A Manual for Caregivers of Infants and Young Children Who are at Risk for or Have Experienced a TBI: Prevention and Education

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A MANUAL FOR CAREGIVERS OF INFANTS AND YOUNG CHILDREN WHO ARE AT-RISK FOR OR HAVE EXPERIENCED A TBI: PREVENTION AND EDUCATION

by

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A Scholarly Project
Submitted to the Occupational Therapy Department of the University of North Dakota
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The Scholarly Project Paper, submitted by Meghan Enabnit, MOTS and Stephanie Gubbels, MOTS, in partial fulfillment of the requirement for the Degree of Master's of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

Faculty Advisor

Date

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Title A Manual for Caregivers of Infants and Young Children Who Are At-Risk For or Have Experienced a TBI: Prevention and Education

Department Occupational Therapy

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ABSTRACT

The prevalence of infant TBI, 0 to 4 years of age, is one of the highest population groups to experience TBI (Faul, Xu, Wald, & Coronado, 2010). The age group between 0-4 years old has contributed to 251,546 emergency department visits, 15,239 hospital visits, and 998 deaths (Faul et al., 2010). The purpose of this scholarly project is to increase awareness and knowledge of infant and young child traumatic brain injury across all contexts, to reduce incidence of traumatic brain injury and re-injury and to promote development for the vulnerable, at-risk, infant and young child population through the creation and implementation of a caregiver manual.

A comprehensive literature review was completed to identify the main causes, risk factors, types, severity, and symptoms of traumatic brain injury in young children. The authors also met with the director of Safe Kids to discuss current preventative measures and obtained useful information about safety, prevention and education for parents and caregivers. Principles of the adult learning models and the occupation-based model, Person-Environment-Occupation (PEO, Strong & Gruhl, 2010), were used as a guide in developing the caregiver manual. The emphasis of PEO on person, environment and occupation is illustrated through the three areas the occupational therapists address equally within the caregiver manual: the caregiver, home context, and the caregiver’s ability to care for the child.

The product of this scholarly project is a caregiver manual with the purpose of reducing the prevalence of TBI in infants and young children and educating parents on
safety techniques. The caregiver manual is made up of two sections; the first section focuses on prevention and education for parents and caregivers with vulnerable, at-risk infants and young children and the second section focuses on prevention and education for parents and caregivers with injured, at-risk infants and young children. Preventative techniques are a cost-effective way to provide treatment and avoid injury. The caregiver manual is intended for use and implementation in various regions in the United States to prevent TBI and reduce the national prevalence rate.

Currently, the literature on intervention and treatment for infants and young children who experience TBI is limited, especially in the area of occupational therapy. This supports the creation of a preventative and educational caregiver manual for occupational therapists to utilize as a part of intervention. It is also recommended that the manual be piloted by occupational therapists who are willing to collect data on the effectiveness of the use of the materials in the manual. It is further recommended that future research be completed on the role of occupational therapy with this population.
CHAPTER I
INTRODUCTION

In the United States more than 1.7 million people experienced a traumatic brain injury (TBI) each year, and among this population the highest prevalence occurred in the age group of 0 to 4 years old (Faul, Xu, Wald, & Coronado, 2010). However, currently there is a lack of evidence-based research in the area of occupational therapy in treating this population who has experienced a TBI.

Findings from a review of current research and literature, presented in Chapter II, indicate a lack of evidence-based research on occupational therapy based interventions for the 0 to 4 year old population who has experienced a TBI. However, research does indicate the effectiveness of prevention and education in reducing incidence of infant and young children experiencing TBI. The leading causes of infant TBI are falls, abuse, and motor vehicle accident (Stewart et al., 2011). These leading causes are often due to ignorance or lack of knowledge in how to care for a child, which can easily be reduced by educating and training caregivers on the risks and preventative techniques of infant traumatic brain injury.

The product of this scholarly project is a manual designed for occupational therapists to use as a tool to promote TBI prevention and to use as part of an intervention program when working with caregivers and their children who have experienced a traumatic brain injury at a young age. The manual contains preventative and educational information, which was developed for caregivers and parents.
The purpose of the manual is to increase awareness and knowledge of infant and young child traumatic brain injury across all contexts, reduce incidence of traumatic brain injury and re-injury and to promote development for the vulnerable, at-risk, infant and young children population.

The Person-Environment Occupation (PEO) Model guided the development of the product of the scholarly project: *A Manual for Caregivers of Infants and Young Children Who Are At-Risk for or Have Experienced a TBI: Prevention and Education.*

PEO encompasses the three areas of the person, environment, and occupation in guiding the assessment and intervention process. Within the PEO model the person is defined as physiological, psychological, neurobehavioral, cognitive and spiritual factors intrinsic in nature (Christian & Baum, 2008; Crepeau, Cohn, Schell, 2009). The Environment is defined as physical, cultural, natural, societal, institutional and social interactive factors. The social and economic factors are extrinsic in nature; occupational performance takes place with time, space and place (Christian & Baum, 2008; Crepeau, Cohn, Schell, 2009). Occupation is defined as what a person wants or needs to do in everyday life. These tasks are meaningful, goal-directed pursuits which include abilities, tasks, actions, occupations, social/occupational roles. Occupations are self-directed tasks that a person engages in over the life course. The interaction of these three factors, person, environment, and occupation are encompassed within occupational performance and are dynamic in nature. The outcome of PEO is to increase the quality of life of the infant across the lifespan by changing factors associated with the caregiver, the home environment, and the occupation of care giving (Christian & Baum, 2008; Crepeau, Cohn, Schell, 2009). PEO is therapist driven and involves therapist analysis of function/dysfunction in all three
areas: person, environment, and occupation. The therapist determines what area needs to be addressed in order for the client to achieve function in occupational performance across the lifespan.

Strong, et al. (1999) analyzed the Person-Environment Occupation (PEO) model and described how the PEO offers occupational therapists a tool to facilitate client engagement in meaningful occupations within their desired environments. The key term occupational performance is defined as the relationship between person, occupation, and environment. Occupational therapists using the PEO model begin by identifying occupational performance strengths and problems. After performance strengths and problems are identified, performance components, occupation, activities and tasks, and environmental considerations are assessed. After assessing these areas, the information is brought together to develop an intervention plan with the client. Through measuring occupational performance, the outcome is evaluated. The focus of this model is to improve the PEO fit in order to enable occupation (Strong, Rigby et al. 1999).

The focus of the occupational therapist is to facilitate maximizing the fit of the caregiver, home context, and the caregiver's ability to care for the child in order to increase positive occupational performance in the parenting role (Strong & Gruhl, 2010). When assessing the person, these are some factors to keep in mind: interests and values, sensory and motor abilities, decision-making, problem solving, and finances. Factors within the environment to keep in mind are resources available from the hospital and at home, physical characteristics of home and community, and friends. Factors within occupation are the occupation itself, time demands, and organizational and physical requirements of occupation (Strong, Rigby et al. 1999). Task analysis is another key
aspect of PEO that allows the therapist to break down the components of the activity. The second section of the product includes an activity analysis of the infant and young child’s occupations of feeding and eating, sleeping, play, and toileting. Through this activity analysis, the caregiver/s are then educated on ways to facilitate healthy development in their child in these areas of occupation. After the client identifies his or her needs and priorities, the therapist is able to collaborate with the client in order to select a treatment plan that best suits them. Another interesting aspect of PEO is that it looks at the person, occupation, and environment across the lifespan. The caregiver, home context, and the caregiver’s ability to care for the child are the three areas the occupational therapist address equally within the caregiver manual. This model will allow the therapist to identify which factor is affecting performance and address the occupation, environment and person demands in order to maintain balance and increase functional performance for the infant.

As stated earlier, a review of current research and literature is presented in Chapter II of this project. The methods and steps used to transform the information from the literature and gather additional related information from sources to develop the product are described in chapter III. The components and implementation of the product is described in detail in chapter IV. Chapter V summarizes the findings of the project and discusses recommendations and limitations of the product.
CHAPTER II

REVIEW OF LITERATURE

Introduction

Infants are among the most prevalent age group to sustain traumatic brain injury (TBI), however there is a lack of evidence-based research on occupational therapy interventions for this population. Current research exists on treatment for adult TBI, however the literature cannot be generalized towards the infant population because they have not met all the neurodevelopmental stages that adults have. The age group between 0-4 years old has contributed to 251, 546 emergency department visits; 15, 239 hospital visits; and 998 deaths each year in the United States (Faul, Xu, Wald, & Coronado, 2010). In the United States, there are approximately 1,400 cases a year of TBI in young children due to abuse (Brain Injury Association of America, 2012b). The product of this scholarly project is a manual designed for occupational therapists to use as a tool to promote TBI prevention and to use as part of an intervention program when working with caregivers and their children who have experienced a traumatic brain injury at a young age. The manual contains preventative and educational information, which was developed for caregivers and parents. The purpose of the manual is to increase awareness and knowledge of infant and young child traumatic brain injury across all contexts, reduce incidence of traumatic brain injury and re-injury and to promote development for the vulnerable, at-risk, infant and young children population.
Overview of TBI

The Brain Injury Association of America (2012) defined the term TBI as

An insult to the brain, not of a degenerative or congenital nature but
caused by an external physical force, that may produce a diminished or
altered state of consciousness, which results in an impairment of cognitive
abilities or physical functioning. It can also result in the disturbance of
behavioral or emotional functioning. These impairments may be either
temporary or permanent and cause partial or total functional disability or
psychosocial maladjustment.

Infants are a high-risk population due to their vulnerability and inability to control
their living environments. Unfortunately, one of the top two causes of TBI and death of
an infant is related to child abuse, specifically shaken baby syndrome (SBS). It is
common for infants who are victims of SBS to live in home environments with
uneducated inadequate caregivers and parents, stressful caregivers with poor coping
skills, substance abuse, and economic strains and poverty (MacDonald & Helfrich, 2001).
New parents who resort to child abuse lack the coping skills necessary to manage the new
lifestyle adjustment of taking care of and being responsible for a new baby. It is the role
of occupational therapists to educate and use preventative techniques when working with
new parents and caregivers in order to decrease the prevalence of TBI among this
vulnerable infant population.

Etiology and Incidence

In the United States there are more than 1.7 million people who sustain a
traumatic brain injury (TBI) each year and the highest prevalence and risk is between the
ages of 0-4 (Faul, Xu, Wald, & Coronado, 2010). Among the infant population, the highest incidence of a brain injury caused by a fall or non-accidental incident is for white males. A third of all injury related deaths annually in the United States is attributed to TBI. Boys are 1.5 times more likely to sustain an injury than girls. The leading causes in infant TBI are falls, abuse, and motor vehicle accident. Shaken baby syndrome is the number one non-accidental injury among the infant population and results in intracranial and intraocular trauma often as a result from subdural hematomas, retinal hemorrhages, and diffuse axonal injury (Stewart et al., 2011).

Risk Factors

Young children from birth to the age of 4 are the most vulnerable group in experiencing abuse (Walls, 2006). In MacDonald & Helfrich’s (2001) study, data showed that men were found to be 2.2 times more likely to abuse infants. After men, babysitters were found to be the second group most likely to abuse infants. Mothers of the child were reported to be the least likely to abuse infants (MacDonald & Helfrich, 2001). It has also been found that there is a predominance of male victims compared to female victims with inflicted TBI (Adamo, Drazin, Smith, & Waldman, 2009). Among the infant population with inflicted TBI, the races from the most affected to the least affected are as follows: Caucasians at 63%, African Americans at 28.1%, Hispanic or Latinos at 5.5%, and Asians at 2.6% (Adamo et al., 2009).

The main types of risk factors that lead to SBS are community-related, parent-related, and child-related. Community risk factors for SBS are families living in communities with: high crime rates, high poverty rates, high unemployment rates, and lack of social services. Parent-related risk factors for abuse include: personal history of
being abused, teenage parents, single parents, emotional immaturity, poor coping skills, low self-esteem, personal history of substance abuse, known history of child abuse, inappropriate expectations of child development and needs, lack of social support, social isolation of the family, history of domestic violence, lack of parenting skills, lack of family cohesion, history of depression, history of mental illness, multiple young children, unwanted pregnancy, and denial of pregnancy (MacDonald & Helfrich, 2001; Walls, 2006). Child-related risk factors linked with SBS are prematurity, low birth weight, and developmental or mental disabilities in the child (MacDonald & Helfrich, 2001; Walls, 2006).

According to Walls (2006) there is a reduced risk of injury when the following protective factors are present: stable family relationships, supportive family environment, parental employment, nurturing parenting skills, rules are set and close monitoring of the child, caring and supportive adults outside the family to serve as mentors and role models, adequate, stable housing, access to healthcare and social services, and community support of abuse prevention program.

Types of Injuries

The two main classifications of TBI, which an infant may experience, are closed and opened injuries. A closed brain injury is diffuse and affects multiple areas of the brain. Open brain injuries are focal or localized injuries (Brain Injury Association of America, 2012c). The types of traumatic brain injuries an infant may endure include: diffuse axonal injury, shaken baby syndrome, concussion, and contusion. A contusion is caused by a direct impact to the head resulting in a localized injury and bleeding of the brain. Diffuse axonal injury is caused by a strong rotation of the head by a physical force
such as a motor vehicle accident, blow to the head, or shaken baby syndrome. This strong physical force causes tears in the nerve structures of the brain, which result in concussion, coma, permanent brain damage or death. When an infant experiences a concussion it is usually due to a fall commonly from a countertop or bed. Infants sustain bumps to the head often and if they hit their head hard enough it can result in a concussion. Unfortunately, it is difficult to determine when a hit to the head is severe enough to complete a concussion assessment due to the infant’s inability to communicate feelings of amnesia or nausea, primary symptoms of a concussion. As a preventative measure to reduce further complications, a child who has experienced any bumps to the head, despite the severity of physical injury, should be assessed by their primary physician (Brain Injury Association of America, 2012a).

Infants with TBI can experience a range of mild, moderate, and severe brain damage. The level of severity of the brain injury will impact a young child’s symptoms, functional outcomes, and type of services they will receive. Infants and young children who experience a moderate to severe TBI will experience more deficits over a longer period of time when compared to young children who experience mild TBI. Those who experience severe TBI during early childhood face decreased intellectual function and increased behavioral problems (Anderson, Catroppa, Godfrey, & Rosenfeld, 2012). Children who experience a severe TBI earlier in childhood experience greater deficits than children who experience a severe TBI in late childhood. Children who experience a severe TBI in early childhood display both implicit and explicit memory problems; whereas, children who experience a severe TBI in late childhood only display explicit
memory impairments. This research indicates early brain insult is associated with worse functional outcome due to the vulnerability model (Lah, Epps, Levick, & Parry, 2011).

