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UNDERSTANDING THE EFFECTS OF CHILDHOOD TRAUMA ON BRAIN DEVELOPMENT IN NATIVE CHILDREN

By

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BACKGROUND

Children in Tribal communities and Native families are all too often exposed to various types of traumatic events that have the potential to affect their physical and emotional development in ways that cannot be reversed. The trauma can be from neglect, or from physical or sexual abuse inflicted on the child, or it can be from violence that the child witnesses in his/her environment or between people who have responsibility for his/her care. Children also experience trauma by being separated from their mothers or caregivers early in life.

Over the past fifteen years or so, Tribal communities have become increasingly aware of the many forms that child abuse can take. Some Tribes have begun to take action to prevent child abuse and to address the generations of trauma their Tribal members have experienced as children. In the late 1980s, Tribal communities were shocked by the revelation of multiple victim child abuse cases on the Hopi and Navajo Nations. The publicity from these crimes, in which non-Indian BIA teachers sexually abused large numbers of Tribal children, led to increased awareness among Tribal communities about all forms of child abuse. Additionally, community members have become aware of other forms of violence within the family, especially domestic violence.

The extent to which interpersonal violence exists within Native American communities has not been adequately evaluated[1]. However, studies have estimated that the incidence of violence against Native women in marriage (or intimate relationships) occurs at rates from 15-52% (Wahab and Olson, 2004). One study (Robin, Chester, and Rasmussen, 1998) found that their sample of Native American men and women reported a 91% lifetime incidence of interpersonal violence. Even if children are not being *physically* abused by their parent's batterers in these homes where domestic violence occurs, children who witness violence are often profoundly affected developmentally and emotionally. (Margolin, 1998; Margolin & Gordis, 2000)

Many Tribal communities have developed on-reservation services for victims of child abuse and their families. Funding from the Office for Victims of Crime, U.S. Department of Justice through the Children's Justice Act – Partnerships for Indian Communities grants and the Tribal Victim Assistance grants have provided resources to assist Tribes in developing programs to improve interagency coordination and reduce trauma to child victims. These programs have also helped Tribes increase public awareness of the impact of child abuse and support healing for child victims.

New scientific information suggests that victims of childhood traumas, such as abuse, neglect, separation from caregivers, and witnessing violence, may suffer from long-term impairment in how their

[1] For additional information: Violence Against Women Resources, http://www.vaw.umn.edu or contact Sacred Circle: National Resource Center to End Violence Against Native Women: 877-733-7623

brains work. It is important for Tribal service providers, parents, community members and others working with children to be aware of this information. Moreover, it is essential that we understand how children are impacted by trauma in order to help children heal. To help children and adults, it is also important to recognize that traumatized children may suffer irreversible damage to their ability to function that may affect them throughout their lives. The information in this article was compiled to assist victim advocates who work with children and their caretakers to understand how the trauma affects the child's development when abuse has occurred – especially when it occurs early in the child's life. This article should also be helpful to Tribes and Tribal agencies seeking to develop programs and services that will promote healing and wellness for Tribal children. This article also provides basic information that will help extended family members, foster parents, teachers and others who are involved with a child that has suffered trauma early in life.

ONE CHILD'S STORY: I was four years old. My mother is screaming as he beats her, I am screaming and crying. Then I see him walk over to the gun rack and my mother screams, "No David, No!" I see my mother laying on the floor as he walks over to her and beats her with the butt of the shotgun with sickening thud, thud, thud, thud, until what he believed was to death and the only screams to be heard were mine coming from under the table. He calls her a bitch and puts the gun back in the rack, goes to the bedroom, slams the door and I can hear the squeak of the bed as he sits down and the thud, thud of each boot hitting the floor and more squeaking of the bed as he laid down and went to sleep leaving her for dead. I crawl over to my mother and force myself to stop crying and put my face to her mouth to see if she was breathing, I don't feel her breath and I well up with tears believing she was dead. I force myself once again to stop crying and put my head on her chest to see if she was breathing. I feel her chest rise—her breath was very labored, but she was breathing. I wipe the blood from her face as I sat in the dark next to her. I cover her with a blanket and sit by her side all night. I would get very mad at myself if I fell asleep, cause I need to keep checking to see if she was still alive through the night. In the morning my very beautiful mother looked like some Frankenstein experiment, she was all swollen, bruised and deformed, she looked like a monster.

