

2014


Working with Traumatic Brain Injury in Schools: Transition, Assessment, and Intervention

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Jantz, Paul B.; Davies, Susan C.; and Bigler, Erin D., "Working with Traumatic Brain Injury in Schools: Transition, Assessment, and Intervention" (2014). *Counselor Education and Human Services Faculty Publications*. Paper 52.
http://ecommons.udayton.edu/edc_fac_pub/52

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An Introduction

Traumatic brain injury (TBI) is the leading cause of death and disability in children and young adults worldwide (World Health Organization, 2006). In the United States, it is estimated that each year, for every 100,000 people, 90 will be hospitalized as a result of a TBI and an additional 465 will visit a hospital emergency department (Coronado et al., 2012). Of the school-aged children in the United States who survive their injury, it has been estimated that 1 in 550 will experience a TBI severe enough to result in a long-term disability (Arroyos-Jurado, Paulsen, Ehly, & Max, 2006). The possible negative effects of TBI can range from mild to severe and can include neurological, cognitive, emotional, social, and behavioral difficulties (Jantz & Coulter, 2007). Within the school setting, the negative effects of TBI tend to persist or worsen over time, resulting in academic and social difficulties that require formal and informal educational assistance (Glang et al., 2008).

The transition process from hospital to school, the school-based assessment of TBI-related educational needs, and the development of TBI-related school-based educational interventions are critical to the academic success of students with TBI. Educational professionals working within the school setting (e.g., school psychologists, teachers) are well-positioned to assist students with TBI and their families navigate through these interrelated processes. However, to do so effectively educators and school-based mental health professionals need a basic working knowledge of TBI—including types of injury; mechanisms of injury; injury severity classification systems; initial and ongoing stages of recovery; setting-specific rehabilitation interventions (in-patient and out-patient); common neurological, cognitive, emotional, behavioral, social, and academic consequences; and common community-based assessment practices, neuroimaging techniques, and neuropsychological test batteries. They also need an effective means for collaborating with parents/guardians, medical professionals, and mental health professionals involved in the recovery, assessment, and care of students with TBI. Finally, educational professionals need a good understanding of how to best conduct a school-based assessment of a student with TBI and translate educational and medical data into effective and appropriate TBI-related school-based interventions.

This book is a comprehensive practitioner-oriented guide to effective school-based services for students who have experienced TBI. It is primarily written for school-based professionals who have limited or no neurological or neuropsychological training; however, it also contains information that is useful for professionals with extensive knowledge in neurology and/or neuropsychology. This book is also written for parents/

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guardians of students with TBI because of their integral role in the transition, school-based assessment, and school-based intervention processes.

This book provides a glossary of common TBI-related terms on the website that accompanies this book. It also incorporates the TBI School-Based Neuroeducational Needs Assessment Process (TBI-SNNAP). The TBI-SNNAP is an author-developed problem-solving approach to neuroeducational needs assessment and school-based intervention development that is based on the Bransford and Stein IDEAL problem-solving model (1993) and the Heartland Area Education Agency ICEL/RIOT assessment process (2005). A variety of evidenced-based educational interventions grounded in Response to Intervention (RtI) theory are also provided in this book, as well as suggestions regarding educational transition based on current TBI rehabilitation research.

Because a book of this type would be incomplete without a discussion on prevention, information is included on how parents, schools, agencies, and the medical community can develop partnerships focusing on prevention; guidelines for developing and implementing in-service training opportunities for school-based and nonschool-based professionals; state and school-based TBI prevention initiatives; and concussion and helmet awareness programs. In addition to being an indispensable resource for parents/guardians, educational professionals working in the schools, and professionals working outside the school setting, this book is an invaluable supplemental book for graduate level training programs in school psychology, special education, educational leadership, school counseling, child and adolescent psychiatry, and the medical field.

Chapter Overview

This introductory chapter will provide an overview of TBI, including

- prevalence rates;
- costs to society;
- becoming aware of students with TBI;
- special education;
- Section 504 of the Rehabilitation Act of 1973;
- support services in rural communities;
- interdisciplinary roles, functions, and responsibilities; and
- interdisciplinary communication and collaboration.