In Ciurea, Gorgan, Tascu, Sandu, and Rizea’s (2011) study, types of TBI among infants and toddlers between the ages of zero and three were identified using information over a ten-year period at First Department of Neurosurgery and Pediatric Intensive Care Unit. The most common head injuries between 1999 and 2009 were the following in the order of highest prevalence to least prevalent: linear skull fracture, diastatic skull fracture, depressed skull fracture, cephal-hematoma, extradural hematoma, grow skull fracture, depressive skull fracture, subdural hematoma, and penetrating head injury (Ciurea et al., 2011). The types of lesion one experiences affect their assessment and treatment plan process.

Deficits

Infants who experience a TBI will encounter physical, psychosocial, and cognitive deficits and it is within the first year after a TBI that many of these challenges begin to arise. There is a concern that young children with TBI are not getting services and that they have unmet needs because services are not being recommended by a doctor, or recommended and provided by school, and because of the high cost of service provision (Slomine et al., 2006).

Developmental milestones play a large role in the timeframe, intensity, and approach to services with the infant TBI population. Younger children who experience a TBI are more vulnerable to having impairments than older children because of continued change and growth during the early developmental years (Cronin, 2001). As a child ages, more deficits will become apparent due to the increased environmental demands and
evolving developmental skills. The impairments that are associated with someone who experiences a TBI are decreased motor control, orthopedic impairments, somatosensory impairments, sensory system impairments, cardiopulmonary impairments, psychosocial and behavioral impairments, and communication impairments (Cronin, 2001).

*Physical deficits*

Symptoms that infants and toddlers experience are related to the type of lesion he or she experiences in the brain as a result of their TBI. Common symptoms include rapid loss of consciousness, pallor, irritability, agitation, crying, vomiting, and seizures (Ciurea et al., 2011). Common symptoms in children who are victims of SBS are irritability, inappetence, sleepiness, seizures, dizziness, fatigue, headaches, and visual complaints, sleep disturbance and apnea (Cronin, 2001; Paiva et al., 2011). Another study supports similar symptoms of SBS with additional symptoms such as alterations in consciousness, vomiting, fluctuating muscle tone, bradycardia, poor feeding, broken cervical bones, rib, neck or skull injuries, and bruises apparent on upper torso (Walls, 2006). Of these symptoms; coma, seizures and apnea are most likely to lead to developmental delays, seizure disorders and static encephalopathy.

As infants grow up and enter childhood and adolescent stages, different physical impairments can become evident. Physical impairments that appear as the child enters the school setting are problems with postural awareness, orientation, visual perception, tactile hypersensitivity, spatial disorientation, handwriting, and atypical behavior (Cronin, 2001). Functional limitations that are affected by problems in vision, speech and hearing are walking, dressing, feeding, bathing and processing skills. Deficits with these everyday occupations and skills impair the child’s ability to be successful at home and in
school. In a study by Wells, Minnes, and Phillips (2009) results showed that out of a sample size of thirty children who had sustained a pediatric brain injury, twenty-two experienced impairments in gross motor functioning and twenty-six experienced impairments in fine motor functioning. Following a TBI, many children experience difficulties with spasticity such as contractures and speech impairments caused by Ataxia (Cronin, 2001). Of this population who experienced motor impairment Klonoff, Clark and Klonoff (as cited in Cronin, 2001) reported between 5% and 30% of the children will show improvements for up to 7 years post-injury as they continue to develop.

Sensory processing skills are another area affected in children who experience TBI as an infant. Galvin, Froude, and Imms (2009) studied the sensory processing abilities of children ages 3-10 with moderate to severe TBI. The study sample of 20 children with mild to moderate TBI was evaluated using the Sensory Profile and their scores were compared to normative data. Data indicated that scores on the Sensory Profile for these children which were outside of the normal sensory ranges include: auditory, visual, vestibular, touch, and multisensory with the exception of oral sensory processing. The occupational therapists who conducted the study reported children with mild to moderate TBI as being most sensitive to noise, being over stimulated by external factors, and that they had more difficulty visually locating items in a busy context. Based on data collected from the questionnaire, the participants also displayed difficulty with vestibular function, high-level balance activities, and they were more sensitive to pain and touch. From an occupational perspective, the children displayed increased difficulty with activities such as dressing when multiple senses were required (Galvin et al., 2009).

Experiencing motor impairments not only affects a child’s ability to effectively
function across contexts but also affects their ability to play with other children, which has a psychosocial impact on them. A physical impairment is external, which makes a child look different from their other peers and this can have a negative impact on their social participation (Wells, Minnes, & Phillips, 2009). In the study by Wells et al., (2009) out of the thirty children who participated in the study, 80% were not participating in age-appropriate social skills across all contexts.

*Cognitive deficits*

Cognitive processing recovery is slower among infant and preschool children with TBI, as they experience more global deficits in verbal and performance skills. Two thirds of infants experience language difficulties and those with SBS have an even worse recovery rate (Ashton, 2010). Reading is more difficult for young children who sustain a TBI prior to learning to read versus older children who already have learned to read. It is easier for children to relearn a skill that has already developed than having to develop the skill after experiencing a TBI. Executive functioning is difficult to assess in infants due to the fact that they have not yet developed the skills of attention, planning, and memory (Anderson et al., 2012; Ashton, 2010). After mild TBI, cognitive symptoms the child will experience include: difficulty with concentration and memory, poor reasoning and judgment, difficulty in school, acting on impulse, slow completion of tasks, and difficulty relaying thoughts into words (Cronin, 2001).

Authors found that within the 12 month to 10-year post injury period, it has been shown that children with severe TBI experience significant gains with verbal skills when compared to children within the 12 month to 30-month follow-up period. They also noted that after a three-year period, the gap between children with severe TBI and their peers
begin to stabilize (Anderson et al., 2012). According to Cronin (2001), the most common cognitive impairments that a child will experience post-injury are acquiring new skills and the ability to process new information. Unfortunately, in the infant population these deficits are difficult to interpret because infants have yet to reach many of the significant developmental milestones and verbal communication. As the child matures and is expected to learn new information these cognitive impairments will become more evident.

Important factors that influence a person's cognitive outcomes are a person's adaptive abilities and family function (Anderson et al., 2012). A large percentage of children who experience TBI will experience cognitive dysfunction within the first year post-injury. Factors that impact cognitive impairment are the severity level of the traumatic brain injury, previous learning disabilities, behavior problems, poor family functioning and limited family resources (Winthrop, 2010).

*Psychosocial deficits*

Infants who sustain TBI are affected psychosocially and the severity of psychosocial impairment is determined by several factors such as family function, supports, age and severity of brain injury (Stancin, Wade, Walz, Yeates, & Taylor, 2008; Winthrop, 2010). The psychosocial deficits, which affect a child with mild TBI, are behavior, depression, anger management, irritability, personality changes, and social difficulty (Cronin, 2001). There is a strong correlation between aggression and those who have experienced a TBI at a younger age. The following factors are associated with causing aggression: depression, concurrent traumatic complaints, younger age at brain injury, low satisfaction with life prior to injury, and demographic and premorbid
conditions. The following four types of aggression have been identified: verbal, physical force towards objects, physical force towards others, and physical force towards self. It was noted that at any given point five years post discharge, 25% of participants with TBI experience aggression (Baguley, Cooper, & Felmingham, 2006). Kaldoja and Kolk (2012) studied, 35 children ranging from three to sixty-five months old with mild TBI to determine trends and correlations of specific characteristics caused by a TBI. The results indicated that children who had difficulty with self-regulation and autonomy, subsequently showed social and emotional deficits. Affective problems were ranked the highest in children that were twelve months old, whereas, self-regulation, autonomy, and communication difficulties were ranked highest among children at 30 months and older (Kaldoja & Kolk, 2012).

A study by Winthrop (2010) compared the cognitive outcomes of children with traumatic brain injury verses children with an orthopedic injury. The study results found children with TBI to have more deficits in neuropsychological, adaptive functioning, behavioral, and academic readiness. Those children with traumatic brain injury verses children with orthopedic injury, non-related to brain dysfunction experienced more difficulty with academics and had slower cognitive recovery (Winthrop, 2010).

Initial Assessments

Within the first three hours of injury, a CT-scan is the main assessment tool. For children, who experience a skull fracture, which is a post-traumatic lesion, surgery is always recommended to prevent further neurological deficits or seizures (Ciurea et al., 2011). The role of an occupational therapist assessing an infant post traumatic brain injury is to focus on three primary areas of function; physical, cognitive and
psychosocial. The very first step is to complete a clinical observation of the infant looking at primitive reflex testing, developmental delays, visual and auditory awareness, and verbal responsiveness (Wells, Minnes, & Phillips, 2009).

Challenges can arise for an occupational therapist when assessing an infant after a TBI due to the varying functional deficits and family dynamics. There is a need to assess the whole child to determine all the deficit areas for intervention planning. The following aspects of developmental motor control after an infant experiences a TBI must be assessed: vision, auditory, oral motor, extremity control, prone position, grasp, sitting, standing, reaching, transitions, range of motion, and interaction with the environment (MacDonald & Helfrich, 2001).

The two scales commonly used to determine the degree of severity of the injury and predict functional outcome is the Glasgow Coma Scale (GCS, Cronin, 2001) and the Standard Test Severity Rating (STSR, Wells, Minnes, & Phillips, 2009). The GCS is used to determine present function of the infant post-injury and assesses three different areas; verbal responses, eye opening and motor response (Wells, Minnes, & Phillips, 2009). The STRS is a standardized assessment similar to the GCS, which assesses severity level of injury within one year after the injury. The STRS is determined by an occupational and physical therapist to assess data of the infant to determine standardized tests scores of the injury (Wells et al., 2009).

Assessing an infant after TBI requires a team approach to assess all areas of the child to predict functional outcome. A study by Wells, Minnes, and Phillips (2009) looked at three efficacy models for determining the severity level of injury post TBI, The Clinical Team Severity Rating (CTSR) the Glasgow Coma Scale (GCS) and the
Standardized Test Scores (STS). Among these three assessments the CTSR scale accounted for more variance in cognitive and social outcomes verses the standardized test, GCS and STS. A multidisciplinary team comprised of a physician, psychologist, a physiotherapist, an occupational therapist and a speech-language pathologist administered the CTSR. Each team member was responsible for rating the severity level of the patient according to his or her own discipline’s perspective. The severity level of the injury was then determined by each discipline’s individual rating of the patient from the perspective of the infants estimated functional level prior to the accident and the changes post accident (Wells, Minnes, & Phillips, 2009).

The Bayley Scales of Infant Development and the Peabody Developmental Motor Scales second edition (PDMS-II) are assessment tools used to measure developmental delays in young children. The Bayley Scales of Infant Development is a norm referenced assessment tool used to measure infant and toddler (1-42 months) development in cognitive, motor, language, and social-emotional and adaptive behaviors. The Language Scale is comprised of two subtests, receptive communication and expressive communication. The Motor Scale is comprised of two subtests a fine motor and gross motor test. The purpose of the assessment is to determine developmental delays (Connolly, McClune, & Gatlin, 2012). The assessment includes a standardized test and a caregiver report and looks at the infants’ physical responses as well as gathering parent information (Badr, Garg, & Kamath, 2006). The Peabody Developmental Motor Scales second edition (PDMS-II) is a standardized diagnostic assessment that is widely used to determine a child’s developmental motor status. The purpose of the assessment is to predict a child’s motor competence, compare fine and gross motor control, provide
quantitative and qualitative measures of the infant/child’s skills, evaluate progress, and to
provide a research tool. The test has six subtests for motor ability; reflexes, locomotion,
stationary, object manipulation, visual-motor integration and grasping (Connolly et al.,
2012).

Connolly, McClune, and Gatlin (2012) researched the concurrent validity of the
Bayley Scales of Infant and Toddler Development, Third Edition (Bayley-III) and the
Peabody Developmental Motor Scales 2nd edition PDMS-II. The outcome of the study
revealed both the Bayley-III and PDMS-II had moderate to very high correlation in
composite scores. The study supports concurrent validity for the use of these assessments
with children aged 29 days to 25 months 20 days who have, or are at risk for,
developmental delays (Connolly et al., 2012).

Two common assessments used to measure gross and fine motor skills in infants
are the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) and Beery
Development Test of Visual Motor Integration (VMI). The BOTMP is an assessment
used to determine gross and fine motor impairment. The Beery Development Test of
Visual Motor Integration (VMI) is used to determine visual motor impairment. In the
study by Wells, Minnes, and Phillips (2009), both assessments indicated high levels of
internal consistency in measuring both fine and gross motor impairment in an infant post
TBI. Assessing a child’s gross and fine motor skills are important to determine how the
infant or toddler will interact in their environment and independently function.

An assessment that can be used to determine a child’s functional performance
level is the Functional Independence Measure for Children (WeeFIM). This assessment is
an 18-item based assessment that measures self-care, mobility, and cognitive abilities
(Kramer et al., 2012). The assessment measures pre-injury status and family characteristics and looks at factors such as upper extremity function, cognitive function, and appearance. It also assesses social interactions and communication, post-traumatic stress disorder (PTSD), family functioning, caregiver burden, patient’s perceptions, and supports (Winthrop, 2010). The WeeFIM has been confirmed for use with children with normal development, developmental disabilities, and acquired brain injury and to measure the level of independence in developing children aged 6 months to 8 years of age (Kramer et al., 2012)

When assessing level of function in an infant post TBI it is important that occupational therapists look at all factors that can influence recovery and that may contribute to the cause or severity of the injury (Connolly, McClune, & Gatlin, 2012; Wells, Minnes, & Phillips, 2009). Home context and family function can greatly influence the outcome of an infant post-injury and even predict possible secondary problems related to the brain injury. The Home Observation for Measurement of the Environment (HOME, 1984) is an assessment designed to measure both quantitative and qualitative stimulation and supports available in a child’s home or environment. The assessment is a good initial and follow-up measure because it has four different versions for progression based on childhood stages. The first version is for birth to three years of age, early childhood (3-6), middle childhood (6-10) and early adolescent (10-15) (Case-Smith & O'Brien, 2010; Stewart, 2010).

Rijlaarsdam et al. (2012) assessed the psychometric and developmental properties of the Infant Toddler Home Observation for Measurement of the Environment (IT-HOME) in an exclusively observational context. The researchers added new items to the
review of current information in the observational assessment according to review of literature and consultation with professionals. The results of the study indicated meaningful links to a child’s growth, health, intelligence and wellness in relation to socio-emotional development and their environment. An infant’s housing conditions are directly related to level of psychological distress and ability to effectively function. Through assessing the home environment and observing the young infants, professionals are able to predict outcomes and use data to design interventions. Overall, the study supported good psychometric properties of the assessment (Rijlaarsdam et al., 2012).