I remember to this very day exactly the layout of the trailer in which this all took place. I remember where the door is, the TV, the couch, the windows, the gun rack, the way the light came in through the window that night, the sounds, the smell, the taste of my tears, the feeling of terror, sadness and the fear of death of my mother. I remember exactly what my mother was wearing - she was wearing blue jeans, white tennis shoes, a white t-shirt that was all bloody, a jean jacket and she was laying on the floor by the couch towards the end of it. I knew I could not have saved her life, but I stayed by her side so that she did not die alone. Whether one considered it a miracle or punishment, my mother survived that one beating, one beating of many, many, many vicious, bloody beatings for years to come. It meant many more years of living in terror for us children. (as told to author by adult woman)

INTRODUCTION

In recent years, increased attention has been given to the link between childhood trauma and brain development. Does childhood trauma actually change how a child's brain develops? How can an external event, like child abuse or neglect, actually change brain development? These questions have generated quite a bit of interest. An internet search using the keywords "brain, child, abuse" yielded 620 articles. One review article, "The Neurobiological Consequences of Early Stress and Childhood Maltreatment," lists 193 references (Teicher, Andersen, Anderson, Navalta, & Kim, 2003). A few years ago, no one seemed to be thinking about whether child abuse and neglect, or other traumatic events such as exposure to domestic violence, can alter the actual, physical structure of the brain.

American Indians may represent the most traumatized segment of the American Population. At least one study (Manson, Beals, O'Nell, Piasecki, Bechtold, Keane, & Jones, 1996) has revealed a high incidence of trauma exposure among American Indian adolescents. According to the Office of the Surgeon General, American Indians and Alaska Natives experience Post Traumatic Stress Disorder (PTSD) at almost three times the rate of the general population, 22% prevalence rate for AI/AN versus 8% for the general population (Office of the Surgeon General, 2001). The impact of trauma on brain development has profound relevance for those working with American Indian youth.

In the following pages, we will examine some of the research that has explored the relationship between childhood trauma and brain development, including a discussion of how the brain develops and how trauma can change the brain. It will also discuss some interventions that can be helpful in dealing with children who are victims of childhood trauma. While the impact of childhood trauma on brain development involves some understanding of basic brain growth, neuronal function, neurotransmitters, and neurochemicals, it is not necessary to have to have any knowledge of science to understand this paper.

WHY IS THE BRAIN IMPORTANT?

What does the brain actually have to do with childhood trauma? The brain is the most important organ in your body. You cannot survive without a brain. There is no machine that can duplicate the functions of your brain. From the time you are born you know how to perform the basic activities that will allow you to survive: breathing, eating, eliminating waste. Your heart beats and your body maintains a healthy temperature. No one has to teach you how to breathe. Your brain controls all of that, without you even knowing about it! The most basic part of the brain (the brainstem and midbrain) controls these vital functions.

As you grow up, so does your brain. Children don't think about things in the same way that adults do. Think about a one year old child that you know. How does that child think about the world? What types of words does the child understand? What kind of "logic" does the child use? How do you explain things to a one year old? Is it the same way you explain things to a 10 year old? No, because a 10 year old can understand much more than a one year old. A 19 year old understands even more than the 10 year old. How does that happen? It happens because the brain continues to develop after birth, processing experiences and "learning". (*Figures 1 A & B)*

When we are born, the most basic parts of our brain work completely. They have to, otherwise we would die. We can survive perfectly well as infants without understanding the world around us. However, as we get older, it becomes more important to understand more complex ideas. So we need to use more parts of our brain as we get older. Talking, walking, and other skills use different parts of the brain than the portion that simply controls breathing.

Figure 1 A

Figure 1 B

The brain is composed of many different parts or systems that control different functions. While the most basic part of our brain is completely functional when we are born, the other parts continue to

develop after birth. The brain is organized so that the basic functions develop first and the most complex functions develop last. The brain develops in order: from least (brainstem) to most complex (limbic, cortical) areas. Different parts of the brain control different functions. The brainstem controls the basic functions such as breathing, heart rate, swallowing, digestion, temperature (Autonomic Nervous System), and effects level of alertness, ability to sleep, and sense of balance (Lehr, R.P., undated). The limbic area is part of the central nervous system that seems to be involved in controlling emotion and memory. Specifically, two areas of the limbic system (the amygdala and the hippocampus) seem to be involved in the processing of emotionally charged memories (Perry, undated). *(Figure 2)*