Prevalence Rates

Overall

It is difficult to determine the true overall number of TBIs occurring every year in the United States and around the world for the following reasons:

Inconsistency in treatment location. Injuries that result in a serious TBI (e.g., motor-vehicle traffic/pedestrian injuries, serious assault injuries, injuries obtained in falls from heights) are most likely to be treated at a hospital emergency department (HED), whereas injuries that result in a less serious TBI (e.g., lacerations to the head from blows, concussions) are more likely to be treated in doctors' offices or outpatient facilities

(e.g., clinics, urgent care centers). Because doctors' offices and outpatient facilities are usually not the focus of data collection efforts, TBIs treated at these locations are less likely to be included in reports on the prevalence rate of TBI.

Convenience of data collection. HEDs are the most convenient data collection sites for establishing TBI prevalence rates. This is due to the larger number of visits and their participation in government-sponsored data collection projects. Projects such as the U.S. Department of Health and Human Services Agency for Healthcare Research and Quality's *Healthcare Cost and Utilization Project* (HCUP; 2013), the U.S. Consumer Product Safety Commission's *National Electronic Injury Surveillance System-All Injury Program* (NEISS-AIP; 2013a), and the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics' *National Hospital Ambulatory Medical Care Survey* (NHAMCS; 2013a) are designed specifically to collect hospital and patient information that includes data on HED visits. Therefore, these three sources tend to be major "go to" sources for statistics on TBI rates. It should be noted, however, that not all hospitals participate in all of these programs and some hospitals do not participate in any. Doctor's offices and outpatient facilities are the least convenient data collection sites for establishing TBI statistics due to the smaller number of visits, greater number of locations, and lack of involvement in government-sponsored data collection projects.

Inconsistency in reporting medical diagnosis of head injuries. Currently there is no agreed upon system in place for determining when a head injury warrants a diagnosis of TBI. For instance, the NEISS-AIP (2013) is a database designed to collect patient information from each participating hospital for *all* nonfatal injuries and poisonings treated in U.S. HEDs. As designed, it "includes only the principal diagnosis and primary body part injured and therefore cannot capture TBIs that were secondary diagnoses. For example, skull fractures, which commonly involve TBI, are listed as fractures of the head and not as TBIs" (CDC, 2011, pp. 1341–1342). Subsequently, an NEISS-AIP-affiliated attending physician treating a patient with a gunshot wound to the head may list the primary diagnosis as a "penetrating gunshot wound to the head" rather than "traumatic brain injury resulting from a penetrating gunshot wound to the head." Another example would be an HED attending physician diagnosing a head injury as a skull fracture rather than TBI.

Inconsistency in TBI terminology/definition. There is no consistency in the terminology or definitions used to describe TBI. For example "head injury is still used synonymously with TBI, but in some cases it refers to injury of other head structures such as the face or jaw" (Lezak, Howieson, Bigler, & Tranel, 2012, p. 180). In this case, an injury to the jaw coded as a "head injury" could inadvertently be included in TBI prevalence rate data. The term "concussion" raises similar issues. That is, although a concussion is defined/considered by some to be a form of mild TBI (mTBI; Lezak et al., 2012) there is controversy as to whether there is a physiological basis for postconcussion symptoms (Evans, 2010; Lee, 2007). Therefore, individuals seeking medical attention in an HED for a concussion may or may not be diagnosed/reported as receiving a TBI.

It should be noted, however, that there is recognition that a "clear, concise definition of traumatic brain injury (TBI) is fundamental for reporting, comparison, and interpretation of studies on TBI" (Menon, Schwab, Wright, & Maas, 2010, p. 1637) and serious attempts are being made to correct these inconsistencies. For example, a panel of

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experts who made up the Demographics and Clinical Assessment Working Group of the International and Interagency Initiative toward Common Data Elements for Research on Traumatic Brain Injury and Psychological Health recently proposed a consensus definition of TBI. This statement defines TBI as “an alteration in brain function, or other evidence of brain pathology, caused by an external force” (Menon et al., 2010, p. 1638) and it “reflects the understanding that it is the damage to the brain that matters, and not so [sic] the damage to scalp or skull” (p. 1638). The panel of experts also provided explanatory notes clarifying each component of the definition.