The Ages and Stages Questionnaire (ASQ) is a developmental screening tool with 30 simple worded questions for parents or primary caregivers. It assesses young children from birth to 5 years old and contains questions to be filled out over intervals of 4, 6, 8, 12, 16, 18, 20, 24, 30, 36, and 48 months. ASQ makes for a good initial and follow up assessment for infants who have experienced TBI because it addresses communication, fine motor, gross motor, problem solving, and personal-social development which may be affected post TBI. It looks at the changes that the infant experiences as he or she ages, which are important in determining continued treatment as these children grow and new problems arise. ASQ is noted to have strong test characteristics with psychometric properties of test retest reliability of 94% (Piek, Dawson, Smith, & Gasson, 2008).

The Pediatric Evaluation of Disability Inventory (PEDI) is an evaluation designed to be completed by the parent and professional based on their judgments of the performance and functional capabilities of the child with physical disabilities. Self-care, mobility, and social function in children from birth to 7 years old are observed and assessed. There are 197 skill items in the inventory with a rating scale of 1, child has the
skill, and 0, child has not mastered the task. A Rasch analysis indicates the PEDI stands as a well-developed instrument with good reliability and validity (Stewart, 2010).

Follow-up Assessments

Children are likely to benefit from ongoing assessment and intervention because brain injuries sustained within the first year of life can influence development through childhood development stages (Ashton, 2010). Effective outcome measurement tools are the Glasgow Outcome Scale (GOS) and King’s Outcome Scale for Children Head Injury (KOSCHI). The GOS is used to assess how severely a person’s daily living has been affected by their injury. The KOSCHI is an assessment primarily used for older children and adults to determine their level of independent functioning. It can also be used as a follow up assessment after infant TBI (Ashton, 2010).

The Cognitive and Linguistic Scale (CALS) looks at cognitive and linguistic changes that children face post TBI. It consists of 20 items that assess the following: arousal, responsitivity, emotional regulation, inhibition, attention, response time, orientation, memory, simple and complex receptive and expressive language, initiation, pragmatics, simple and complex problem solving, visual-perceptual ability, self-monitoring, and cognitive safety (Anderson, Godfrey, Rosenfeld, & Catroppa, 2012; Kramer et al., 2012). This assessment addresses performance skills that young children are at-risk for developing delays post-TBI later in life.

Executive functioning should be assessed as the child ages and they begin to develop the skills of attention, planning, and memory (Ashton, 2010). Deficits with executive functioning may not be noted upon initial infant assessment due to the fact that
these skills develop later; therefore, follow-up assessments are crucial to assess cognitive functioning.

The Sensory Processing Measure (SPM) is an evaluation developed in 2007 to assess sensory processing, praxis, and social participation in the home and classroom. Sensory processing is an area that is commonly affected in a child post-TBI and it is important to determine impairment as it impacts a child’s daily function. Cronbach’s alphas were used to measure internal consistency of the SPM, the results in two of the pilot studies indicated the assessment has high reliability and validity. Focus groups, multiple reviews, and case studies were used to determine effectiveness of the SPM and the initial results indicated that the tool is reliable and valid. However, to truly determine the effectiveness of the assessment a larger sample size is needed. (Miller-Kuhaneck, Henry, Glennon, & Mu, 2007).

Outcomes

When examining outcomes related to pediatric TBI it is crucial to look at all aspects of the infant that could impact recovery such as demographic and environmental factors which include ethnicity, gender, parental factors, maternal education, socioeconomic status, and parental stress (Wells, Minnes, & Phillips, 2009). Factors involved with a person’s outcome are injury severity, injury age, and environment. (Anderson, Catroppa, Godfrey, & Rosenfeld, 2012). Those who were older than seven years of age showed improvements with self-care, mobility, and cognition when compared to younger children. According to their study, there were no differences with socioeconomic status, gender, and handedness. However, there is a difference with age at insult correlated with a risk of neurobehavioral impairment recovery in children with TBI
(Anderson et al., 2010). The older a child when they experience a brain injury the less social participation restrictions they experience. This is due to the fact older children have the longevity of time to learn appropriate social behaviors verses an infant or toddler who has yet to learn social and communication skills. Age is a determinant in outcome of social skills and post-TBI injury impairments involving cognitive development and behavior can affect acquisition of social skills. For the children who are older in age when they sustain a TBI the affect on social participation is less because they have had the ability to develop social skills prior to the injury and retain some knowledge of these skills. Whereas, for an infant or toddler who experiences a TBI social skills are more difficult to acquire because they have not been learned (Wells, Minnes, & Phillips, 2009). Greater improvements in child’s function were also noted among those who received more occupational, physical, and speech therapy when compared to those who did not (Chen, Heinemann, Bode, Granger, & Mallinson, 2004).

Impairment level, type of injury and age are predictors of the different outcomes for a child. A study by Hymel, Makroff, Laskey, Conaway, and Blackman (2007) showed a link between poor recovery post pediatric head trauma and low initial Glasgow Coma scores, diffuse cerebral edema, increased depth and duration of impaired consciousness, cerebral hypo-perfusion, brain infarction and increased depth of parenchymal injury. Skills in language, visuo-spatial, memory, attention, executive skills and processing speed were significantly affected with early brain insult. The study confirmed age of insult does have a significant impact on neurobehavioral outcome. Those children younger then 2 years of age to when they experience a TBI exhibited poor results.
Whereas, those children who sustained a TBI after the age of 7 years old exhibited better results in neurobehavioral outcome (Anderson et al., 2010).

The prognosis of a child is dependent on the type of injury, which resulted in a TBI. The two main causes of infant TBI are falls and shaken baby syndrome (SBS) which are directly correlated with infant characteristics: incomplete developmental milestones, small anatomical features, dependency on others, inability to protect self and inability to verbally communicate needs (Walls, 2006). SBS accounts for injury to 1200-1600 children a year under the age of three years old and the outcome measures are serious, long-term or life threatening (Walls, 2006). In a study conducted by Walls (2006) the long-term effects of SBS resulted in mild to severe cognitive and physical impairments, seizures, blindness, dizziness, motor dysfunction, developmental delays, spasticity, cerebral palsy, hearing impairment or loss, quadriplegia, hydrocephaly, and microcephaly. Shaken baby syndrome is a form of child abuse and should be addressed with all new parents to educate and prevent ignorant acts of physical abuse towards this vulnerable population. Ignorance and lack of education among caregivers are two primary factors as to why SBS cases are so high. Parents/caregivers who are responsible for shaken baby syndrome are most commonly male, young when they become parents, have increased psychological or physical stress, have past or current mental illness, have substance abuse issues, have history of domestic violence, and/or present abusive behavior (Adamo et al., 2009; Walls, 2006). Environmental factors that contribute to SBS are low socioeconomic status, unsafe environment, lack of social and family supports, social isolation, lack of community resources, poor prenatal care, reduced or poor relationship between parents, and dysfunctional family dynamics (Walls, 2006). These
same factors are presented as determinants in non-accidental injuries of an infant, which include SBS, inflicted TBI, non-accidental trauma, and abusive head trauma. A non-accidental head injury results in worse outcomes of an infant 0-2 years of age versus an accidental head injury primarily based on the fact that non-accidental injuries are more severe (Adamo et al., 2009).

In injuries caused by falls, the outcome measures are similar depending upon how severe the fall is. In a prospective study (Johnson, Fischer, Chapman, & Wilson, 2005) evaluated 72 children, aged 4 months to 4.5 years old, who sustained accidental head injuries due to a fall to determine the difference in outcome related to type and nature of the head injury. The data indicated that children typically do not experience significant harm in domestic accidents. It indicated that skull fractures are rare and occur only within 5% of cases. The type of surface of the floor was not a factor in the extent of the injury. It was noted in the study that significant cranial damage or skull fractures are more likely to occur from a fall when the height is more than 1-meter. In the study 100% of those who fell from a distance greater then 1.5 meters and 95% of those who fell from over 1 meter displayed visible head injuries (Johnson, Fischer, Chapman, & Wilson, 2005).

In a similar study Ibrahim, Wood, Margulies, and Christian (2012) investigated the age-dependent variables of head trauma within types of falls and injury patterns. Data from the study revealed the number of infants admitted to a hospital due to a low height fall, less than 3 feet, was more common than in toddlers, whereas, toddlers were more likely to be admitted due to a fall from more than 10 feet. This indicates that in both infants and toddlers’ head injuries from falls are dependent upon age and mechanism; both age groups experienced intracranial head injuries with both low and high height falls.
The length of recovery time has a significant impact on functional outcomes. After a three-year period, the gap of cognitive and functional outcomes starts to stabilize with injured and non-injured children. In between 12-months to 10 years post injury, there are gains in functional outcomes, specifically with verbal skills when compared to a shorter time frame of 12 months to 30 months. Evaluating and assessing a child who has experienced a TBI several years after they sustained an injury is important due to the significant functional and cognitive impairments that can become apparent as a child reaches developmental milestones (Anderson, Godfrey, Rosenfield & Catroppa, 2012).

Barlow, Thomsom, Johnson, and Minns' (2005) completed a cross-sectional and prospective longitudinal study, to look at the long-term neurologic and cognitive outcomes of individuals who had experienced a TBI, including SBS. According to the authors there is little research out there on neurologic, behavioral, and cognitive outcomes; therefore, they set out to investigate these outcomes in young children. The sample consisted of 25 children in Scotland who had experienced an inflicted TBI. The outcome measures of the Glasgow Outcome Score and Seshia’s outcome score were used as well as the Bayley Scale of Infant Development to measure the cognitive outcomes. The results indicated that those with inflicted TBI had a poor prognosis and the exact outcome correlated to the severity of the injury. A total of 68% of survivors were considered abnormal during their follow up visit, which was around 59 months after the insult. Thirty-six percent of the children were noted to have severe difficulties and were totally dependent, 16% had moderate difficulties, and 16% had mild difficulties. The neurologic deficits that were identified during follow up consisted of: motor deficits,
visual deficits, epilepsy, speech and language abnormalities, and behavioral problems (Barlow et al., 2005).

Ganesalingam et al. (2011) completed a prospective longitudinal study looking at the effect TBI has on young children’s executive functions and social competence. Participants ranged from 3 to 6 years of age, 23 children diagnosed with severe TBI, 64 diagnosed with moderate TBI, and 119 children diagnosed with orthopedic injuries (OI). The children were assessed at 3 and 6 months post injury. The study data indicated that there were more negative outcomes with executive functions and social competence in children who had experienced a severe TBI than in children with an OI (Ganesalingam et al., 2011).

Hymel et al. (2010) studied the impact of head injury depth on functional outcomes. The study sample consisted of 54 children with varying depths of acute cranial injury at 36 months of age. Six months after the injury, neurodevelopmental evaluations were conducted on the children. The results indicated that children with superficial brain damage of the epidural, subdural, and cortical areas were not as highly linked to abuse and injuries were less severe; whereas, subcortical injuries were highly correlated to abuse and were more severe. The children with subcortical injury were more frequently abused and more frequently demonstrated the following injuries: “inertial injuries, acute respiratory problems, circulatory compromise, acute encephalopathy, prolonged impairments of consciousness, inter-hemispheric subdural hemorrhage, bilateral brain hypoxia, ischemia, and swelling” (Hymel et al., 2010, p. 712). Data from this study shows that head injury depth is a useful tool in determining injury prognosis and in determining useful approaches for intervention methods (Hymel et al., 2010).
The purpose of a study by Kramer et al., (2012) was to determine factors that affect the functional outcomes and skill levels of children who have experienced a severe TBI. The functional outcomes were assessed between the years of 1998 and 2010 at discharge post-injury and three months after discharge from the tertiary care affiliated acute brain injury rehabilitation. The study group consisted of 39 participants ranging from three to eighteen years old who met the inclusion criteria of experiencing a severe TBI and of having the lowest level of functional skills according to the Functional Independence Measure for Children (WeeFIM). The Cognitive and Linguistic Scale (CALS) was used to assess the cognitive and linguistic changes after the children sustain a TBI. Thirteen children were administered the CALS and all of them improved their CALS scores over their stay at the rehabilitation center (Kramer et al., 2012). The shorter the amount of time between the injury and being admitted was correlated to children having higher functional outcomes and a shorter inpatient stay. The results indicated that there is an increased risk for adverse outcomes in younger children, especially children under the age of seven. However, the study shows that even children with the most severe deficits and lowest level of functioning still have potential for large gains. It highlights the importance in early assessment being associated with better functional outcomes and discharge planning (Kramer et al., 2012).

The purpose of Winthrop’s (2010) study was to identify the predictors of outcome of quality of life after a child experiences a TBI in order to utilize the most effective interventions and optimize the recovery of the child. There is a decrease in health-related quality of life (HRQOL) of children after trauma, which contributes to increased caregiver stress and family burden of injury. After an injury, most children experience
quick psychological and physical recovery; however, children who sustain a TBI experience short and long term impairments such as post-traumatic stress disorder (PTSD) which negatively impacts their HRQOL. This article highlighted the importance of addressing the HRQOL of the child into the assessment to create effective family-centered interventions and increased quality of life for high risk and injured children (Winthrop, 2010).

Intervention

Prevention

Preventative treatment is very crucial in reducing the prevalence of shaken baby syndrome and TBI. In 2001 the State of New York implemented a law to educate new parents on the risk factors of SBS and provide education on methods to prevent SBS. Twenty-one percent of the participatory parents reported the education was beneficial and felt other new parents should take part in the education prior to leaving the hospital after giving birth. The prevention education was found to be effective in the New York region reducing SBS by 60% (Walls, 2006). Within the United States there are several organizations which have been established to provide evaluation to help prevent SBS, the organizations include: Prevent Child Abuse of America, Healthy Families of America, National Center for Shaken Baby Syndrome, The American Academy of Pediatrics, and Bright Futures. Each of these organizations have a webpage that can be accessed by the public; the pages provide resources such as educational material for parents and professionals on SBS, pamphlets, videos, posters on safety procedures within the home context, and professional practice guidelines on prevention and education (Walls, 2006).
Schwartz (2012) explored the child safety procedures enacted nationally that strive to prevent infant injuries that may lead to traumatic brain injuries. The National Transportation Safety Board recommends children under the age of two ride in a car seat when on an airplane. The American Academy of Pediatrics and the National Highway Traffic Safety Administration recommends children under the age of two commute in a rear-facing care seat, which provides 25% reduced risk of injury from a car accident verses a front-facing car seat (Schwartz, 2012). The Federal Aviation Administration allows the lap child rule, which allows a parent to have their child on their lap during the flight. This was enacted due to fear of reducing the number of plane tickets purchased because parents will not want to purchase a plane ticket for their child and will omit the trip entirely. However, this does put a child at higher risk injury while traveling and the risks should be addressed with parents to prevent increased injuries. The Consumer Product Safety Commission has prohibited drop-side cribs due to the increased infant injuries related to falls. However, this does not prevent parents from making alterations to the cribs such as raising the mattress level in the crib for ease in placing their child in the crib. Unfortunately, this increases the risk of a child climbing out and falling, which is the most common cause of crib injuries (Schwartz, 2012). Out of all crib-related injuries two-thirds resulted from falls (Yeh, Rochette, McKenzie, & Smith, 2011).