The Human Brain

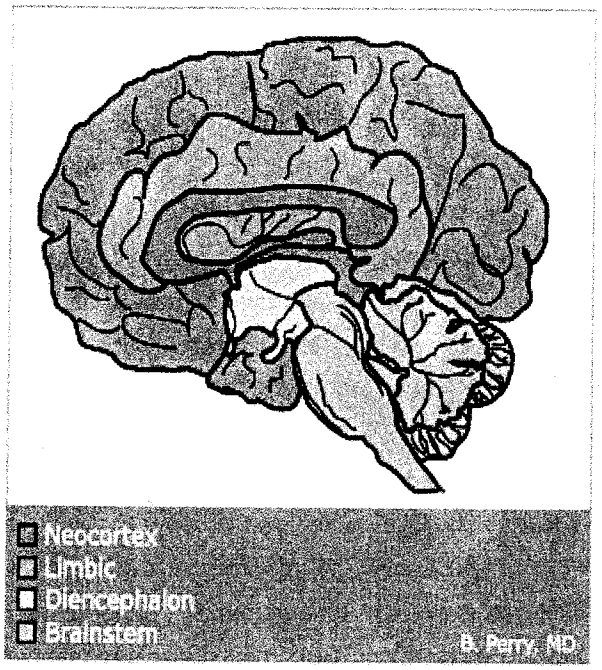

Figure 2 A cross-section of the human brain. Image courtesy of Bruce D. Perry, M.D., Ph.D.

THE DEVELOPING BRAIN

The basic building block of life is the cell. Everything in our bodies is made up of cells. After conception, these cells begin forming into the various parts of our bodies. Some cells form organs, some form tissue, some become nerve cells or neurons. The brain is made up of billions of neurons. These neurons seem to be present as early as two weeks after conception (Perry, 2002). However, these neurons need to develop specific purposes. Some neurons will be involved in motor functions (like walking and talking), some in sensory functions (like seeing or hearing), some in emotional functions (experiencing feelings of happiness or sadness), and some in more complex cognitive functions

The Human Brain

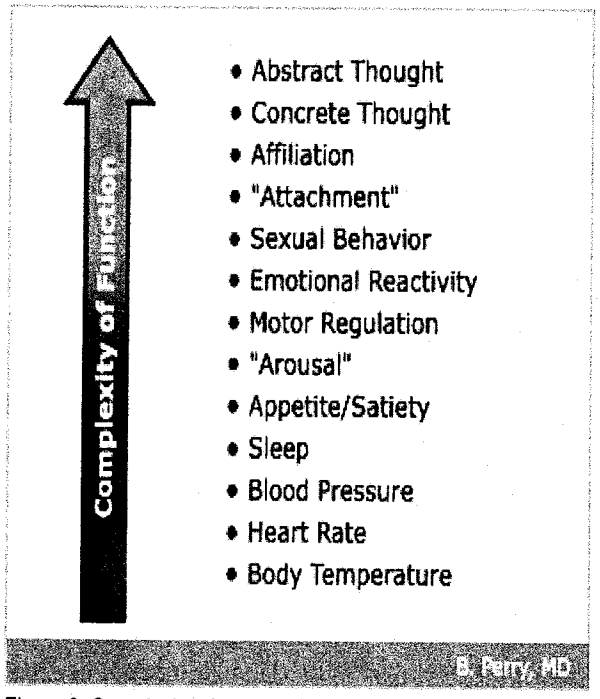

Figure 3 Complexity of brain function, in ascending order. Image courtesy of Bruce D. Perry, M.D., Ph.D.

(reasoning, impulse control, and decision-making). While the initial development of the brain starts soon after conception, the brain continues to grow and develop for many years after birth. In fact, the brain appears to grow until 10 years of age. *(Figure 3)*

However by age 2 a child's brain weighs 75% of what the adult brain will weigh (Carmichael, 1990) and the brain will be almost completely developed by age 5 (Pfefferbaum, Matholan, and Sullivan, 1994). It is easy to understand that anything that interferes with normal development prior to age 5 can actually change how the brain grows. We know that physical damage to the brain early in life can severely impact what the child will be able to do throughout their life. An infant who experiences a blow to the head, for example, may never develop the ability to walk or to learn complex tasks. The type of damage is related to where the brain is injured. Research is suggesting that infants and children who suffer emotional trauma or chronic stress during these crucial periods of brain development may also suffer from life-long problems. In order to understand how these changes take place, it is necessary to understand a little about how the normal brain develops.