Failure to recognize symptoms when present. There are times when TBI can go untreated due to a failure to recognize TBI symptoms. For instance, a parent who is unaware that their young child received a concussion may mistake their child's loss of appetite and complaints of nausea, headache, and fatigue (common signs of a concussion; CDC, 2013b) as the acute onset of a flu virus and fail to seek medical attention. In an extreme case, the symptoms of a more severe TBI may also be mistakenly overlooked. There is also a widespread lack of awareness of TBI among the general public and medical community, as evidenced by current concussion education programs such as the *Heads Up on Concussion* (for health care professionals and youth and high school sports coaches, parents, and athletes), the *Heads Up: Brain Injury in Your Practice* (for primary care settings), the *Heads Up: What to Expect After Concussion* (for patients), the *Facts about Concussion and Brain Injury: Where to Get Help* (for patients), and the *Updated Mild Traumatic Brain Injury Guidelines for Adults* (acute care settings) programs sponsored by the CDC (2013c, 2013d, 2013e, 2013f, 2013g).

The high cost of medical treatment. It is a well-known fact that medical care is costly. In 2010, approximately 10% of all children under 18 (7.3 million) were without health insurance (Carmen, Proctor, & Smith, 2010). Families who lack sufficient medical insurance or families in poverty may opt to “treat the injury at home” or choose a “wait and see” approach because they cannot afford to take their child to the doctor or HED.

A desire to avoid the involvement of law enforcement or the legal system. Not all who receive a TBI will seek the aid of the medical community; to do so risks the possibility of unwanted attention from law enforcement officials or the legal system. Examples include: adolescent gang members who do not seek medical attention after receiving a severe beating by rival gang members (involving repeated kicks or blows to the head), because it is considered to be a “gang matter, not a police matter” or they fear retaliation if the assault is reported; nondocumented workers who do not seek medical attention after receiving a blow to the head for fear of being reported to immigration officials; and parents who do not seek immediate medical attention for infants who have been shaken or struck, for fear that the offending party will be charged with a crime.

Infants, Children, Adolescents

Available data indicate that every year in the United States motor vehicle traffic incidents (occupant, motorcyclist, pedal cyclist, pedestrian), falls, assaults, and other external causes (e.g., being struck by or against something) will result in an estimated 1.7 million people arriving in HEDs with TBI (Faul, Xu, Wald, & Coronado, 2010). Of these visits, more than

275,000 will be hospitalized, nearly 52,000 will die from their injury, and over half a million (697,347) will be infants, children, and adolescents between the ages of 0 and 19.

While the majority of 0–19-year-olds who arrive at the HED will be treated and released to go home (631,146), the greater the age at the time of the injury, the more likely the injury will result in hospitalization or death. For example, adolescents ages 15–19 are twice as likely to be hospitalized and 1.5 times more likely to die as a result of their injury than are infants and children ages 0–14 (Faul et al., 2010; Shi et al., 2009). These higher rates for adolescents ages 15–19 are likely due to this age groups' increasing propensity to engage in high-risk activities—such as not wearing a seat belt when riding in a car driven by someone else, riding in a vehicle driven by someone who has been drinking alcohol, being involved in a physical fight, carrying a weapon, engaging in competitive contact sports, and using drugs and alcohol (CDC, 2010, 2011; Johnston, O'Malley, Bachman, & Schulenberg, 2011; Shi et al., 2009). Regardless of the age group, males are two to three times more likely to receive a TBI than are females.

Sports and Recreation Injuries

According to the CDC (2011), every year in the United States approximately 2.6 million children and adolescents ages 4–19 will visit an HED for sports- and recreation-related injuries. Of these visits, approximately 7% of the injuries (182,000) will be TBIs. Of these, almost three quarters (136,500) will occur among males and 71% will occur among children and adolescents ages 10–19. The reason the majority of sports- and recreation-related TBIs occurs among ages 10–19 is likely due to any or all of the following:

Physical maturation. As children in this age group mature, there is a noticeable increase in their strength, weight, and speed. When combined with motion-oriented sports (e.g., basketball, hockey) or recreation activities (e.g., sledding, ice-skating) these increases can result in a greater amount of momentum and force of impact, thereby increasing the chance of injury (CDC, 2011; Proctor & Cantu, 2000). For example, consider the difference in increased risk of injury that occurs when a 170-pound high school quarterback is tackled behind the line of scrimmage by an opposing 250-pound tight end during the opponent's homecoming game—compared to two 50-pound 8-year-olds in a similar situation during a game of pee-wee football on a Saturday afternoon.