The limitation to these policy proposals are that they are solely safety recommendations and are not mandated as a law, therefore many individuals may not choose to follow these recommendations when making safety decisions for their children. A primary factor that plays a role in poor compliance with the safety proposals is
affordability and cost of going out to purchase these new and safer products (Schwartz, 2012).

Yeh, Rochette, McKenzie, and Smith (2011) researched the incidence and etiology of injuries related to falls from cribs, playpens and bassinets. In the study they found the number of injuries is very high, reaching 181,654 injuries in those two years or younger from 1990-2008. The high incidence rate supports the need for increased parent/caregiver awareness and education related to crib safety for infants two years and younger to reduce crib related injuries. The education should include proper usage of cribs, playpens, and bassinets across context; home visits; and family training to ensure safety in the home (Dunst, Bruder, Trivette, & Hamby, 2006; Yeh, Rochette, McKenzie, & Smith, 2011).

SBS can be prevented and therefore it is important to ensure preventative approaches for the public. Some examples of prevention approaches are increasing the number of public service announcements, requiring completion of CPR and instructional classes for babysitters and parents before caring for an infant, and enforcing early detection and check ups by the primary care physician (MacDonald & Helfrich, 2001).

Stewart et al., (2011) conducted a longitudinal study to determine the effectiveness of the shaken baby syndrome Triple-Dose Strategy prevention program implemented in Ontario, Canada. The objective of the program was to reduce the incidence of shaken baby syndrome. The “triple-dose” approach involves three stages to the prevention program: the first dose includes registered nurses (RN’s) educating parents, caregivers, and family members through a DVD on triggers such as the acronym PURPLE for persistent crying in the first few months of an infant’s life. PURPLE stands
for “peak of crying, unexpected crying patterns, resists soothing, pain-like face, long-lasting, and evening and later afternoon crying” (Stewart et al., 2011, p. 1802). This is used as an educational tool to teach parents about the normative behaviors of persistent crying patterns. The second dose involved the RN’s completing home health visits to go over additional questions, materials and give a DVD and pamphlet to the parents to aid in the educational process of the program. The third dose involved media campaigns to target prevention through advertisements. Results show that the program has been successful in reducing incidence rates of SBS. The RN’s were 94% confident that the program would be effective in helping parents cope with the early stages of infancy and crying in order to prevent SBS. Parents felt the program was beneficial during the educational process in informing them about the risks and the coping strategies to handle the stressful periods with their newborn infants (Stewart et al., 2011).

Dias et al. (2005) studied ways to prevent abusive head trauma. The aim of the study was to determine whether a comprehensive, regional, hospital-based, parent education program that was implemented at the time of an infant’s birth could reduce the rate of abusive head trauma in children less than 36 months of age. The informational program was provided to at least one parent and both parents if possible just prior to the infant’s discharge. The parents were educated on the dangers of shaking an infant violently and were provided with alternative responses to persistent crying. The parents were then asked to sign a commitment statement after the education was complete; this statement affirmed their understanding of the information presented to them. Seven months after the infant’s birth, phone interviews were conducted to assess the parent’s recall of the information.
This new data was then compared to the control group of the six preceding years. It was found that more than 95% of the parents were able to recall information during the 7-month post discharge phone interview. The results indicated that the incidence of abusive head injuries had decreased by 47% over the course of the five and a half-year study period. This indicated the success of a parent targeted hospital coordinated educational program and the need for more nation wide initiatives similar to this in order to decrease the incidence of abusive head trauma in children less than 36 months old (Dias et al., 2005).

*Early Intervention After Injury*

Early intervention services focus on positioning and increasing the infant’s tolerance for various developmental positions. The prone position is encouraged to facilitate weight bearing through the upper and lower extremities as well as neck extension. While working on feeding, the therapist should encourage the parents and/or caregivers to have the infant in a proper sitting position and to have his or her hands in midline to facilitate holding a bottle (MacDonald & Helfrich, 2001). If the infant experiences increased tone as a result of the TBI, resting hand splints are recommended and should be worn throughout the day rotating two hours on and two hours off. This will ensure good hand positioning by decreasing spasticity and maintaining the arches. Neoprene thumb loop splints also can be worn when the resting splints are off to allow for thumb extension and abduction (MacDonald & Helfrich, 2001).

In Blauw-Hospers and Hadders-Algra’s (2005) systematic review, they analyzed the effects of early intervention on motor development of children from birth to 18 months. It was found that the type of intervention must correlate with the infants’ age.
There are noted differences in infants at preterm age versus infants who have reached full term age and their interventions must be specifically tailored for full benefits. Preterm infants benefit from interventions mimicking the intrauterine environment. Full term infants benefit from motor training programs in which interventions focus on stimulating the child’s exploration of active motor behavior. These types of interventions have positive links on the child’s motor development. Approaches that deal with passive handling techniques such as NDT were shown to not have a positive connection to motor development (Blauw-Hospers & Hadders-Algra, 2005). In a systematic review by Brown and Burns (2001), they set out to determine the effectiveness of NDT with at risk, low birth weight and injured infants. NDT is described as treatment that addresses neurological motor dysfunction. The findings in this review were inconclusive and NDT did not show direct positive results with these infants. Due to NDT being challenging to master and the efficacy not clearly defined, it may not be a beneficial approach to the infant TBI population.

In a study by Pick, Dawson, Smith, and Gasson (2008), the researchers set out to distinguish whether a child’s motor performance ability between 4 months to 4 years were predictors in determining cognitive and motor performance as they got older and were about to transition into the school system. The participants consisted of 33 children between the ages of 6 and 11. The Ages and Stages questionnaire was used and the results indicated that there was a predictive relationship between early motor function and cognitive performance, including working memory and processing speed in school-aged children. The results also indicated a connection between socioeconomic statuses predicting fine motor performance (Piek, Dawson, Smith, & Gasson, 2008).
Badr, Garg, and Kamath (2006) conducted a study on a 12-month individualized cognitive/sensorimotor stimulation program to determine the effectiveness of the intervention among 62 infants with brain injury. Included in the intervention was the Curriculum Monitoring System (CAMS) to assess cognitive and sensorimotor stimulation, specifically looking at five programs: cognitive, language, motor, self-help, and social skills. Outcome measures used were the Bayley assessment scales, mother-infant interaction scales and the assessment of the home environment. Two questionnaires were given to the mothers to complete; the social support scale and the perceived stress scale. The study results showed that the intervention had little effect on the scores of the Bayley mental and motor development assessment or on the likelihood of an improved infant-mother interaction. However, there were differences seen in the Nursing Childhood Assessment Feeding Scale (NCAFS) scores within 6 months of the intervention group. The poor outcome statistical measures of the intervention are not considered significant due to mothers reporting satisfaction with the care provided by the nurses and not wanting to discontinue their relationship with them.

*Caregiver Education*

Family education and caregiver training are crucial components of the infant’s recovery process to ensure safety and foster improvements. Training should ideally occur as an ongoing process when the infant is receiving inpatient therapy; however, often the guardian of the infant and even the discharge location is unknown. Unfortunately, there is very little education and training that occurs when infants who have experienced TBI are being discharged to a foster home or foster family (MacDonald & Helfrich, 2001).
When the family is present, the occupational therapist (OT) should begin the education and training process with educating family members on typical development of an infant. The OT should then educate the family on the physical and psychosocial deficits that resulted from brain damage of their infant. Therapeutic use of self is important to validate caregiver’s feelings of possible frustration that arise when caring for an inconsolable infant (MacDonald & Helfrich, 2001).

Current educational material exists on SBS written for a varied array of audiences. A campaign called “Don’t Shake the Baby” was implemented in 1989 and includes brochures translated into different languages and accounts for cultural sensitivities regarding educational material on SBS. This program provides information to new parents post delivery addressing how to cope with crying infants and the dangers of shaking (Walls, 2006). Literature suggests the best way to prevent SBS is through prevention and education towards parents and caregivers of young children (Walls, 2006).

The National Center of SBS (NCSBS) provides information directed specifically to fathers (as they are the most prevalent gender to cause SBS) to bring awareness of their role as a nurturing figure in a child’s life and to combat the stereotypes fathers may have in caring for their children (Walls, 2006). The NCSBS implemented a program called the period of PURPLE crying tool, which is the same PURPLE crying tool that the triple-dose prevention program included in their educational section (Stewart et al., 2011; Walls, 2006). The tool is used to educate parents on infant crying and describes the normal behavioral characteristics of an infant’s stages of crying (Walls, 2006).
was primarily designed to improve parents’ knowledge and change their behaviors when coping with their infant’s persistent crying patterns (Walls, 2006).

Lakes et al. (2009) studied outcomes of the CUIDAR model for early intervention training program that focuses on improving parenting skills to optimize child outcomes. The program is designed to deliver preventative early intervention services to underserved preschoolers at risk for behavioral disorders, and includes two components, service delivery and parent education. The study group included 169 children ages 3 to 5 years old from different ethnicities and socioeconomic statuses. Results of the study indicated the program was successful in recruiting parents and caregivers of low-income families whose young children were at risk for behavioral and emotional disorders. It was also shown to be an effective approach in reducing child management problems and improving parent coping strategies with their child’s behavioral and emotional problems (Lakes, Kettler, Schmidt, Haynes, Feeney-ettler, & Kampter, 2009).

Role of OT

Occupational therapists who have graduated from a program accredited by ACOTE have the knowledge and skills to be involved in prevention and intervention programs with this population of infants and families (ACOTE, 2012). The occupational therapists’ (OT) role in early intervention assessment includes evaluating a child’s atypical behavior, their developmental delays, and level of supports in their lives post TBI (Cronin, 2001). If a child displays increased need for caregiver support, due to being at risk or displaying current physical or cognitive disability, the focus of the early intervention program provided by an occupational therapist is on parenting, caregiver education and training. The end goal of treatment is to create an environment that
increases the infant’s ability to play and interact independently (Cronin, 2001). In the acute stage of treatment, an OT would provide interventions for positioning, range of motion, and sensory stimulation. In outpatient care, intervention shifts to a focus on remediating/compensating motor control, ADL training, and restoring cognitive-perceptual skills (Cronin, 2001).

It is important as an OT or healthcare professional to understand the role of national policy such as Individual Disabilities Education Act (IDEA) when providing services to children. When a child younger then three years of age sustains a TBI they are eligible, as an at risk population to receive early intervention services because they are considered to have a disability (Cronin, 2001). Part C of IDEA provides eligible children birth through two years of age early intervention services (U.S. Department of Education, 2004). Early intervention is primarily focused on family-centered care, which is essential when working with infants who are dependent on their families for care. Within the early intervention process family training, counseling, and home visits are services covered under Part C of IDEA (Dunst, Bruder, Trivette, & Hamby, 2006).

Occupational therapists who work with infants who have experienced SBS can become frustrated because the injury to the child might have been prevented, discharge dates and destinations are often uncertain, and because they may encounter the suspected abuse during family training and education. However, it is important as occupational therapists to set aside these angers and biases in order to provide the appropriate training and education essential for both the infant and abuser (MacDonald & Helfrich, 2001). However, it is also important to understand the role of an OT as a mandated reporter in reporting child abuse or neglect. If an OT or any other health professional suspects a
child is in harms way based upon observation, professional training and experience, they are held legally responsible to report the situation (Child Welfare Information Gateway, 2010).

Summary

The current literature on intervention and treatment for young children who experience TBI is limited, especially in the area of occupational therapy. Based on the current literature that exists in early intervention, nursing, psychology, neuroscience and medical journals the need for improved prevention and caregiver education when working with an infant or young child who experience TBI is evident.

Currently, healthcare professionals have access to interventions and evidence-based research on TBI with school-aged children and adolescence, yet the research on intervention and preventative approaches for the infant and younger child with TBI is limited for healthcare professionals. The prevalence of infant TBI, 0 to 4 years of age, is one of the highest population groups to experience TBI (Faul, Xu, Wald, & Coronado, 2010). The age group between 0-4 years old has contributed to 251,546 emergency department visits, 15,239 hospital visits, and 998 deaths (Faul et al., 2010). The lack of literature for the child population, 0 to 4 years of age, and the high prevalence rate of TBI suggest the need for OT practitioners to have current resources to target intervention for the children who have experienced a traumatic brain injury at a young age.

Young children who experience a TBI are a vulnerable, at risk, population and are dependent on their caregivers for everyday function. Findings from research identify the two primary causes of TBI in young children are due to falls and SBS. These causes are directly related to external factors in a young child’s environment that can be addressed
by an occupational therapist to create an environment that increases the infant's ability to play and interact independently (Cronin, 2001).

Based upon recent literature findings reviewed in this chapter and effective programs that exist for prevention and caregiver education, the need has been established for a prevention and educational manual designed for occupation therapists to use as part of an intervention program when working with children who have experienced a traumatic brain injury at a young age. The caregiver manual is made up of two sections; the first section focuses on primary prevention and education for parents and caregivers about vulnerable, at-risk infants and toddlers. The first section includes resources on safety around the home and community and education on trigger points and coping strategies to prevent abuse and neglect. The second section focuses on secondary prevention and education for parents and caregivers of the injured, at-risk infants and toddlers. This section includes teaching the caregiver approaches and techniques that will help care for their injured child and prevent secondary injury from occurring.

The methodology used to develop the manual is described in Chapter III of this document. The caregiver manual can be found in its entirety in Chapter IV. Chapter V contains a summary on recommendations.
CHAPTER III
METHODOLOGY

A comprehensive literature review was completed for the development of the product of this scholarly project; *A Manual for Caregivers of Infants and Young Children Who Are At-risk For or Who Have Experienced a TBI: Prevention and Education*. The literature review was conducted using Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, Academic Search Premier and Google Scholar databases accessed through the Harley E. French Library of the Health Sciences at the University of North Dakota School of Medicine and Health Sciences. Research data was also located from National websites such as Brain Injury Association of America and Centers of Disease Control and Prevention (CDC).

The author’s met with the director of Safe Kids, Carma Hanson, to discuss current preventative measures being used within the Grand Forks, ND region. Safe Kids is a nationally recognized organization with the mission of providing safety awareness and education for parents and caregivers within varying communities. The purpose of the meeting was to obtain information on current community prevention and education methods for caregivers with infants and young children. Carma Hanson stated the importance of and need for prevention and education for parents and caregivers, especially with the younger childhood population, as they are dependent on parents and
caregivers for safety and survival (C. Hanson, personal communication, October, 3, 2012). The authors obtained useful information that can be integrated throughout the product as resources and educational material for parents and caregivers. Permission to use the materials was also obtained verbally and through a permission form (See Appendix).