The brain develops from cells present in the embryo in the first two weeks after conception. This process is called neurogenesis. Most of the development of neurons in the brain takes place during the second and third trimester of pregnancy. So while most of the neurons that you will need throughout your life are present at birth, the type of activity that each neuron will be involved in (motor, sensory, emotional, and cognitive) develops over time (Perry, 2002). These neurons come together into "systems" such as a system to control the production of speech or a system to control the understanding of speech. Each of these functions develops at a different time.

In order for the brain to develop normally, it needs to receive certain signals at certain points of development. Brain development is dependent upon nothing going wrong during these critical periods. Since different parts of the brain develop at different times, different systems of the brain are particularly vulnerable and sensitive to problems or trauma at different times during the child's development.

If the less complex parts of the brain don't develop normally, then the more complex (or higher) levels of the brain are unlikely to develop normally. Different parts of the brain are interconnected in highly complex ways, so trauma that occurs while the child's brain is developing, may lead to abnormal development of many parts of the brain, not just the part that is developing at the time of the trauma. The impact of trauma during brain development will be discussed in more detail in the next section.

Think about a young child you know. Most children begin to crawl before walking and usually pre-school children understand many more words than they can read. These differences in abilities are due to physical development in the brain: the neurons becoming more organized and more specific in their functions. One way these neurons develop is in response to messages sent between cells with chemicals called neurotransmitters. The neuron receives a chemical message and actually changes because of that message. Then, the neuron sends this new message to the next neuron. For example, when a child touches a hot stove the brain sends a signal from the hand to tell the child that this is hot, so the child will pull his hand away. This is different from the child touching a cool stove. The signals

that the brain sends are different in each case and lead to different results.

If the stove is hot, the signals in the brain, sent by the neurotransmitters, start to "build a file;" the next time that the child touches a hot object, the same types of neurotransmitters are sent along the same pathway. Soon, the child 'learns' not to touch things that are too hot. (*Figures 4 A & B)* This learning occurred because the neural signals were the same, time after time, from the same activity. So when a certain neural pathway gets activated, the child has learned that they should pull their hand away, and, eventually, not to touch the hot object. Repeated experience leads to learning. But the real mechanism of learning is the repeated use of the same neural pathway. This is true whether we are talking about motor memories, cognitive memories, sensory memories, or feeling (affective) memories. Each of these different types of memories is stored in different parts of the brain.

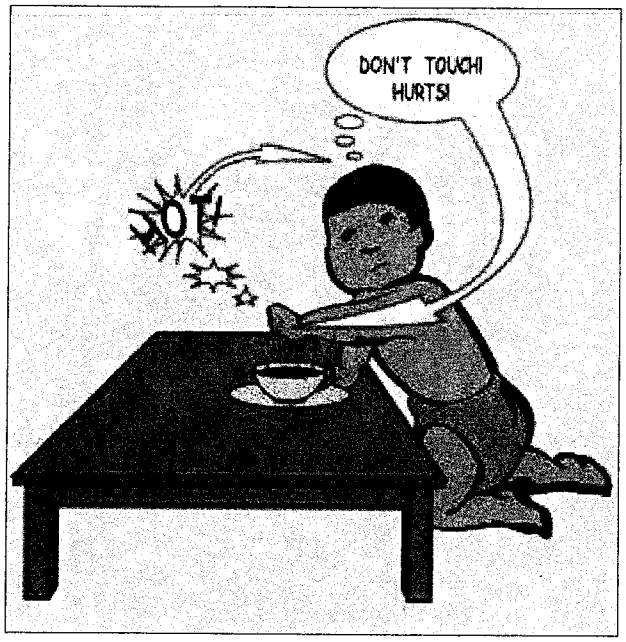

Figure 4 A

The brain stores information in what is called a **use-dependent fashion**. The more the same neuropathway or system is used, the more that pathway and its related roles will be "built-in" or automatic (Perry, Pollard, Blakley, Bakerm & Vigilante, 1995). The more you use neural pathways or systems, the stronger that pathway becomes. On the other hand, the less you use the pathway, the weaker it becomes. Think about a skill you had as a child but haven't used in 10 or 20 years. Can you still use that skill? If so, are you as good at doing it as you were when you stopped using the skill years ago? Probably not. (*Figure 5)*