High-risk activities. For this age group there is an increased involvement in off-ground sports (e.g., gymnastics, rodeo) or recreation activities (e.g., horseback riding, trampolining) that combine momentum, speed, mass, and height, that can lead to TBI, as is the case when a gymnast falls during a routine on the pommel horse or uneven bars or a person falls to the ground while executing a backflip on the neighbor's trampoline. There is also increased involvement in high-risk wheeled sports (e.g., freestyle biking, freestyle skiing) and recreation activities (e.g., skateboarding) that encourage and value stunts and tricks, also increasing risk of TBI, as is the case when a participant falls during a freestyle biking, half-pipe routine.

Risk rating. In rank order, the top five sports and recreation activities that account for the majority of nonfatal TBI-related HED visits under the age of 19 are: bicycling, football, playground activities, basketball, and soccer (CDC, 2011). The top five, rank-ordered sports and recreation activities for males and females ages 10–19 are shown in Table 1.1.

Table 1.1 Top five, rank-ordered activities accounting for nonfatal TBI hospital emergency department visits for males and females ages 10–19

Sex/Rank	Age group (yrs)				
	≤ 4 No. (%)	5–9 No. (%)	10–14 No. (%)	15–19 No. (%)	≤ 19 total No. (%)
Male					
1	Playground 3,187 (35.3*)	Bicycling 5,997 (23.6)	Football 8,988 (20.7)	Football 13,667 (30.3)	Football 24,431 (19.9)
2	Bicycling 1,608 (17.8)	Playground 4,790 (18.9)	Bicycling 8,302 (19.1)	Bicycling 4,377 (9.7)	Bicycling 20,285 (16.5)
3	Baseball 656 (7.3)	Baseball 2,227 (8.8)	Basketball 4,009 (9.2)	Basketball 4,049 (9.0)	Playground 9,568 (7.8)
4	Scooter riding 460 (5.1)	Football 1,657 (6.5)	Baseball 3,061 (7.0)	Soccer 3,013 (6.7)	Basketball 9,372 (7.6)
5	Swimming 429 (4.8)	Basketball 1,133 (4.5)	Skateboarding 2,613 (6.0)	ATV riding 2,546 (5.6)	Baseball 8,030 (6.5)
Other	2,680 (29.7)	9,558 (37.7)	16,476 (37.9)	17,488 (38.7)	51,284 (41.7)
Total	9,020	25,362	43,449	45,140	122,970
Rate* (95% CI)	86 (61–112)	248 (182–313)	410 (316–504)	417 (323–512)	292 (225–360)

Female					
1	Playground 2,297 (47.8)	Playground 3,455 (30.3)	Bicycling 2,051 (12.2)	Soccer 2,678 (16.0)	Playground 7,136 (14.2)
2	Bicycling 775 (14.4)	Bicycling 2,361 (20.7)	Basketball 1,863(11.1)	Basketball 2,446 (14.6)	Bicycling 5,928 (11.8)
3	Baseball 321 (6.0)	Baseball 541 (4.7)	Soccer 1,843 (11.0)	Gymnastics [§] 1,513 (9.1)	Soccer 4,767 (9.5)
4	Trampolining 261 [†] (4.8)	Scooter riding 525 (4.6)	Horseback riding 1,301 (7.7)	Softball 1,171 (7.0)	Basketball 4,615 (9.2)
5	Swimming 257 (4.8)	Swimming 504 (4.4)	Playground 1,041 (6.2)	Horseback riding 1,028 (6.2)	Horseback riding 2,853 (5.7)
Other	1,275 (23.7)	4,006 (35.2)	8,724 (51.9)	7,872 (47.1)	25,011 (49.7)
Total	5,386	11,391	16,824	16,709	50,310
Rate [‡] (95% CI)	54 (34–74)	117 (87–146)	167 (130–203)	163 (122–204)	126 (96–155)

Data: National Electronic Injury Surveillance System—All Injury Program, United States, 2001–2009

Note: Reprinted from “Nonfatal traumatic brain injuries related to sports and recreation activities among persons aged <19 years—United States, Surveillance Summaries, 2001–2009.” U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC, 2011), *Morbidity and Mortality Weekly Report (MMWR)*, 60, pp. 1337–1342.

Abbreviations: ATV = all-terrain vehicle; CI = confidence interval.

* Percentages might not sum to 100% because of rounding.

[†] Per 100,000 population.

[§] Includes cheerleading and dancing.

[‡] Estimate might be unstable because the coefficient of variation is > 30%.