The caregiver manual is made up of two sections; the first section focuses on prevention and education for parents and caregivers about vulnerable, at-risk infants and young children. The first section includes resources on safety around the home and community and education on trigger points and coping strategies to prevent abuse and neglect. The second section focuses on prevention and education for parents and caregivers of the injured, at-risk infants and young children. This section includes teaching the caregiver approaches and techniques that will help care for their injured child and prevent secondary injury from occurring.

The occupation-based model, Person-Environment-Occupation (PEO), was used as a guide in developing the caregiver manual. PEO addresses the interaction of the person, environment, and occupation and how each area affects the person’s ability to engage in occupation. The caregiver, home context, and the caregiver’s ability to care for the child are the three areas the occupational therapists address equally within the caregiver manual. The caregiver manual is designed for occupational therapists to use as a tool as part of a prevention program when working with parents and caregivers of infants and young children and as part of the intervention program for a young child who has experienced a TBI to help his/her parents and caregivers care for him/her through prevention, education, and training. The focus of the occupational therapist is to facilitate
maximizing the fit of the caregiver, home context and the caregiver’s ability to care for the child in order to increase positive occupational performance in the parenting role (Strong & Gruhl, 2010).

Principles of adult learning models were taken into consideration when developing the manual for parents and caregivers in order to address the variety and level of learning styles in the adult population. An adult learns best when learning is voluntary, related to an immediate need, problem or deficit and is self-directed. Interactive worksheets and written educational materials were included in the manual to facilitate collaboration between the client and therapist and to ensure client-centered practice. The therapist’s role is the facilitator and the caregiver or parent’s role is the agent in learning (Bastable & Dart, 2011).

The manual is included in its entirety in Chapter IV of this document and Chapter V includes a summary of the product and proposes recommendations for possible future research and implementation.
CHAPTER IV

PRODUCT

The product of our scholarly project is a caregiver manual for occupational therapists to utilize for those who are at risk for or have children with traumatic brain injury (TBI). There are two sections to the caregiver manual: the first focusing on prevention for the families of at-risk infants and young children; and the second section focusing on prevention for families with a child who has obtained a TBI to reduce further injury. There is also a CD at the end of the manual for the therapists to be able to reproduce the materials they need for their clients. In addition, the therapists’ contact information will be located on each document as appropriate. "A Manual for Caregivers of Infants and Young Children Who Are At-risk For or Who Have Experienced a TBI: Prevention and Education" was created to provide occupational therapists educational and preventative resources when working with a parent or caregiver of a young child.

The product was designed for occupational therapists when working with caregivers of an infant or young child who experienced a TBI. The manual consists of two sections in addressing prevention and education for the caregivers of infants and young children who are at risk or have experienced a TBI. The first section of the caregiver manual focuses on prevention for the at-risk infants and toddlers. It addresses prevention that is associated with safety around the home such as crib safety, high chair safety, falls prevention, furniture arrangement, window safety, and protection from sharp
objects. Prevention in public areas is also addressed in the following locations: playground safety, stroller and shopping cart safety in grocery stores, car seat safety, wheeled sport safety, and helmet safety. Prevention of abuse and neglect is also targeted in this section through educating the caregivers on typical child development, normative crying behaviors in new infants, and providing resources of healthy coping skills for the caregiver during this new and stressful time. Literature reviewed in Chapter II indicates that these types of preventative materials have been found effective in educating and informing parents and caregivers of risk factors and coping strategies to prepare for stressful times during early parenting and caring for their child.

The second section of the caregiver manual focuses on preventing secondary injury through providing caregiver approaches and techniques that will help them treat their injured child. Techniques that will be taught include: positioning and handling techniques, home modifications, coping skills, and educating the caregiver in their role with their child’s feeding and eating, play, toileting, and sleeping to facilitate healthy development for their child. Informal assessments of the caregiver and home environment will be conducted. In consideration of the adult learning principles, the therapist will give the caregivers interactive worksheets to fill out about their child and their deficits. The therapist will give and review relevant handouts to the caregiver and have them take them home with them to be able to use as a reference and use as needed with their child. Community resources will be provided for the caregivers such as support groups, parent skills training, and coping skill strategies. The purpose of the prevention methods is to prevent further complications and to prevent a second incident of brain injury. Research reviewed in Chapter II indicates an infant or young child who has sustained an inflicted...
TBI is at high risk of being harmed or killed in an unsafe, dysfunctional home environment. The caregiver education manual includes educational material on normal infant development and expectations as compared to infants with TBI. This gives them the knowledge base needed to facilitate healthy development for their young child who has experienced a TBI.

The purpose of this caregiver manual is to reduce the prevalence of TBI in infant’s and young children and educate parents on safety techniques. Preventative techniques are a cost-effective way to provide treatment and avoid injury. The authors of this scholarly project intend to implement this program and caregiver manual to various regions in the United States to prevent TBI and reduce the national prevalence rate.

Chapter IV was an overview of the product of our scholarly project. Chapter V is a summary of the product and proposes recommendations for possible future research, implementation, and progression.
A Manual for Caregivers of Infants and Young Children Who Are At-risk For or Who Have Experienced a TBI: Prevention and Education

BY: Meghan Enabnit, MOTS and Stephanie Gubbels, MOTS
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Section I: Prevention and Educational Material for Caregivers of Infants and Young Children Who Are At-Risk for TBI
Safety Around the Home
Crib Safety
Crib Safety Questionnaire

Crib safety is important due to the risk of fall related injuries as a result of unsafe cribs

1. Is your child’s crib placed near a window, where they are at risk of falling out
   YES       NO

2. Is your child’s crib certified by Juvenile Products Manufacturing Association (JPMA), which verifies the product has been tested for safety and quality?
   YES       NO

3. Is the height of the mattress in your child’s crib?
   YES       NO

4. Are the crib slats on your child’s crib no more than 2 3/8 inch apart (two fingers) to prevent strangulation and/or falling through the slats of the crib?
   YES       NO

5. Is your crib no more than 10 years old?
   YES       NO

6. Does your crib have any loose or missing parts? (May cause side rail to come loose and fall off)
   YES       NO

7. Does your crib have drop sides? If so this may be a risk of falling out of crib due to instability
   YES       NO

8. Have you adjusted the mattress height of your child’s crib once they have started to stand up or pull themselves up? (If mattress height is too high the child is at risk of falling and/or climbing out)
   YES       NO

For more information contact:
IS MY CHILD SAFE IN THEIR CRIB?

Many parents leave their children unattended in a crib because it is thought to be a safe place for them. Unfortunately, cribs are not as safe as we think and account for about 181,654 emergency department related injuries in children 0 to 2 years of age (Yeh, Rochette, McKenzie, & Smith, 2011).
What to look for in your crib:
Safety standards and recommendations to reduce fall related injuries

Placement of crib:
- Do not place crib close to a window and/or arms width of wall art or draperies due to hazards of a fall, strangulation or objects falling on their head.

Crib Standards:
- Crib slats should be spaced 2 3/8" apart, less space than a pop can width
- No drop down sides due to risk of falling out of crib
- No corner posts over 1/16” above end panels for risk of strangling
- Check for Juvenile Products Manufacturing Association certification this verifies the product has been tested for safety and quality
- Adjust/lower height of the mattress once child begins to sit/stand up to decrease fall risks

For more information go to US Consumer Product Safety Commission website: www.cpsc.gov

For more information contact:
Home Safety
Home Safety Checklist

Home safety is important in preventing injury and falls in the home setting where young children live.

With the questions below please circle yes or no in relation to your home:

1. Do you have gaits at the top and/or bottom of your stairs?   YES  NO
2. Do you have window guards on your windows or a device that does not allow the window to open more than 4 inches wide?   YES  NO
3. Is your furniture placed away from windows?   YES  NO
4. Are the hallways, stairways or main living areas free of clutter in your home?   YES  NO
5. Do you keep your children younger than 6 years of age away from bunk beds in your home?   YES  NO
6. Does your child have a baby walker without wheels?   YES  NO
7. Do you have protective guards on the corners of your walls?   YES  NO
8. Are the spaces in between your stairway and balcony rails less than 3 1/2 inches wide?   YES  NO
9. Does your child’s high chair have proper straps to secure them into their chair?   YES  NO
10. Are Bookcases, filing cabinets, and tall furniture secured to the walls?   YES  NO

If you responded NO to any of the above questions, those are the areas in which you should focus on in your home to ensure a safer environment for your younger children and to prevent risk of falls.

Information was obtained from www.safekids.org
How Safe Is My Home For My Child?

Facts
- Falls in the home contribute to a young child sustaining a traumatic brain injury.
- From 2002-2006 there were 161,455 fall related injuries in children 0-4 years of age in the U.S. (Faul, Xu, Wald, & Coronado, 2010).
- Your child is twice as likely to experience a fall at home versus at daycare due to furniture arrangement, stairs, and baby walkers.
- In 2009, 56% of fall-related deaths were among ages 4 and under.
- Annually 7,300 children are hospitalized due to baby walker injuries.
- The three main causes of falls in the home are from beds, high chairs, and high furniture.

Child proofing your home is very important in preventing children from severely injuring themselves and sustaining non-accidental head injuries.

SAFETY AROUND THE HOME

STAIRS
- Ensure stairways are well lit to prevent tripping while holding infant.
- Install baby gates at the bottom and top of stairs to prevent your baby from crawling up or falling down the stairs.
- Stairways should have handrails.
- No clutter in stairways due to tripping hazard.
- When child is old enough to climb up and down stairs (18 months and older) ALWAYS supervise and hold their hand.
HOME SAFETY
Solutions to Prevent TBI

CONTINUED SAFETY IN THE HOME

FURNITURE ARRANGEMENT
1. Install a gate at the top and bottom of your stairs.
2. Position your child in their highchair correctly with secure straps around chest and in between legs.
3. Supervise child when around furniture and stairs.
4. Eliminate clutter by putting items in storage boxes and off the floor.

For more information contact:
Information obtained from www.safekids.org

WINDOW SAFETY
1. Avoid placing furniture near windows.
2. Install window guards to prevent children from falling out of windows.
3. Or install a device that prevents the window from opening more than 4 inches wide.
4. Keep windows locked.

HIGHCHAIRS
1. Always use safety straps around chest and legs.
2. Do not let child stand in high chair.

BABY WALKERS
1. Buy stationary walkers.
2. Make sure it follows all safety standards; look for ASTM or JPMA label, to ensure the device meets safety standards.
Identify Which Scenario is Safer and Why?
Identify Which Scenario Is Safer and Why?
Identity: Which Scenario is Safer and Why?
Safety in the Community
Playground Safety
Did you know?

- 200,000 children experience an injury that leads to an emergency room visit each year.
- Falls are the cause of 80% of playground injuries.
- 40% of all playground injuries are related to lack of adult supervision.
- The average victims age of playground injury deaths are six year olds.
- Wood chips and rubber mats allow for the best access to playgrounds for children in wheel chairs.

Remember: Playground injuries can be prevented with adult supervision and setting playground rules for your child. It's worth it!

Is your child safe on the playground?

Ways to prevent injury:

**Adult Supervision**
- Monitor and supervise your child on playground equipment to prevent serious injury.
- Young children are often unaware of danger and cannot foresee potentially dangerous situations.
- Older children like to test the limits and require close supervision.
- Scope out parks before you choose to go there to ensure that there are benches or a close place to watch and supervise your child.

**Ensure Proper Ground Surfacing and Age Appropriate Playground Equipment**
- Avoid playgrounds with the following hard surfaces: asphalt, blacktop, and concrete.
- Recommended surfaces are wood chips, sand, shredded rubber, mulch, and pea gravel.
- Avoid areas with tree stumps, tree roots, and rocks, which can cause a child to fall.
- Check for sharp edges and points on equipment to prevent injury.
- Check for railings on equipment to prevent falls.
- Young children should not play on playground equipment intended for older children. The following equipment should be avoided by children under the age of 5: log rolls, overhead rings, tall spiral slides, parallel bars, swinging gates, sliding poles, and cable walks.

**Set Rules for your Child**
- Educate your child on proper playground behavior such as no pushing or shoving.
- Avoid playground equipment that is wet and slippery because it can lead to falls.
- Teach your child to use equipment properly: go feet first on slides, no standing on swings, and avoid climbing outside of the rails.
- When jumping down from equipment, teach your child to bend their knees and land on both feet.
- Have one person go down a slide at a time.
- Before climbing down equipment, look down to make sure it is clear and no one is climbing up.
- Children who are pre-school age should only climb up to five feet and children who are school age should only climb up to seven feet.
Identify the safe and unsafe pictures:
Identify the safe and unsafe pictures:
The following equipment is unsafe for children under the age of five:
1. How often do you take your child to the park/playground?

2. How closely do you supervise your child?

3. What kind of equipment does your child play on?

4. What is the layout and surface of the playground?

5. Are there sharp edges and railings on the playground equipment?

6. Does your child play with other children?

7. What kind of clothes does your child wear when playing?
Stroller and Shopping Cart Safety
Stroller and Shopping Cart Safety

STROLLER SAFETY TIPS

• Never leave your child unattended in the stroller.
• Always use the safety belt to ensure security and proper positioning of your child. The safest strap is a T strap, which goes in between the legs and across the waist.
• Ensure the leg openings are the correct size to prevent your young child from slipping out.
• Prevent the stroller from collapsing by locking the frame mechanism.
• Ensure safety by using the parking break when you're stopped.
• Avoid hanging heavy bags on the handles of the stroller because it may cause the stroller to tip.
• Don't put more children or baggage in the stroller than it is intended for.
• Be aware of the weight limits and do not put a child in a stroller if they are heavier than the manufacturer's weight limit.
• Infants should be in strollers that allow them to lie flat on their back due to their lack of muscle strength and control.
• Children under the age of one should not be transported in jogging strollers due to the lack of head control and mature muscle tone.
SHOPPING CART SAFETY

Facts:
• Two thirds of all shopping cart head injuries are related to falls.
• Children are unattended in shopping carts by 80% of parents.
• The highest incidence for shopping cart injuries is among 1 and 2 years old.

REMEMBER TO:
• Always use seat belts.
• Never leave your child alone.
• Do not let your child ride in the large part of the shopping cart.
• Do not place a car seat in a shopping cart basket.
• Do not let your older child push your young child in the shopping cart.

For more information contact:

Information obtained from www.safekids.org and www.kidshealth.org
Community Resources
Babysitter Safety Handbook

What should a babysitter know when caring for a young child?

Purple Crying

PURPLE is an acronym used to describe to parents the characteristics of this developmental period of crying.

- **P**=persistent crying
- **U**=unexpectedly
- **R**=resists soothing
- **P**=pain-like face
- **L**=long lasting
- **E**=occurs late afternoon and evening hours

- Expect for the crying to start at around 2 weeks, worsen, then get better around 3-5 months. This type of crying is normal so do not be alarmed. Communicate with the parents on what the child's crying pattern was like when they were away but be familiar with what is normal.