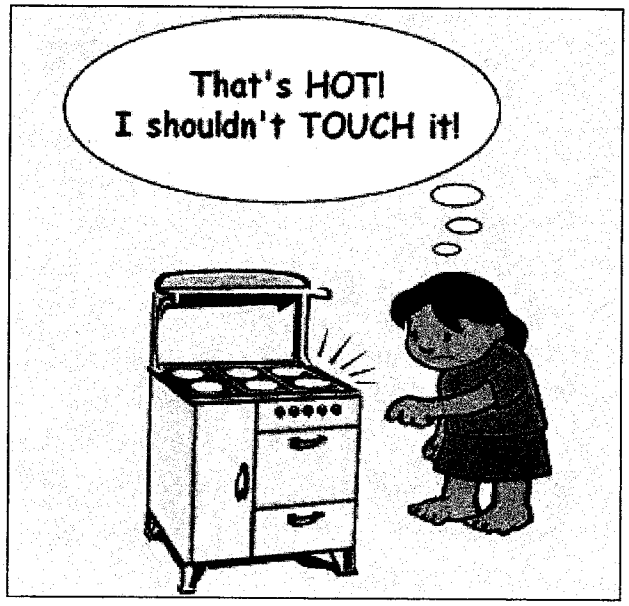

Figure 4 B

Problems can occur when the same pathways are in constant use, such as when a child is in a constant state of fear. The pathways become sensitized, meaning that they are always ready to be activated, with the slightest encouragement from the child's environment. Eventually, even the thought of the

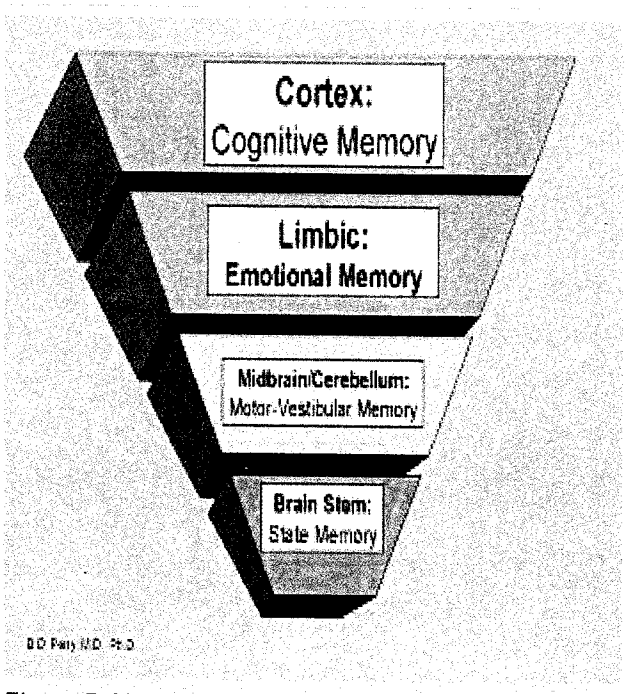

Figure 5 How memory is stored in the brain. Courtesy of Dr. Bruce Perry. Ph.D.

event can cause the body to react as if the event itself had taken place. This type of sensitization can explain hyperarousal, a symptom often seen in traumatized children. This will be discussed more in the next section.

There's one more thing you need to know before we discuss **how trauma impacts brain development**. Previously we discussed how the brain sends messages through chemicals called neurotransmitters. Each neuron has the capacity to receive these neurotransmitters and to send them onto the next neuron. *How does the message get from the child's hand (which is touching the hot object) to the brain and then from the brain (saying to remove the hand from the object) back to the hand? (Figure 4 A)* The messages are communicated using a long chain of these neural transmitters, one brain cell at a time. The neurons receive the chemicals on a part of the cell called the dendrite, the message is conveyed to the inner part of the cell, and then sent to the next neuron when the neurotransmitters are released through a part of the cell called the axon. The axon releases the chemical neurotransmitters and the chemical message is received by the dendrites of the next cell.

However, **the chain of neurons is not solid**. There is space between each neuron. Neurons communicate through neurotransmission that takes place at special places between neurons called synapses. At the synapse, the distance between two neurons is very short. The chemical messages (neurotransmitters) have to cross this gap (called the synaptic cleft). The chemical is released from the first neuron (called the presynaptic neuron) into the space between neurons. When the presynaptic neuron releases the chemical message, it needs to travel across the synaptic gap and be received by the (synaptic receptors) on the next neuron. Think of the axons and dendrites as little branches reaching out into the synaptic gap, waiting to send and receive messages. Each neuron can have hundred of dendrites. Just like the rest of the brain, if these neurons don't get used because no messages are coming through, they will decay and die (a process called apoptosis). If they are overused, they become highly sensitized, so that even the smallest reminder of an event activates the same neural pathways as the actual event itself. Children who are chronically exposed to unpleasant events in their environment may have abnormal neuronal development as the result of over stimulation of certain areas of the brain (Margolian & Gordis, 2000).

