TBI within the Indiana Justice System and further outline the role TBI plays in criminality.</p>
	<p>e.5. The TBI Advisory Board will offer recommendations to expand the services offered to incarcerated individuals recovering from a TBI.</p>

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