Strategies to prevent fall

- Supervise child at ALL times.
- Use gaits at the bottom and top of stairs to prevent child from falling down the stairs or climbing the stairs unattended.

Home Safety

- Avoid clutter in the home.
- DO NOT let children play on furniture unsupervised.
✓ ALWAYS strap child in properly in high chair -straps across waist and chest.

See picture:

✓ DO NOT have children younger than 6 years of age on a bunk bed.

Playground Safety

✓ ALWAYS supervise child when playing at a playground, with young children you should stay with them the whole time, holding there hand when necessary and preventing them from climbing too high or getting into dangerous situation.

✓ Stay away from playgrounds with sharp playground equipment and avoid playgrounds if the equipment is wet or slippery after a rainfall.

With any questions please call:

___________________ at __________________ 

For emergencies call 9-1-1
Resources

Community Home Health:
1. _________________________________________
2. _________________________________________
3. _________________________________________
4. _________________________________________
5. _________________________________________
6. _________________________________________
7. _________________________________________
8. _________________________________________
9. _________________________________________
10. ________________________________________

Distributors for equipment:
1. _________________________________________
2. _________________________________________
3. _________________________________________
4. _________________________________________
5. _________________________________________
6. _________________________________________
7. _________________________________________
8. _________________________________________
9. _________________________________________
10. ________________________________________

Educational Websites:
1. _________________________________________
2. _________________________________________
3. _________________________________________
4. _________________________________________
5. _________________________________________
6. _________________________________________
7. _________________________________________
8. _________________________________________
9. _________________________________________
10. ________________________________________
Resource List

- National Center for Shaken Baby Syndrome www.dontshake.org
- Period of purple crying: A new way to understand your baby’s crying at www.purplecrying.info
- Prevent Child Abuse of America at http://www.preventchildabuse.org/index.shtml
- Healthy Families of America at http://www.healthyfamiliesamerica.org/
- Bright Futures at http://www.brightfutures.org/
- Safe Kids Worldwide at www.safekids.org
- Never Shake a Baby at www.nevershakeababy.org
- Center for Disease Control www.cdc.gov
- www.Kidshealth.org
- Zero to Three: National Center for Infants, Toddlers, and Families
  http://www.zerotothree.org
Motor Vehicle and Bicycle Safety
Helmet Safety
Wearing a helmet is a simple way to prevent serious head injury!

35% of annual traumatic brain injury (TBI) is caused by falls.

Why wear a helmet? Wearing a helmet can reduce your child's likelihood of a serious head injury by 85%.

The good news:
- Helmet use has increased from 15% to 45% since 1988 among children.

Information was obtained from www.safekids.org

Photo courtesy of Safe Kids Worldwide

Helmet Safety

A Guide in Choosing and Using the Right Helmet For Your Child
How to get your child to wear a helmet:

FACT: Younger children and female children are more likely to wear a helmet than male and older children.
- Give them options and let them choose one they like.
- Set an example by wearing a helmet yourself. They will be more likely to follow your lead!
- Start the habit early.
- Reward your child when they wear it.
- Be consistent and establish the basic rule: "No helmet. No riding."

How to properly fit your child's helmet:

FACT: More than 1/3 of children who wear helmets do not properly wear it, having either loose straps or a tilted helmet.
- How it should fit near the mouth:
  - When your child opens his or her mouth really wide, the helmet should hug his or her head.
- How it should fit near the ears:
  - The helmet should feel snug yet comfortable and make a "V" shape under your child's ears.
- How it should fit near the eyes:
  - Your child should be able to see the bottom rim of his or her helmet when looking up.

Q & A

How many states have laws about wearing helmets?
As of 2012, there are twenty-one states and the District of Columbia have enacted some form of mandatory helmet wearing laws.

When do the majority of falls among children occur when on wheeled sports?
Accidents and falls can fall anytime anywhere.

How long does a helmet last before it needs to be replaced?
Helmets should be replaced every six years, when they no longer fit, if there are any broken parts, or after a crash. After a crash, a helmet loses its shock absorption ability needed to prevent injury and must be replaced.

Should I let my child pick out his or her own helmet?
Yes, if your child thinks it is cool and they like it, they are more likely to wear it.

For more information contact:
Helmet Safety Questionnaire

1. Does your child wear his or her helmet?

2. How do you get your child to wear his or her helmet?

3. How do you know if your child’s helmet properly fits him or her?

4. How should your child’s helmet fit around the eyes, ears, and mouth?

For more information contact:
Wheeled Sport Safety
HOW OFTEN DO CHILDREN RIDE BIKES?
It is estimated that more than 70% (27.7 million) children between the ages of 5 and 14 ride bicycles. Each month, 3 out of 4 children ride their bike.

HOW MANY CHILDREN GET INJURED OR DIE A YEAR DUE TO WHEELED SPORTS ACCIDENTS?
On average 630 children are injured daily due to cycling crashes.

Each year, over 200,000 children 14 and under are injured from bike crashes and over 60,000 children are injured from crashes while riding scooters, skateboards, and skates.

The leading cause of death and permanent disability in children after a wheeled sport incident is head injury.

In 2008, there were 84 reported deaths from wheeled sport incidents. Of those, 80% involved motor vehicles.

WHAT CAUSES THESE INJURIES?
The leading cause of bicycle injury is due to the high number of children riding bikes and not wearing helmets.

Only 45% of children are reported to always wear their helmet while riding their bike.

WHAT ARE WAYS TO PREVENT FALLS AND INJURIES?
- The single most effective way to reduce serious brain injury is to wear a helmet. They have shown to reduce the risk of a brain injury by nearly 90%. (Safekids, 2012)

- Set an example for your child and obey all road signals and always wear your helmet.
- Scan the environment and be aware of your surroundings. Look both ways at intersections.
- Have your child stay on sidewalks and paths and avoid on road cycling until the age of ten.
- Have your child avoid riding their bike in low vision conditions such as fog, nighttime, and bad weather.
- Make sure your child wears bright clothes and that their bike has reflectors.
- Ride with both hands on the handlebars.
- Ride in the same direction as traffic, on the right side of the street.
- Avoid the following areas to prevent falls:
  - Wet leaves
  - Big puddles
  - Changes in ground surfaces
  - Gravel or rocks
  - Curbs
  - Other people in the way

For more information contact:
Information obtained from www.safekids.org and www.kidshealth.org
1. How old is your child?

2. Does your child ride any of the following: a bike, skateboard, non-motorized scooter, or skates?

3. How often does your child ride his or her bike, skateboard, scooter, or skates?

4. Does your child always wear a helmet?

5. Does your child ride alone or with others?

6. Do you supervise your child when he or she is riding?

7. When and where does your child ride?

8. How far does your child usually ride?
Car Seat Safety
FACTS:
• The risk of death is reduced by 71% for infants and 54% for toddlers when car seats are properly used.
• Children who use belt-positioning booster seats with secured belts reduce their risk of injury by 59% when compared to children who wear standard seat belts.
• According to the National Highway Transportation Safety Administration (NHTSA) in 2009, motor vehicle crashes were the leading cause of death for children ages 3 – 14 (Safe Kids, 2011).

Recommendations:
• The National Transportation Safety Board recommends that children under the age of two ride in a car seat rather than parents' lap when on an airplane.
• The American Academy of Pediatrics and the National Highway Traffic Safety Administration recommends children under the age of two travel in a rear-facing car seat, which provides 25% reduced risk of injury from a car accident versus a front-facing car crash (Schwartz, 2012).

Information was obtained from www.safekids.org

Don't Risk It! Buckle Up All the Time!!

Car Seat Safety
Is your child safe in while riding in your car?

Photo courtesy of Safe Kids World Wide
Rear Facing Car Seats:
When your child is under the age of one and/or less than 20 pounds, use a rear-facing car seat in the back seat of your car. Use a rear facing convertible seat up until your child reaches the age of two or the upper limits of the seat. Don’t recline your child’s rear facing car seat any more than 45 degrees to ensure the child’s head is resting on the seat and to keep his or her airway’s open.

Forward Facing Car Seats:
Switch to a forward facing car seat when your child reaches the age of two and/or outgrows the height/weight limit of the rear facing car seat. His or her head should be within one inch of the top of the car seat. Forward facing car seats are now commonly sold with higher harnesses suited for older, heavier children. The longer you can keep your child in a harness the safer they will be.

Booster Seats:
Switch to a booster seat when your child outgrows the height and weight limits of the forward facing car seat. The characteristics that identify a child outgrowing the car seat include: ears above the car seat, or his or her shoulders above the top harness openings.

For more information contact:
Car Seat Safety Questionnaire:

1. How old is your child?

2. What is the weight and height of your child?

3. What type of car seat does your child currently have?

4. Does your child's current car seat meet their needs and requirements?

5. What are some resources you can use to check if your child is safe in their car seat?

6. Where are some places in your community you can go get a car seat for your child?

For more information contact:
Abuse and Neglect Prevention
Purple Protocol
My baby cries all the time, what am I doing wrong?

- Many infants will go through crying periods in the first 4 to 5 months.
- The infant is not crying because of poor parenting or illness.
- This period is part of normal behavioral development and they will eventually grow out of it. This stage the child is going through is often called PURPLE crying.

- A term you may have heard of is "colic" which can sound negative to some parents. Colic is simply a period in an infant’s life, 3-5 months, where they persistently cry.

- PURPLE is an acronym used to describe to parents the characteristics of this developmental period of crying:
  
  P = persistent crying
  U = unexpectedly
  R = resists soothing
  P = pain-like face
  L = long lasting
  E = late afternoon and evening hours

- A parent can expect for the crying to start at around 2 weeks, worsen, then get better around 3-5 months.
- This type of persistent crying is normal for infants and caregivers should not be concerned. However, it is important to consult with your child’s physician as crying can be a significant warning sign of being sick.

This information was obtained from www.Purplecrying.info

For more information contact:
Purple Crying

Purple crying acronym was developed by the National Center for Shaken Baby syndrome as a way to educate parents and caregivers on infants’ normative crying patterns in order to reduce the incidence rate of shaken baby syndrome. Many times parents will become frustrated with their children that present colic and there frustrations lead to shaking their baby in a way that causes developmental damage.

What is purple crying?

Purple crying represents the normative crying patterns in an infant. Often infants, from the time they are born to around 3 to 5 months will engage in persistent crying pattern. The persistent crying is not caused by anything in particular and does not indicate your child is sick. Often parents will generalize their infants crying pattern with bad parenting, fortunately it is nothing the caregiver or parent if doing. The important thing is to understand the characteristics of the purple crying and know that it is only a stage the infant is going through and will not last forever.

Purple crying stands for persistent crying patterns, occurring unexpectedly, infant resists soothing, presents with pain-like face, and long lasting and occurs in the late afternoon and evening hours.

How can I cope with my child who will not stop crying?

The first reaction from a parent and/or caregiver to a crying infant is to ask whether the infant is tired, hungry, hurt, or need to be changed. In the cases of a child with characteristics of purple crying they will continue to cry and cry and will not stop. This can be very frustrating and tiring for the parents and caregivers. The best thing for you to do is to stay calm. By staying calm you are able to control your frustration and not act your frustrations out on how you treat your infant. Staying calm reassures the baby that there is nothing wrong and can translate to calming the infant down.

What can I do to soothe my baby?

When your baby is crying there are a number of things you can try to soothe them. These things are not guaranteed to work but are good to try because often they will help your
baby to stop crying. Soothing strategies include: “feed baby, burp your baby, give baby a lukewarm bath, massage your baby, make eye contact with your baby and smile, kiss your baby, talk softly or sign to them, run a vacuum cleaner to provide a calming humming noise, or take your baby for a car ride” (National Center for Shaken Baby Syndrome, 2011). Each of these options may full-fill a need or desire your baby is seeking and provide sensory input that your baby finds calming.

What can I do to control my anger and frustration with my infant’s crying?

The best thing you can do when you feel you are losing control and no longer can control your frustration is place your infant in a safe place and walk away from your infant to blow off some steam. There are number of things a parent or caregiver can do to relax and calm themselves down. Some examples are:

- Take a warm bath and read a book
- Listen to calming music
- Watch a television program
- Pop in an exercise video and exercise in the home
- Engage in a craft or hobby you find enjoyable
- Take a short nap, 20-30 minutes. Ask a friend, neighbor or family member to come over to your home so you can leave for a short time to nap.
- Alternate shifts with your spouse taking care of your child to allow for each of you to engage in a relaxation time or to leave the home to get some fresh air, peace and quiet
- Keep a journal
- Talk to someone
- Organize and clean around your home
- Remember to laugh and engage in activities you find enjoyable
- Seek professional help if needed such as a psychologist, physician, family counselor, etc.

To receive additional information and to read stories on parent’s experiences go to: www.purplecrying.info

You may also contact:
What’d you learn?

Fill in the acronym

P-
U-
R-
P-
P-
L-
E-

Do you feel you understand your infants crying pattern better?

Identify three ways you can cope with your infants persistent crying?

1. 

2. 

3. 
Shaken Baby Syndrome
Don’t SHAKE a Baby!!!

Have you tried everything and your baby STILL won’t stop crying?

You aren’t a bad parent and your child is ok...it’s part of normal infant development for an infant to persistently cry up to 4 months in age.

So DON’T worry...THIS WILL GET BETTER!!

What should I do when I’m feeling stressed, tired and/or frustrated with caring for my infant?

- Call a friend, relative or neighbor to come and help
- Call a parent helpline for support
- Place your baby in their crib on his/her back to ensure they are safe and walk away for about 5 to 10 minutes to cool down
- If anger and frustration do not precede then talk to a family counselor or healthcare professional about anger management
- Number one is focus on calming yourself down so you can be a good parent to your infant

When your baby is crying non-stop what can I do to comfort him or her:

- Check for any signs of illness such as dirty diaper, diaper rash, teething, fever, or discomfort in positioning
- Check whether he/she needs to be burped or is hungry
- Gently rock or cuddle, sign or talk with a soft soothing voice
- Take a walk with him/her or go for a car ride (in car seat)
- If child presents positive to signs of illness call your physician for further follow up

If your baby is still crying after trying these soothing techniques don’t worry it does not mean you’re a bad parent

INFORMATION OBTAINED FROM
Preventing Shaken Baby Syndrome: Guide for Health Departments and Community-Based Organizations Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. See www.cdc.gov/injury
SHAKENBABY SYNDROME

Shaken baby syndrome is a form of abusive head trauma and traumatic brain injury as a result of violently shaking an infant or your child.