Costs to Society

The costs associated with TBI are both monetary and human. A recent study (Kayani, Homan, Yun, & Zhu, 2009) estimated that in Missouri during 2005 the direct costs for TBI-related HED visits and hospitalizations were \$111 million. In its report to Congress on mTBI, the National Center for Injury Prevention and Control (2003) reported that the costs associated with the treatment of mTBI were \$17 billion each year. The economic costs associated with TBI for 2010 were estimated to be \$76.3 billion (Coronado, McGuire, Faul, Pearson, & Sugerma, 2012). In 2003, based on data reported by the Healthcare Cost and Utilization Project using the KID database compiled in 2000, it was estimated that 50,658 children in the United States under the age of 18 were hospitalized for a TBI-related injury at a cost of more than \$1 billion in inpatient charges, making it the fifth most expensive hospital diagnosis for children (Schneider, Shields, Hostetler, Xiang, & Smith, 2006).

The human costs of TBI are difficult, if not impossible, to measure. While some of the consequences of TBI (social, emotional, neurological, cognitive, and behavioral indicators) may be measured in terms of a score on an assessment instrument or by comparing performance to an established norm group, the costs of those consequences to the individual or to those with whom he/she comes in contact are not easily quantified. It is difficult, if not impossible, to measure the costs of the personal, familial, or collegial grief/loss that can occur in an instant, but last a lifetime. It is also difficult, if not impossible, to measure the costs associated with a change in personality; short-term memory loss; partial paralysis; interpersonal conflict; parental stress; feelings of helplessness or hopelessness that comes with 24-hour care; decreases in academic performance; withdrawal from friends and family; or uncontrollable headache, fatigue, or nausea. While these costs (and a myriad of others) may not be easy to measure, they are not hard to imagine. Those who experience them will tell you the cost is high.

Becoming Aware of Students With TBI

How a student with TBI comes to the attention of school professionals (e.g., psychologist, school counselor, teacher) varies. For example, parents/guardians can inform school professionals at prearranged formal meetings, which generally occur at or about the time the student is returning to school; under less formal circumstances (e.g., during back-to-school-night meetings, during encounters at grocery stores); or during the background medical history portion of a special education eligibility evaluation interview, when the school psychologist asks: "Has your child ever received a head injury?" or "Has your child ever been admitted to the hospital?" or "Has your child ever had a concussion?" Community and hospital professionals (e.g., medical professionals, physical therapists, licensed psychologists, speech-language pathologists) involved in the care of students with TBI can also inform school professionals after obtaining parent permission to do so. When this happens, it is done when the students transition from hospitals or rehabilitation centers back into the school setting.

There are times when a school professional may become aware of a student's TBI through personal interactions with the student. For example, the student may inform school professionals that he/she has sustained a TBI in a "life history" or "what I did over

the summer" writing sample; a teacher may notice that a recently arrived transfer student from another state is complaining of severe headaches and frequently appears to "day-dream" in his 9th-grade math class; or a football coach may notice that during strength-training exercises a student has significant left-sided weakness and on the football field he doesn't seem to "see" his opponent whenever his opponent comes from the left side. While these latter two examples are not in-and-of-themselves indicative of TBI, they can be of significant enough concern to cause the school professional to begin asking the student questions or begin consulting with the school psychologist or nurse—who then interviews the parent/guardian. Finally, there are also times when school professionals become aware of a student's TBI prior to his/her arrival at school via local newspaper articles, TV news reports, or third-party report by persons "in the know."

Special Education

According to the Technical Assistance Coordination Center child count data (<http://tadnet.public.tadnet.org/pages/712>), more than 6.5 million students across the United States between the ages of 3 and 21 are receiving special education services under a special education disability category. Of these, approximately 25,000 students were receiving services under a special education category of Traumatic Brain Injury. This number, however, does not reflect the number of students with TBI who were receiving special education services under a different special education category (e.g., Other Health Impaired); did not meet minimal special education eligibility criteria, but still had educational, behavioral, or emotional deficits/needs; or sustained a TBI, but were never brought to the attention of the special education multidisciplinary assessment team.

The Individuals with Disabilities Education Improvement Act of 2004 (IDEIA 04) obligates all public schools receiving federal funding to identify, locate, and evaluate all children with disabilities, ages birth–21, who are in need of special education services or early intervention; regardless of the severity of their disabilities. Known as "child find" (IDEIA 04; U.S. Federal Register, 2006, p. 46764), this process includes children with disabilities who are homeless, wards of the state, highly mobile (including migrant children), and/or children with disabilities attending private schools (including religious schools). Child find also stipulates that children who are suspected of having a disability and in need of special education be identified, located, and evaluated, even if they are advancing from grade to grade.