TRAUMA AND BRAIN DEVELOPMENT

Much of what researchers know about the impact of trauma on brain development comes from animal experiments. Animals were used because it would be inappropriate and unethical to perform experiments that intentionally traumatized people. However, researchers can actually look at the brains of animals that have suffered a variety of traumas and literally see the physical impact that traumatic experiences have on the various parts of the brain. While such animal studies suggest what might happen to humans, we cannot know for sure that humans react the same way as experimental animals.

Significant brain development takes place around the time of birth in humans. This is the time when there is a high rate of brain growth and development of synaptic sites (those small gaps between cells so important to neuron communication). Any damage or trauma to the brain at this stage could have a long-term, permanent impact on a child's behavior (Anand and Scalzo, 2000).

Because factors outside of the child influence brain development, changes can take place in the brain before a child is even born. Research confirms that maternal drinking or smoking can negatively impact a fetus. There is also reason to believe that psychological factors, such as the fear experienced by pregnant mothers who are battered may create physiological changes that negatively impact the developing fetus.

There is little information about the incidence of domestic violence committed against pregnant women in general (General Accounting Office, 2002) and specifically among Native American women (Williams, 2002). However, one small study of pregnant American Indian women found that 33% reported being battered during their current pregnancy and 55% during a previous pregnancy (Bohn, 1993)[2]. These figures represent the possibility of an alarming

> Linda is a 37 year old mother of 5. Her youngest is a 3 month old girl, who has a different father (John) than the other 4 children. Linda was very concerned during her pregnancy because she had been physically assaulted by the father of the baby during a previous pregnancy, which resulted in a miscarriage. According to Linda, she ended the relationship with John during the pregnancy (because he was attempting to intimidate and control her) by telling him the baby wasn't his. The 3 month old baby nonetheless has been fussy and difficult to calm, possibly showing signs of the stress and trauma experienced by her mother during the pregnancy.

[2] The incidence of domestic violence during pregnancy is an important area for future research (Petersen, R., Saltzman, L., Goodwin, M., and Spritz, A., 1998).

number of Native children who are affected by violence even before birth!

Specific physiological changes related to experiencing fear have been found in the hypothalamo-pituitary-adrenocortical (also known as "HPA") axis (Sandman, Wadha, Dunkel-Schetter, Chicz-DeMet, Belman, Porto, Murata, Garite, & Crinella, 1994; Glover, 1997; Weinstock, 1997). Based on this information, a child who was exposed to these changes in utero may be more vulnerable to stress later in life. Changes in the mother's hormones influence how genes express themselves in the fetal brain, and some of these changes remain through adulthood (Dowling, Martz, Leonard, & Zoeller, 2000).

Many Tribes have "rules" for pregnant women. Such Tribal guidelines for women's behavior illustrate traditional knowledge and acknowledgment that external factors can have a negative impact on the developing fetus. For example, among some Tribes, there are certain activities that pregnant women should avoid because they are believed to present potential harm to the developing fetus. Some Tribes prohibit pregnant women from attending funerals, while other Tribes believe it is bad luck for someone who is pregnant to view certain animals (snakes in one tribe, rabbits in another tribe). These behaviors are prohibited to protect the physical and emotional well-being of the unborn child.

Similarly, some behaviors are encouraged for women who are pregnant because the way the mother conducts herself can also have beneficial developmental impacts on the child. For example, a Native mother may be urged to talk to or sing to her unborn baby, and instructed to listen to other women talk about how to treat a child. Although the exact physiological mechanism of how environmental factors affect a developing fetus may not have been analyzed scientifically, it is clear that the messages from Tribal elders and the practice of Tribal traditions recognized the importance of avoiding harmful or traumatic events during pregnancy.

THE IMPACT OF THE HPA (HYPOTHALAMO-PITUITARY-ADRENOCORTICAL) AXIS

There are many types of factors that appear to be related to changes in brain development. Animal research suggests that a lack of appropriate stimulation for a developing child can impact the chemical messages that are sent in reaction to stress throughout a lifetime (Anand and Scalzo, 2000). While this suggestion is useful for further research, it does not mean that the same results will hold true for humans. However, research on children who have experienced severe stress seems to support these animal studies.