SIGNS AND SYMPTOMS OF SBS

- Overly tired, abnormal weakness throughout the body
- Rigid or stiff posturing
- Very irritable
- Abnormal bruises on arms or chest
- Decreased expression in the face
- Demonstrate difficulty swallowing or suckling
- Hard time breathing
- Seizures
- Forehead appears larger or swollen
- Difficulty lifting head
- Tracking and scanning with eyes appears difficult

FACTS TO KNOW AS A PARENT/CAREGIVER

- Shaken baby syndrome usually occurs when parents and/or caregivers are overly tired and frustrated with their baby that will not stop crying
- SBS can result in death! And accounts for 1,000 infant deaths/year
- SBS is fully preventable by parents and/or caregivers

Information obtained by The National Center on Shaken Baby Syndrome at www.dontshake.org
WHAT HAPPENS TO AN INFANT WHEN SBS OCCURS?

• The brain rotates within the skull causing damage to the brain tissue
• When brain tissue is injured or torn bleeding can occur within the brain
• Often infant will have retinal bleeding which is bleeding behind the eyes

WHAT ARE THE LONG-TERM RESULTS OF SBS?

• Learning disabilities
• Physical disabilities
• Visual impairment or blindness
• Speech impairment
• Hearing impairment
• Cerebral palsy
• Behavioral problems
• Cognitive impairment
• Seizures

HOW CAN PARENTS/CAREGIVERS PREVENT SBS:

• Communicate the importance in NEVER, EVER shaking a baby to caretakers
• Have people you can call when you feel frustrated and overwhelmed
• Inform family, friends and babysitters of the dangers of SBS

For more information contact:

Information obtained by The National Center on Shaken Baby Syndrome at www.dontshake.org
Coping Skills
WHAT DO I DO TO HELP REDUCE STRESS, FRUSTRATION, AND ANGER WHEN CARING FOR MY INFANT OR YOUNG CHILD?

Please circle the correct answer to the following:

**Gender:** Female or Male

**Age:** 18-24; 25-30; 31-35; 36-40 Other________

List the top three stress relieving strategies you use on a weekly basis:

1. __________________________________________

2. __________________________________________

3. __________________________________________

Identify 2 or 3 people you feel comfortable contacting for support or help:

1. __________________________________________

2. __________________________________________

3. __________________________________________

Answer Yes or NO

Are you a single parent? YES NO
Do you work a full-time job? YES NO
Do you use illegal substances? YES NO
    If yes, how often: _________
Do you drink alcohol? YES NO
    If yes, how often: _________
Is this your first child? YES NO
    If no, please list how many children you have with ages___________

Was your child born premature or have any disabilities? YES NO
Do you have a baby that won't stop crying? How do you cope with the sleepless nights?

4 Healthy coping strategies to reduce stress and frustration

• **Progressive Relaxation**
  Tighten and relax the muscles in your body starting with your feet, then legs, hands, arms and lastly chest. Remember to breathe as you do the stress coping strategy and complete on a daily basis, as this exercise will help to reduce stress.

• **Deep Breathing**
  Deep breathing is an effective way to reduce stress in any setting. First find a quiet place to sit or lay down. Once comfortable, inhale through your nose for a count of 3-5, filling your rib cage with air. Next, exhale through your mouth for a count of 3-5, completely emptying your air from your lungs. Repeat this process for 10-15 minutes.

• **Visual Imagery**
  Find a quiet place to sit or lay down. Then take a few deep breaths in and out to calm your mind and body. Once you feel your mind and body relaxing, close your eyes and start to imagine a calm and relaxing setting you find peaceful. Stay in this place for at least 10 to 15 minutes while continuing to deep breathe.

• **Walking away from stressful situation**
  When you sense your body is tense and you no longer have control of your emotions walk away from the stressful situation. When you are caring for your infant make sure you place them in their crib on his or her back and then go to a separate room to engage in visual imagery, deep breathing or progressive relaxation for 10 to 15 minutes. Then check on your infant to make sure they are ok. Walking away is the number one way to prevent taking out your frustration and anger out on your baby, especially when you are overly tired.

Other relaxation strategies include: listening to music, reading, calling a friend, family member, or neighbor, doing yoga, taking a nap, giving yourself time to relax.

**If the above strategies are not helpful consider contacting a healthcare professional for help.**
Section II:
Prevention and Educational Material for Caregivers of a Child Who Has Experienced a TBI
Developmental
Infant Development Birth to 3 years old


To obtain more information on infant development, there are free brochures and parent guides on the website by Zero to Three: National Center for Infants, Toddlers and Families. This is a credible resource for an occupational therapist to use in practice when working with parents and/or caregivers.
Birth to 3 Months

Your Baby's Development

The first 3 months are all about babies learning to feel comfortable, safe, and secure in the world. By responding to their signals and providing lots of love and comfort, you help them form a trusting bond with you.

**How are you helping your baby learn to feel safe and secure?**

<table>
<thead>
<tr>
<th>What Your Baby Can Do</th>
<th>What You Can Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am getting to know you and the other people who love and care for me.</td>
<td>Talk and sing to your baby. This makes him feel loved and helps him bond with you. Hold your baby. Enjoy some skin-to-skin cuddle time with your little one.</td>
</tr>
<tr>
<td>• I recognize your faces, voices, and smells.</td>
<td></td>
</tr>
<tr>
<td>• I respond to your smile and touch with pleasure.</td>
<td></td>
</tr>
<tr>
<td>I am learning how to “tell” you what I need.</td>
<td>Watch your baby to learn her signals. Does she have a “hunger” cry? Does she rub her eyes or look away from you when she is tired? Smiles are easy to figure out. Respond to your baby's signals. When her eyes are bright and she is awake and alert, it is time to play. Slow things down when she cries, turns away, or arches her back.</td>
</tr>
<tr>
<td>• I can use my sounds, facial expressions, and body movements to tell you how I’m feeling— sleepy, hungry, happy, or uncomfortable.</td>
<td></td>
</tr>
<tr>
<td>• I can show you when I want to play and when I need a break.</td>
<td></td>
</tr>
<tr>
<td>I am beginning to use my body to make things happen.</td>
<td>Give your baby something to reach for and hold onto—a finger or toy. Let him touch objects with different textures and shapes. Hold a toy within your child's reach so he can swat it with his hands or feet. Watch to see how your baby is “discovering” his body. Does he look at his hands, suck on his feet, or try to roll?</td>
</tr>
<tr>
<td>• I can grip your finger or a toy you put in my hand.</td>
<td></td>
</tr>
<tr>
<td>• When I am hungry, I might move my head toward my mother's breast or the bottle.</td>
<td></td>
</tr>
<tr>
<td>We are becoming closer and closer every day.</td>
<td>Comfort your baby whenever she cries. You can't spoil a baby. Soothing makes her feel safe, secure, and loved. Help your baby calm herself by guiding her fingers to her mouth, giving her a pacifier, or offering her a blanket or soft object that is special to her.</td>
</tr>
<tr>
<td>• I am learning to trust that you will read and respond to my signals.</td>
<td></td>
</tr>
<tr>
<td>• I rely on you to comfort me. This helps me learn to comfort myself.</td>
<td></td>
</tr>
</tbody>
</table>

As you use this resource, remember that your child may develop skills faster or slower than indicated here and still be growing just fine. Talk with your child's health care provider or other trusted professional if you have questions. Your family's cultural beliefs and values are also important factors that shape your child's development.

For more information on parenting and child development, go to: [www.zerotothree.org](http://www.zerotothree.org).
What's on Your Mind

I have to go back to work. Will my 8-week-old be okay in child care?

Yes, as long as it is a high-quality program. Look for a clean and safe setting with no more than three babies for every caregiver. There should be toys and books at the baby's level and child care providers who will let your baby sleep, eat, and play according to her own schedule. Make sure that the caregivers talk and play with the babies, that they comfort them when they are upset, and that they are loving and nurturing.

Did You Know...

Babies whose mothers reported high stress cried and fussed more than babies whose mothers reported little stress.

What It Means for You:

Even very young babies pick up on how their loved ones are feeling. When you are calm and relaxed, your baby is more likely to feel calm. When you are feeling stressed out and overwhelmed, your baby is more likely to feel tense. So in order to take good care of your baby, it's really important that you take good care of yourself. Ask trusted friends and family members for help when you need a break. Make time to do things that make you feel good. And be sure to talk to a trusted health care provider if you are feeling down or depressed.

Spotlight on Crying

- Crying, as hard as it is to hear, is a normal way babies communicate hunger, discomfort, distress, or a need for your attention.
- Most newborns reach a crying peak at about 6 weeks. Then their crying starts to decrease. By 3 months they typically cry for about an hour a day.
- Being with a crying baby who is hard to soothe can be exhausting, stressful, and frustrating. But keep in mind that just by being there—holding and comforting your baby—you are teaching him that he is not alone and that you will stick by him through thick and thin.
- While all babies cry, some babies cry much more than others. This is known as colic and it's defined as crying that:
  - begins and ends for no obvious reason
  - lasts at least 3 hours a day
  - happens at least 3 days a week
  - continues for 3 weeks to 3 months

What You Can Do

Talk with your health care provider. Crying may have a medical cause—a food sensitivity, heartburn, or other physical condition.

Try holding your baby more. Some babies cry less when they are held more.

Wrap your baby snugly in a blanket—called “swaddling”—and rock her gently.

Use soothing sounds. Talk or sing softly to your baby. Try running a fan or humidifier in your baby's room. Sometimes babies are soothe by this background noise.

Reduce stimulation—lights, sights, sounds, and textures—for your baby. Sometimes less stimulation leads to less crying for babies with colic.

Reach out for support. Extended families and friends may be able to step in to give you a needed break. Everyone needs support, and nobody needs it more than the parents of a crying baby.

Stay calm. When you're calm, it helps your baby calm down. If you find yourself feeling frustrated, put your baby on his back in a safe place—like the crib—and take a short break. Crying won't hurt your baby, and taking a break will let you soothe another very important person...you!

Don't give up. Soothing your baby is a trial-and-error process. If one strategy doesn't work, try another. Hang in there, and remember that the crying will get better.

What are some things you can do to soothe yourself after a tough day?
Developmental Delays Questionnaire

Date ___________________________
Child’s name ___________________________
Child’s age ___________________________

Have you noticed any changes in child’s behavior? Describe in detail:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

When did your child experience the head injury?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Describe your child’s function prior to the head injury:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Parent/Caregiver Supervision:
1. Who cares for your child during the day?

Babysitter Private nanny Private Daycare Public Daycare lady

Parent and/or Caregiver

2. If daycare and/or nanny care for child during the day, how often during the week:

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

3. How does your child react to being left alone?
________________________________________________________________________
________________________________________________________________________

Identify the delays you observe in your child by circling:

**Physical developmental delays:**
- decreased motor control
- rapid loss of consciousness
- irritability
- agitation
- abnormal crying
- vomiting
- seizures
- sleepiness
- dizziness
- fatigue
- headaches
- visual
- complaints
- sleep disturbance
- apnea
- fluctuating
- muscle tone
- bradycardia
- poor feeding
Cognitive developmental delays:
difficulty with concentration and memory
difficulty in school
slow completion of tasks
acquiring new skills
verbal communication difficulties

poor reasoning and judgment
acting on impulse
difficulty putting thoughts into words
ability to process new information

Psychosocial Developmental Delays:
sadness
social difficulty verbal aggression
physical force towards others
irritability

anger management
physical force towards objects
physical force towards self
Environmental
Home Safety Assessment

Full Name: __________________________ Date: __________

Address: ___________________________ Phone Number: ___________________________

Highest Level of Education Completed:
Less than High School____ Some High School____ High School_____ Some College ____ College Degree____ Postgraduate Degree____

Ethnicity (Optional):
Caucasian____ African American____ Native American____
Asian American____ Hispanic____ Other____

Type of residence:
Apartment____ Single family home____ Other____

Number of bedrooms in home?

_______

Number of people living in home?

_______
# Home Set Up:

<table>
<thead>
<tr>
<th>Entrance:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the floor clutter free?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are there non-slip rugs?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Do bookshelves have heavier items on the bottom?</td>
<td>Y N N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hallways/Stairs:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there safety gaits installed at the top and bottom of stairs?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are the safety gaits installed to the walls?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are stairways and hallways clutter free?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is there good lighting in the hallways and stairs?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are the rugs slip free?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are there handrails alongside the stairs?</td>
<td>Y N N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adult Bedroom:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there clutter on the ground?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is the child supervised when on your bed?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Do bookshelves have heavier items on the bottom?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is there an accessible smoke alarm?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are windows easy to open?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Do windows have window guards?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are electrical cords in good condition and out of the way?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are electrical outlets in good condition and covered when not being used</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are space heaters located at least three feet from curtains and outside of children’s reach?</td>
<td>Y N N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child Bedroom:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there an accessible smoke alarm?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Are windows easy to open?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Do windows have window guards?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is the floor uncluttered from toys and other objects in order to prevent falls?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Does the child have a baby walker?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is the child’s crib more than ten years old?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Does the child have any missing or loose parts in their crib?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is the crib or bed placed away from a window to reduce risk of falling out?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Is the height of the mattress and/or bed appropriate for the child’s size?</td>
<td>Y N N/A</td>
</tr>
<tr>
<td>Question</td>
<td>Y</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Do bookshelves have heavier items on the bottom?</td>
<td></td>
</tr>
<tr>
<td>Are electrical outlets in good condition and covered when not being used?</td>
<td></td>
</tr>
<tr>
<td>Are space heaters located at least three feet from curtains and outside of children's reach?</td>
<td></td>
</tr>
<tr>
<td>Are heavy items and houseplants kept out of children's reach?</td>
<td></td>
</tr>
<tr>
<td><strong>Bathroom:</strong></td>
<td></td>
</tr>
<tr>
<td>Is there a non-slip rug in the bathroom?</td>
<td></td>
</tr>
<tr>
<td>Are electrical cords out of reach of children and not in sink or near water?</td>
<td></td>
</tr>
<tr>
<td>Are electrical outlets in good condition and covered when not being used.</td>
<td></td>
</tr>
<tr>
<td>Are window guards installed on windows?</td>
<td></td>
</tr>
<tr>
<td><strong>Kitchen:</strong></td>
<td></td>
</tr>
<tr>
<td>Is there an accessible smoke alarm?</td>
<td></td>
</tr>
<tr>
<td>Are windows easy to open?</td>
<td></td>
</tr>
<tr>
<td>Do windows have window guards?</td>
<td></td>
</tr>
<tr>
<td>Are electrical cords in good condition and out of the way?</td>
<td></td>
</tr>
<tr>
<td>Are electrical outlets in good condition and covered when not being used?</td>
<td></td>
</tr>
<tr>
<td>Are space heaters located at least three feet from curtains and outside of children's reach?</td>
<td></td>
</tr>
<tr>
<td>Are children kept out of the kitchen while cooking?</td>
<td></td>
</tr>
<tr>
<td>Are kitchen appliances stored in a safe place and out of reach of children?</td>
<td></td>
</tr>
<tr>
<td><strong>Family Room:</strong></td>
<td></td>
</tr>
<tr>
<td>Is there an accessible smoke alarm?</td>
<td></td>
</tr>
<tr>
<td>Are windows easy to open?</td>
<td></td>
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<tr>
<td>Do windows have window guards?</td>
<td></td>
</tr>
<tr>
<td>Are electrical cords in good condition and out of the way?</td>
<td></td>
</tr>
<tr>
<td>Are electrical outlets in good condition and covered when not being used?</td>
<td></td>
</tr>
<tr>
<td>Are space heaters located at least three feet from curtains and outside of children's reach?</td>
<td></td>
</tr>
<tr>
<td>Is there a barrier around the fireplace?</td>
<td></td>
</tr>
<tr>
<td>Are filing cabinets, bookcases, and all heavy furniture secured to the wall?</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Y</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Are houseplants kept out of children’s reach?</td>
<td></td>
</tr>
<tr>
<td>Is the floor clutter free?</td>
<td></td>
</tr>
<tr>
<td>Do bookshelves have heavier items on the bottom?</td>
<td></td>
</tr>
</tbody>
</table>