Within IDEIA 04, and related to the child find provision, is a provision that allows for "early intervention services." These early intervention services apply specifically to infants and toddlers with disabilities from birth through the age of 2 who:

are experiencing developmental delays, as measured by appropriate diagnostic instruments and procedures in 1 or more of the areas of cognitive development, physical development, communication development, social or emotional development, and adaptive development; or have a diagnosed physical or mental condition that has a high probability of resulting in developmental delay. (IDEIA 04, 2005, p. 100)

Early intervention covers a wide variety of services, including family training, counseling, and home visits; special instruction; speech-language pathology and audiology

services; sign language and cued language services; occupational therapy; physical therapy; psychological services; service coordination services; medical services for diagnostic or evaluation purposes; early identification, screening, and assessment services; health services necessary to enable the infant or toddler to benefit from the other early intervention services; social work services; vision services; assistive technology devices and assistive technology services; and transportation and related costs that are necessary to enable an infant or toddler and their families to receive any of these services.

TBI became an official special education disability category in 1990, when the 1975 Education for All Handicapped Children Act (EHA) was reauthorized by the U.S. Congress and became the Individuals with Disabilities Education Act (IDEA; 1990). The official special education definition for TBI was codified in 1992 and reads:

Traumatic brain injury means an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psycho-social behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma.

(U.S. Department of Education, 1992, p. 44802)

Once infants, children, or adolescents with TBI are identified through child find, schools are obligated under IDEA 04 to locate and evaluate them in order to determine if there is a need for special education and related services designed "to meet their unique needs and prepare them for further education, employment, and independent living" (IDEIA 04, §601(d)(1)(a), p. H.R. 1350-1355) or a need for early intervention services designed to "meet the developmental needs of an infant or toddler with a disability" (IDEIA 04, §632(4)(c), p. H.R. 1350-1399). If, following a multidisciplinary team evaluation in the area of suspected disability, it is determined by the Individualized Family Service Plan (IFSP) team (age < 3) or the Individualized Education Program (IEP) team (ages 3-21) that the infant, child, or adolescent needs services, services must be provided at no cost to the family. Early intervention services for infants and toddlers are delineated by an IFSP and special education and related services are outlined in an IEP. Although infants and toddlers with TBI receive early intervention services under the umbrella of IDEA 04, they do not receive a special education classification label. Children and adolescents with TBI receive services under the Traumatic Brain Injury special education label, beginning at age 3. It should be noted that although child find is designed to identify, locate, and evaluate children with disabilities as early as birth in order to help ensure their unique needs are met and the infant is prepared for further education, employment, and independent living, many parents/guardians of infants with TBI do not think to contact school child find personnel at the time of the injury; nor is the medical community under any legal obligation to notify public schools when an infant receives a TBI.

Underrepresentation in Special Education

Given that each year in the United States more than 44,000 school-aged children and adolescents (5–19) are hospitalized as a result of TBI (Faul et al., 2010), it is likely that the approximately 25,000 K-12 students who receive special education services each year under a Traumatic Brain Injury disability category (Technical Assistance Coordination Center, 2011) greatly underrepresents the true number of students with TBI who require special education and/or related services. Possible reasons for underidentification include:

Age at the time of injury. Depending on the age of the child at the time of the TBI, parents/guardians may not yet be thinking about their child's educational needs. Therefore, they may not seek out services available under IDEIA 04. Consider for example the parents of a ten-month-old infant who sustains a moderate TBI after a 3-foot fall from a patio deck onto a concrete sidewalk. As their infant leaves the hospital and begins her course of improvement/rehabilitation, it is likely that her parents will not be thinking about her entering school in five years. However, when the time does come, their daughter may have been meeting major milestones within reasonably expected time frames and appearing to learn without difficulties. In consequence, because she appears to be functioning normally, her parents/guardians may not think it is important to inform school professionals that she sustained a TBI five years earlier (see Case Study 6.1—Josiah; Moderate TBI). The effects of age of injury on outcome will be discussed in greater detail in chapters 5, 6, and 7.