One researcher (DeBellis, 1999), for example, found changes in the developing brains of children in some types of neurotransmitters and hormones that impact neuronal development. He believes that *chronically maltreated* children with a diagnosis of Post Traumatic Stress Disorder (PTSD) show changes in major biological stress systems, including undesirable influences on brain development.

A specific impact of stress and trauma on brain development involves the hippocampus, which is one of the parts of the limbic system, involved in memory and emotion. There is research evidence that people who have experienced chronic stress or trauma actually have a smaller hippocampus than those who have not experienced such trauma (Gilbertson, Shenton, Ciszewski, Kasai, Lasko, Orr, and Pitman, 2002). Since the hippocampus is involved in the integration of memories, disrupted hippocampal development may explain the problems that traumatized people have with dissociation and intrusive memories of the trauma (Margolian & Gordis, 2000).

SEPARATION FROM PRIMARY CAREGIVER

One of the most stressful events in an infant or child's life is separation from their primary caregiver (usually a parent). A young infant needs to attach or bond with an adult caregiver. This attachment or bonding is important not just for the infant's survival, but for the infant's ultimate successful psychological and emotional development as well. In Tribal communities, the child may have many people who can fill the role of caregiver - parents, aunts, uncles, grandparents, clan relatives, godparents, ceremonial relatives, etc. If bonding does not occur with one caregiver, it is possible that a child may still establish a healthy bond if another appropriate caregiver fills the role in a timely manner, thus avoiding long term attachment problems. Bonding with an appropriate adult caregiver can act as a protective factor for an "at-risk" child. However, if a child is abused or neglected by their primary caregiver over a period of time, they may still suffer long-term problems, even though another caretaker steps in. Unfortunately, in Tribal communities as well as mainstream society, there are many examples of parental/caregiver neglect or abuse that have lead to attachment problems in children, which often manifest into serious behavior problems later.

Children who lack early attachment opportunities have smaller brains and lower IQs. (Perry, 2002) The younger the child is when they experience this lack of attachment, the greater the damage. This kind of damage leads to a lack of essential social skills such as feeling empathy and remorse (Perry, 1997), as well as an inability to adjust to changing situations, take defensive action, or act on one's own behalf, and a lack of ability to register feelings and pain (Schore, 2001). It is fortunate that in Tribal communities, there is often greater opportunity for "built-in" extended family and cultural kinship relationships that can help prevent these attachment disorders. If the child's parents are not emotionally or physically available, these other extended family or community members may become critical "objects of attachment" for the child.

Mary was a 21 year old tribal member when she met Mark while they were both attending college in Albuquerque. They began dating and after a while decided to live together. Mark insisted that they live in New Mexico, where he was from, although all of Mary's family was in Arizona. One day, while Mark was giving their baby a bath, Mary heard a scream. She arrived to find that Mark had put the baby into burning hot water. While Mary called for an ambulance, Mark disappeared. Mary was charged with child abuse and awaited trial in jail, since she didn't have any money to make the bail. She was convicted of child endangerment even though she had not harmed the child. Their baby, Carmen, was placed with Mary's parents. Her grandparents provided a loving, stable environment. They accompanied Carmen on her many doctor's visits and stayed with her in the hospital each time she needed surgery. Despite the traumas of being abused, being separated from her primary caregiver, and multiple surgeries, Carmen grew up to be an independent and happy girl. Having a stable nurturing environment with her grandparents and maternal aunts provided Carmen the strong foundation she needed to overcome her traumatic early years.

The brain develops, in part, in response to the infant's experiences. *If the relationship with the primary caregiver is neglectful or abusive, this will have a negative impact on the child's development of appropriate coping skills.* Trauma in early life can lead to problems in maintaining interpersonal relationships, coping with stressful situations, and controlling emotion. The crucial experiences that form a person's ways of coping come from the caregiver-infant relationship (Schore, 2001). Infants who have suffered trauma in their first year of life have difficulty developing working coping strategies.

Trauma experienced prior to age two, may have particularly harmful effects, including biochemical changes that make a developmentally immature, structurally defective right brain. Trauma in infancy may lead to disruption of the development of the right hemisphere of the brain (Schore, 2001), the half that is most involved in the processing of emotions. While extended family or clan members may be available as "substitute" primary caregivers, if the child is not placed in a loving, nurturing environment prior to age two, they may still experience these long term effects. It is well established that infants and young children learn best when they are in a safe, nurturing environment (National Clearinghouse on Child Abuse and Neglect Information, 2001). This environment can be provided by caretakers or other adults who offer positive emotional relationships.