**Living Room:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there an accessible smoke alarm?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are windows easy to open?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do windows have window guards?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Is the floor clutter free?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do bookshelves have heavier items on the bottom?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are filing cabinets, bookcases, and all heavy furniture secured to the wall?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Basement:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there an accessible smoke alarm?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are windows easy to open?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do windows have window guards?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the floor free from clutter?</td>
<td></td>
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**Additional Information:**

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**Additional Referrals Needed:**

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**Recommendations:**

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Your Role as a Caregiver

The following pages are summaries from information, which can be found, on Kids Health and to obtain more information go to www.kidshealth.org
Your Role as a Caregiver with your Child’s Feeding and Eating:

- The American Academy of Pediatrics (AAP) recommends that infants be breast-fed versus bottle-fed due to having the antibodies, vitamins and minerals needed for a baby to grow healthy. It is recommended that for the first six months of their life that they solely are breast-fed.
- Breastfeeding is not only meeting the physical needs of the infant but it is also meeting the emotional needs of the infant as he or she is developing through skin-to-skin contact.
- For parents who choose to feed their child formula milk, keep in mind that they digest it slower and will require more feedings throughout the day.
- Your newborn should be fed eight to twelve times a day.
- If your child is fussy and crying, they may not be getting enough to eat.
- How do I know when my baby is hungry?
  - When your child moves his or her head from side to side
  - When your child is opening his or her mouth
  - When your child sticks out his or her tongue
  - When your child places his or her hand in their mouth
  - When your child displays the rooting reflex and begins to turn his or her head in the direction of something touching his or her cheek.
- As your child ages, they will begin to need more food during feeding sessions and will be able to go longer distances between feeding sessions.
- Avoid water, juice, and solid food for the first six months of your infant’s life because breast milk and formula fulfill all of their nutritional needs. You can begin to turn to solid foods along with breast milk or formula when your child reaches six months old.

Information obtained from

http://kidshealth.org/parent/growth/feeding/breast_bottle_feeding.html#cat20511

For more information contact:
Your Role as a Caregiver with your Child's Sleeping:

- Your one to two year old should be getting around 10 to 13 hours of sleep each night.
- Every child is different and form different sleep patterns. Feel free to allow your child to take naps if they like to.
- If napping begins to interfere with their ability to sleep at night, you may want to have your child have quiet time during the day rather than take a nap.
- Make sure your child is sleeping in a secure and safe crib up until the age of two.
- Clear toys and objects from your child’s crib to prevent choking and other injury.
- Make sure your child’s crib is at the correct height and placed in a safe location. It should not be near the following:
  - Window blinds, curtains, pictures, high furniture, and heavy items.
- Consider room set up to allow your child the best night sleep. For instance, have blinds block the morning sun.
- Make sure your child’s room is not causing sleep disturbances for your child. For example, consider possible noise disturbances of nearby TV, radio, and conversation sounds that may keep your child up. Also make sure they have enough coverings such as clothes and/or blankets during colder months.
- Find a nighttime routine for your child that helps with the sleep process. Consider a nighttime bath, backrub, or nighttime story to relax your child.
- Set rules and stick to them. As your child grows, it is important to instill proper a sleeping routine and habits with them so they can grow and get enough rest to grow healthily.

Information obtained from http://kidshealth.org/parent/growth/sleep/sleep13m.html#

For more information contact:
Your Role as a Caregiver with your Child's Playing:

• Your child is learning through play so it is important to create a healthy and fun environment for your child to explore and learn new ideas and skills.

• As an infant, your child's play activities will consist of banging and shaking items as well as interacting with you by making simple faces and gestures.

• As your infant ages, he or she will begin to gain more hand and finger control and their play activities will begin to change due to developing imaginary and functional play.
  - Examples of functional play are: building blocks, pushing a toy car, and talking on a toy phone.
  - Examples of imaginary play are: having tea parties and pretending to eat, using a banana as a phone, and playing house.

• It is important to have your child play with age appropriate toys that facilitate developmental skills such as hand eye coordination and manual dexterity.

• Find out what motivates your child and offer them toys they enjoy to create a sense of satisfaction and allow them to participate in more challenging activities.

• Play dates are a good way to introduce socialization to your child. Your child will be able to take turns, share items, teach, learn from others, and learn proper manners.

• Games and reading are great play activities that facilitate learning and prepare your child for entering school.

Information obtained from http://kidshealth.org/parent/growth/learning/toddler_play.html

For more information contact:
Your Role as a Caregiver with your Child’s Toileting:

- You should begin to potty train your child around 18 to 24 months. Typically girls learn at a younger age and quicker than boys.
- How can you tell if your child is ready to be potty trained:
  - Your child can follow directions
  - Your child tells you they need to go to the bathroom
  - Your child can keep his or her diaper dry for up to two hours
  - Your child can pull down his or her diaper
  - Your child shows an interest in wearing underwear
- It normally takes around three to six months to potty train a child.
- It is recommended to buy training seat or training potty for every seat in your house to encourage your child to use the toilet all the time.
- Establish a routine with your child to sit on the toilet for a few minutes at the same time each day.
- Don’t force your child to stay on the toilet if he or she wants to get up.
- Be patient with your child. Each child learns at different speeds and it is best to set a positive environment for them to learn in.
- Talk to your doctor if your child is not potty trained by the age of three.

Information obtain
http://kidshealth.org/parent/emotions/behavior/toilet_teaching.html#ca

For more information contact:
Behavioral
When you have a crying baby:

- Walk out of the room and count to ten slowly.
- Put your baby down in their crib.
- Call someone to watch your baby and give you a break.
- Go for a walk or exercise.
- Write in a journal.
- Listen to calming music.
- Take a warm bath.
- Scream into a pillow.
- Try some of these solutions to stop your baby from crying: 1) give your baby a pacifier 2) play soothing music 3) hold your child close to your chest 4) burp your child, feed your child, wrap your child in a blanket 5) rock your baby, place your baby in a swing, and/or take your baby for a walk or drive.
- Use positive language with your child such as: I love you, great job, and you are doing well.
- Next time you are angry and don’t know what to do, call this phone number to prevent you from hurting your child: 866-243-BABY.

When you don’t have a strong support system:

- Join and attend local support groups in your community.
- Schedule an appointment with a psychologist or doctor if you feel you are at harm to yourself or others.
- Find a church or spiritual group that provides you with spiritual guidance.
- Do something for yourself that makes you happy. For example: try meditation and/or yoga.

When you don’t have money:

- Realize that you are not alone. There are millions of Americans who are in poverty.
- Come up with a plan to provide for your family: get a job, find resources in your community such as food shelters, garage sales, and other programs.

CAREGIVER WORKSHEET ON ABILITIES AND FRUSTRATIONS:

1. When do you feel most stressed and/or frustrated?

2. What is the first thing you do when you are stressed?

3. What are common trigger points for you?

4. How can you anticipate your trigger points?

5. What coping strategies do you currently have? Are they working for you? Explain.

6. Do you have any concerns about the role of care giving? If so, what are they?

For more information contact:
RESOURCES FOR COPING SKILLS AND SUPPORT GROUPS

- www.safebaby.org
- www.parents.com
- http://www.childrensdisabilities.info/parenting/groups-childrensdisabilities.html
- http://www.metro-parent.com/pse_special_needs_support/
- http://www.snscc-uv.org/
- http://www.themorganproject.org/?gclid=CPWak7nWyrMCFcsWgod_SsA4g
- http://www.jtwf.org/
References

Bayport, MN: Anderson Corporation.


http://safebaby.org/cope.asp


www.safekids.org/assets/docs/for-educators/Bike-and-Wheels-Safety.pdf


CHAPTER V

SUMMARY

The purpose of this scholarly project is to increase awareness and knowledge of infant and young child traumatic brain injury across all contexts, reduce incidence of traumatic brain injury and re-injury and to promote development for the vulnerable, at-risk, infant and young child population through the creation and implementation of a caregiver manual.

The most significant findings resulting from the literature and research reviewed for Chapter II of this document are the following: certain parental factors make an infant or young child more likely to be a victim of abuse or neglect, and there are specific child related factors that are related to experiencing abuse and TBI, infants and young children who have experienced TBI are at higher risk for second incident injury, and education and prevention programs reduce the incidence of brain injury in infants and young children.

The product of this scholarly project consists of two sections of a caregiver education manual designed for occupation therapists to use as a tool to promote TBI prevention. It is intended to be used as part of an intervention program when working with caregivers and their children who have experienced a traumatic brain injury at a young age. The manual also contains preventative techniques which are a cost effective way to provide treatment and avoid injury; and educational information, which was developed for caregivers and parents. The caregiver manual is made up of two sections; the first section focuses on prevention and education for parents and caregivers with vulnerable, at-risk infants and young children and the second section focuses on
prevention and education for parents and caregivers with injured, at-risk infants and young children. There is also a CD at the end of the manual for the therapists to be able to reproduce the materials they need for their clients. In addition, the therapists’ contact information can be added to each document as appropriate.

Many of the tools within the manual can be used interchangeably with new parents and with caregivers who have children who are either identified as at-risk or have experienced a TBI. The tools are designed to address the caregiver, the home context and the caregiver’s ability to care for the child. The role of the OT using this manual as part of prevention and intervention is to achieve a balance between the caregiver, home environment and caregiver’s ability to care for the child across the lifespan.

The use of this product can be implemented by asking pediatric therapists from various regions in the United States to pilot the use of the manual and to help keep data to assess the effectiveness of the manual in prevention of infants and young children experiencing an initial or secondary TBI. It is recommended that the product be implemented in settings such as outpatient pediatric clinics, inpatient NICU, inpatient pediatric rehabilitation settings, early intervention sites and daycare centers targeting caregivers of infants and young children at-risk for abuse.

A limitation of this project is the lack of current evidence-based occupational therapy intervention research on the topic of infant and young child TBI and in addition to the research articles that were used information was gathered from non-research based literature and secondary sources as part of the manual development. Another limitation to this product is that it has not yet been tested in practice.
It is recommended that additional research be completed in the area of infant and young child TBI to provide occupational therapists with evidence-based literature to guide their treatment. It is also recommended that in addition to the preventative and educational approaches now included in the manual that more specific intervention methods be added to the second section to better address deficits and impairment that these infants and young children exhibit after experiencing a TBI.

Therapists should not rely solely on the resources in the manual, but use them to direct client-centered and individualized care. Occupational therapists are trained to use their skills to educate caregivers on strategies to keep their infants and young children safe and healthy. A longitudinal study by Stewart et al. (2011) discussed the effectiveness of a program nurses at a New York hospital developed called a Triple-Dose Strategy prevention program. The program was designed to prevent shaken baby syndrome by educating caregivers on the risks and strategies to reduce injury. As healthcare trends are evolving and prevention, and health and wellness are becoming prevalent areas of practice, it is crucial that occupational therapists take a stronger advocacy role in developing and implementing such programs. Currently, research indicates the lack of research on occupational therapy involvement with the 0 to 4 year old populations who are at-risk or have experienced a traumatic brain injury. These types of findings support the development of and research on types of programs such as the caregiver education and prevention manual that is the product of this scholarly project.
APPENDIX
Permission Release Form:

In signing this form, I, Rachel Horton, hereby give permission for Stephanie Gubbels, MOTS and Meghan Enabnit, MOTS to use the photographs taken and/or on the companies website for the use of their scholarly project to work to earn their masters degree in occupational therapy. The photos will be used in the finished product in *A Manual for caregivers of young children who have experienced a TBI: Prevention and Education*. The photos will be used in the following materials: brochures, flyers, educational handouts, worksheets and newsletters.

If I have any questions or concerns I can contact the students graduate school advisor: gail.bass@med.und.edu or can call the department at (701) 777-2209 and ask for Gail Bass

Rachel Horton  
(Signature)  
11/14/12  
(Date)

Rachel Horton  
(Print name)  
11/14/12  
(Date)
Permission Release Form:

In signing this form, I, [signature], hereby give permission for Stephanie Gubbels, MOTS and Meghan Enabnit, MOTS to use the photographs taken and/or on the company's website for the use of their scholarly project to work to earn their masters degree in occupational therapy. The photos will be used in the finished product in A Manual for caregivers of young children who have experienced a TBI: Prevention and Education. The photos will be used in the following materials: brochures, flyers, educational handouts, worksheets and newsletters.

If I have any questions or concerns I can contact the students graduate school advisor: gail.bass@med.und.edu or can call the department at (701) 777-2209 and ask for Gail Bass.

[Signature] [Date]

(Date)
Hi Carma,
Attached is the picture document with YES or NO next to each picture. Some are stock images or from Bell and we cannot share. Some were from our own photo shoots and we can share.

Thanks,
Jane

Jane Enright
Creative Services Manager
Safe Kids Worldwide
202-699-4469 / www.safekids.org

From: CARMA HANSON <chanson@altru.org>
Date: Fri, 2 Nov 2012 11:48:21 -0500
To: <jengachowitzki@safekids.org>, Jane Enright <jenright@safekids.org>
Cc: <gubbs118@gmail.com>, <meghan.enabnit@my.und.edu>
Subject: Fwd: permission to use photos from SafeKids website
SteadyHealth.com

SteadyHealth Report - Reply To Contact

You have contacted us on our site, and our moderator has replied to you.

Billy said:

Hello.

You have permission to use the image. Just place us as a source (http://www.steadyhealth.com)

Kind regards.

More Promotions!

- Share your experiences on the SteadyHealth discussion boards

Earn Your BSN

Turn your Bachelor into a Master in 12 Months

Marian University

Earn Your BSN

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Business Cards are
www.Vistaprint.com
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