Measurable learning difficulties may be delayed. To be eligible for special education under IDEIA 04, a student's TBI must have an adverse effect on educational performance. However, there are times when the adverse effect of TBI on educational performance may be delayed. For example, it may take months before the cumulative effects of less severe short-term memory difficulties or unrelenting headaches begin to have an adverse effect on a student's academic progress. There are also times when it may take years before the effects become apparent, as can be the case when early damage to a later maturing region of the brain occurs. For example, a student in kindergarten might sustain damage to the frontal regions of the brain (one of the last areas to mature); however, the effects of the injury might not become evident until later grades when the effects of the early injury (failure to acquire foundational sequential decision-making competencies) result in impaired planning and organization skills. In cases like these, a student may not immediately demonstrate the required "adverse effect on educational performance" that otherwise qualify the student for special education services.

Misclassification/Misattribution. At the time of their TBI, some students may have already been receiving services under a special education category (e.g., significant learning disability). In these cases, some special education multidisciplinary teams may feel that the student would not benefit by changing the classification to TBI. In other cases, a student's TBI-related behavior may be misattributed to other causes (see chapter 4) and the child may be misclassified under a different classification category (e.g., emotionally disturbed).

Other. Although figures are not available for any of the following, a portion of those hospitalized will (a) sustain a severe enough TBI that they will not be able to return to/enter the educational system, (b) will return/enter with no significant adverse effect on educational performance, or (c) will have their educational needs met with a Section 504 Accommodation Plan (see below).

Section 504 of the Rehabilitation Act of 1973

In the United States, Section 504 of the Rehabilitation Act of 1973 (Section 504) was established, in part, to protect the rights of individuals with disabilities. It applies to all programs and activities that receive federal financial assistance, including federal funds. Under Section 504, schools that receive funds from the U.S. Department of Education are required to provide a free and appropriate education (FAPE) to qualified school-age individuals with a disability in their jurisdiction, regardless of the nature or severity (<http://www2.ed.gov/about/offices/list/ocr/docs/edlite-FAPE504.html#note1>). A student with a disability under Section 504 has a physical or mental impairment which substantially limits one or more major life activities (e.g., learning), has a record of such an impairment, or is regarded as having such an impairment. It is important to note, however:

in public elementary and secondary schools, unless a student actually has an impairment that substantially limits a major life activity, the mere fact that a student has a “record of” or is “regarded as” disabled is insufficient, in itself, to trigger those Section 504 protections that require the provision of a free appropriate public education (FAPE). (<http://www2.ed.gov/about/offices/list/ocr/504faq.html>, Q 37)

A student is determined to qualify under Section 504 by a team of knowledgeable individuals, including the parents, who are familiar with the student and his/her disability. If a student with TBI meets the eligibility requirements for Section 504, he/she will be entitled to reasonable accommodations or the reasonable modification of policies, practices, or procedures, and a Section 504 Accommodation Plan will be developed. The following are examples of possible accommodations for students with TBI (U.S. Department of Education, 2010):

- arranging for a health care and emergency plan;
- providing extended school year/time;
- furnishing memory/organizational aids;
- providing alternative testing;
- initiating tutoring programs;
- educating staff and peers about TBI; and
- implementing an academic monitoring process.

All students with TBI who meet the eligibility requirements under IDEIA 04 also meet the eligibility requirements for Section 504; however, a student can meet eligibility for Section 504 but not IDEIA 04.

Support Services in Rural Communities

Compared to families living in urban and suburban areas, families in rural communities often do not have ready access to hospital trauma departments, neurological rehabilitation centers, mental health services, and/or residential treatment centers. In addition, when these services are available, they often have inadequate staffing, equipment, and poor transportation services (Galynker et al., 2000; Gamm, Hutchison, Dabney, & Dorsey, 2010). Further complicating factors include geographic barriers, resource constraints, and a shortage of qualified medical professionals and other essential personnel (Bray, 2001; Office of Technology Assessment, 1989; Stamas, 1997; Williams, Ehrlich, & Prescott, 2001). Despite these shortcomings, research indicates that TBI demographics, injury severity variables, neuropsychological abilities, and rehabilitation outcomes are generally similar to urban areas (Johnstone et al., 2003; Mazurek et al., 2011). One possible advantage students with TBI have living in rural settings, as opposed to students living in urban or suburban settings, is that rural settings may provide students with TBI more opportunities to get away from daily pressures and live at a more relaxed pace that accommodates fatigue (Jones & Curtin, 2010).

