

# Lesson Plans for Home Visits and/or Group Meetings

## Brain Development

To show a visual of the brain and how it works refer to the DVD Traumatic Brain Injuries in Early Childhood: Recognizing, Recovering, Supporting, Chapter 1 titled, “Typical Development and Basic Brain Anatomy” (13:29). Give the parents/caregivers/guardians the “**What Happens When a Baby Bumps Their Head**” **handout-Parent Handout 1**.

One of the best descriptions of brain development in early childhood can be found in a book written by Dr. Jill Stamm, Ph.D, “Bright from the Start: The Simple, Science-Backed Way to Nurture Your Child’s Developing Mind from Birth to Age 3.”

**“The brain develops from back to front, from inside out and from bottom up at the same time.**

**From Back to Front:** The parts of the brain that are responsible for vision wire up early and are located in the back part of the brain (known as the occipital lobe). The visual system of a 6-to-8 month old is pretty much like that of an adult.

Coming forward in the brain, the hearing system wires up quickly as well. The areas above ones ears (the temporal lobes) are important early in life but have a wider window of opportunity for development than the visual areas, staying quite changeable and receptive to learning the sounds of new language for the first few years of life.

Next, moving forward into the motor and speech areas of the brain is an area of language production. We know that children are capable of hearing and understanding language and word meanings far earlier than they can speak or express their thoughts. As children grow in the first year of life and gain practice in making sounds and babbling, the connections in the motor areas become more established and babies gain better control over the muscles in their mouth and tongue.

Finally, all the way forward in the brain, behind ones forehead, this region is responsible for skills such as planning, abstract reasoning, and are called the frontal lobes, which are not fully developed until high school and beyond. This provides some insight into why toddlers do not understand why they should not touch a hot stove, school age children have trouble with logic, and even high school teens, which parents expect to “know better,” do not always make good decisions. Their brains are not fully developed yet to prioritize or to necessarily understand the consequences of their actions.

**From Inside Out:** Central structures of the brain (part of the limbic system) that process and regulate our emotions develop before the outer part (the cortex). These central structures, which “tag” incoming information with an emotional importance, are mostly formed in the first few years of life. The degree to which they form in a healthy way will influence the strength and quality of connections to the outer cortex, which controls the processing of incoming information for thinking and planning, for sensory processing, and for memory storage-basically the kind of brain work that is used in school learning. In other words, how the brain is wired to process.

Emotions in the earliest years directly set the stage for how the child functions later in a formal academic setting.

**From the Bottom Up:** The parts of the brain responsible for the basic functions, such as heartbeat, breathing, and temperature control develop early and are located in the brain stem regions. By contrast, the abilities to maintain focus of your attention, control your emotions and coordinate fine motor movements develop later as the outer cortex wires up.”

TBI can be a chronic condition. Children who experience brain injuries have a tendency to have lifelong issues. These issues may be misdiagnosed or go unnoticed once the injury is no longer seen. Young children may experience prolonged issues and are at greater risk for injury due to the disproportionate size of their head to their bodies combined with low cerebral blood flow. In addition, in the 2-5 population the brain is still in the process of myelination. A TBI can disrupt the myelination process.

Many attentional skills and executive functions undergo rapid development during preschool period. Young children's neuropath ways have not fully matured. Anderson's research found that TBI in young children often results in generalized intellectual delays. In her study children demonstrated persistent neuropsychological deficits in nature. The domain of attention and executive functions is most often affected.

### **Causes of Traumatic Brain Injury/ Home Safety**

Discuss the content found in Parent Handout 2 : "Some Causes of Traumatic Brain Injuries (TBI)" and Parent Handout 4: "Parent Factsheet: Traumatic Brain/Head Injury (TBI) in Children. Research conducted by the Centers for Disease Control (CDC) found that babies ages 2 to 4 months are likely to sustain brain injury from being shaken. This type of injury is also called Shaken Baby Syndrome or Abusive Head Trauma. When an infant is shaken the brain rocks back and forth. The motion causes the axons to tear in addition to the brain hitting the bony structure of the skull. Children are at greater risk for falls/rolling off beds/striking their head on objects or being struck by objects. Not wearing a seatbelt or riding in an improper car seat is another cause for TBI. Asking parents about their observations of their child's motor skills and discussing potential areas in which their child may be exposed to brain injuries hopefully will increase awareness of the causes and will reduce the potential for brain injuries. Help the parent explore their home environment for situations that might cause their child to hit their head. Help them identify ways to reduce the risk of their child having a blow to their head. Traumatic Brain Injury Definition, Prevalence & Mechanisms 21:52 minutes at: <https://www.youtube.com/watch?v=9nRogoPGhps&feature=youtu.be>

### **Signs and Symptoms of Traumatic Brain Injury**

Give the parents/caregivers/guardians the two handouts, Parent Handout 3: "Signs and Symptoms of Traumatic Brain Injuries (TBI)" and Parent Handout 4: "Parent Fact Sheet". It is important to remember that signs and symptoms may not manifest immediately after an incident that can cause a TBI. However, it is important to keep track of when and how the child is injured and should signs and symptoms appear, discuss the injury with a medical provider. During the session a Video clip can be used to link to Recovery Process - Child Factors and Environmental Factors 36:36 minutes at: <https://www.youtube.com/watch?v=eR8jwmCnnQI&feature=youtu.be>

### **What happens if Your Child sustains a Brain Injury?**

Use the video link titled, "Recovery Process-Child Factors & Environmental Factors" (36:36). It is important that a child is evaluated by a qualified health care professional qualified in the management of brain injury. Whether a child is treated on an inpatient or outpatient basis it is helpful to work with a multidisciplinary team that understands the need to have continued reevaluation of a child's skills and strengths (every 3-6 months) over the recovery period. Factors that influence recovery include, but are not limited to: severity of injury, developmental stages and pre-injury functioning.

In the video Dr. Bent and Dr. Deidrick explain factors that contribute to the outcomes after a TBI. Link to Impact of TBI 39:42 minutes at: <https://www.youtube.com/watch?v=5I88ueY6ceI&feature=youtu.be>

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