Interdisciplinary Roles, Functions, and Responsibilities

Depending on the TBI severity level, students who return to school often experience a predictable range of educational and social-emotional difficulties (Fulton, Yeates, Taylor, Walz, & Wade, 2012). The medical community, neuropsychological/psychological community, educational community, and parents/guardians play important roles, serve important functions, and have unique responsibilities during the transition, school-based assessment, and educational intervention of these students. While it would be inappropriate to dictate the role, function, and responsibility of each of these groups, some general assumptions regarding these can be made.

Medical Community

The general educational role of medical professionals in the transition, school-based assessment, and educational intervention for students with TBI is to provide parents/guardians and school-based multidisciplinary teams with useful information regarding the medical nature of a student's TBI. That is, they can provide medical reports and supporting medical records that describe and define the nature of a student's injury (including any physical injuries not related to the brain). Their general educational function is to identify an injury to the brain and officially indicate that the student sustained a TBI. In general, their educational responsibility is to provide supporting documentation, in nontechnical, jargon-free language. They also have a general responsibility to make themselves available for consultation and, if necessary, attend multidisciplinary team meetings.

Neuropsychological and Psychological Community

The general educational role of neuropsychological and psychological professionals in transition, school-based assessment, and educational intervention processes is to provide

parents/guardians and school-based multidisciplinary teams with useful information regarding the TBI-related neurological, cognitive, and social-emotional strengths, weaknesses, and limitations of the student. Their general educational function is to identify how these strengths, weaknesses, and limitations are related to the student's TBI and how they might affect a student's ability to learn in the educational setting. Similar to the medical community, their educational responsibility is to provide supporting documentation, in nontechnical, jargon-free language, and their more general responsibility is to make themselves available for consultation and, if necessary, attend multidisciplinary team meetings.

Parents/Guardians

The general educational role of parents/guardians in the transition, school-based assessment, and educational intervention processes is to inform schools that their infant, child, or adolescent sustained a TBI, provide insight into pre-TBI functioning, and assist school-based multidisciplinary teams in the development of educational interventions. Their general educational function is to help school-based multidisciplinary teams understand pre-injury life for the student in the areas of neurological, cognitive, social-emotional, and overall educational functioning.

Schools and School Personnel

The school, and those professionals working within the school, plays a crucial role in facilitating a student's transition to the educational setting from the hospital/rehabilitation facility, assessing the educational impact of a student's injury, and providing evidence-based interventions (Harvey, 2006). The general role of the school/school professionals in the transition, school-based assessment, and educational intervention for students with TBI is twofold. One role is to help students with TBI transition into the educational setting in the most efficient manner. The other role is to determine, within the guidelines of IDEIA 04/Section 504, whether or not the neurological, cognitive, and/or social-emotional consequences of a student's TBI are adversely affecting the student's ability to be successful within the educational setting. The function of the school/school professionals is to help students with TBI access appropriate educational services within the school setting and to provide educationally-focused social, emotional, and behavioral support. In general, their responsibilities include collaborating with other professionals, parents/guardians, and agencies; providing thorough and timely evaluations; and developing appropriate interventions designed to help students with TBI become more successful in their education.

Interdisciplinary Communication and Collaboration

Depending on the severity level of the TBI, a student with TBI may be simultaneously receiving injury-related services from a number of different community-based disciplines. These services may be specifically designed to address TBI deficits (e.g., training to enhance memory deficits), TBI-related physical injuries obtained at the time of injury (e.g., physical therapy for a torn rotator), or both. Therefore, a student with TBI could be under the care of a psychiatrist, neurologist, neuropsychologist, psychologist, speech

pathologist, physical therapist, and/or an occupational therapist. Once students have entered/reentered the educational setting they may also receive school-based services from a school psychologist, school counselor, speech-language pathologist, occupational therapist, physical therapist, and/or special education teacher. In order to reduce redundancy of services and avoid any ethical/legal problems in the delivery of services, communication/collaboration between all professional disciplines involved in helping a student with TBI is critical. To be effective, communication/collaboration needs to involve two-way consultation, dialogue, and exchange of relevant student information. In an ideal world, communication/collaboration between service providers is frequent and robust; in the real world, this is not always the case. While it is the responsibility of each professional involved to ensure that communication/collaboration occurs with other disciplines, this will only happen when there is awareness by each professional that additional service-providers are involved. The importance of interdisciplinary communication/collaboration and guidelines for those involved (including parents/guardians) will be further discussed in chapters 8 and 10.