Children may store their memories of abuse in visual images in the right side of their brain. It may be that harm to the right brain is responsible for why some children and adults continue to re-experience the trauma that took place in infancy (Schore, 2001). Children may also store their survival-based responses to abuse in the right brain, using these responses, without consciously being aware of it, throughout their lives. So when children say that they do not know why they acted in a certain way, it may be true. Children may use their old, automatic survival responses, without being actively aware of why they acted the way they did.

There are many biochemical reactions to stress that appear likely to cause long-term changes in the developing brain. Most people are aware of the "fight or flight" response to danger. When a person believes that they are in danger, the body responds by preparing the person to either flee from the danger or to fight whatever is causing the danger. The body's response is primarily biochemical in nature. The body releases what are known as "stress hormones:" cortisol, epinephrine and nor epinephrine (NE), vasopressin, oxytocin, and endogenous opioids (van der Kolk, 1994). The release of these hormones is controlled by a part of the brain called the amygdala, one of the first parts of the brain to develop. These are the neurohormones that allow you to run away quickly or to be ready to fight. These hormones cause a state that is often called hypervigilence, during which the person focuses intensely on the perceived danger, their senses seem sharpened, and they are constantly evaluating their environment for cues related to the danger.

Because of their size or undeveloped motor skills, young children are not prepared to either flee or fight if they are in danger or pain. They rely on their caregivers to protect them from pain and danger, or to remove them from the dangerous situation. So, how do children react to stressful situations? First, they try to alert their caregiver to the danger. This is why infants cry or howl when they are scared. When the caregiver doesn't protect the child, or, the caregiver is the source of the stress, children have limited options. In these situations, children react to stress by attempting to disengage and "disappear" or they become hyper aroused. If no adult comes in answer to the child's crying, eventually the child will give up (called a defeat or surrender response). Instead of crying, the child may freeze. This response makes sense. If no one bigger and stronger is coming to protect you from the threat, perhaps the threat will go away if you are hard to find. If sufficiently terrorized, the 'freezing' may escalate into complete dissociation (Perry, Pollard, Blakely, Baker, and Vigilante, 1995). Perry et. al. (1995) defines dissociation as "disengaging from stimuli in the external world and attending to an 'internal' world." Two common examples of dissociation are daydreaming and fantasizing (Putnam, 1991).

FACTORS IN A CHILD'S REACTION TO TRAUMA

What influences whether a child reacts to trauma by becoming hyper aroused or by dissociating? Age, gender, and the nature of the trauma all seem to play a part in a child's reaction to trauma. The younger the person is, the more likely they are to dissociate. Similarly, the more immobile, helpless, and powerless the individual feels, the more likely they are to dissociate. When physical injury, pain or torture is involved in the traumatic experience, an individual will be more likely to use dissociative responses. Finally there is a clear sex difference, females tend to dissociate more than males (Perry, et. al., 1995). These reactions to trauma are not limited to young children. Adolescents can also react to trauma with hyperarousal or dissociation.

> I was 16 years old, staying with a woman for whom I babysat and she was also like a friend to me. On night, her husband came home drunk about 3AM. My friend and her husband were sitting at the kitchen table and I awoke to her screams and begging him not to hit her. Her husband would tell her to hold still so he could hit her in the face. While this was going on I was totally frozen at first, horrified and thinking that he would come in the room and start hitting me as well. After listening to this for several minutes I finally got up the nerve to run out of the house all the way to the police station and tell I them what was going on. Every time I think of this story I can still feel that terrified, frozen feeling I had back then.

There are no cross-cultural studies that compare the way Native and non-Native children react to trauma. A child who witnesses his/her mother being hit or kicked by anyone, but especially the other parent, may experience trauma. Physiologically, we would expect all children to react the same. A three year old who is being sexually abused by an uncle does not have the ability to physically defend herself. The child may retreat to an inner world, or dissociate, feeling that the abuse is not really happening to them, but that it is happening to another person, or they may feel nothing. For example, abuse by an uncle can be especially traumatic for a Tribal child who may have been taught to hold the uncle in high esteem; often uncles are disciplinarians or hold other special roles and are honored by the family or community. The child may feel that they deserve the abuse as some type of punishment, which may relate to the uncle's role in the family.

A child who dissociates, or puts themselves into an alternate reality may also be misdiagnosed as seriously disturbed. This is especially true if the child engages in fantasies or creates an alternate world that incorporates Tribal beliefs and traditions. Many communities, for example, have some type of spiritual being who will come to the home of a child who misbehaves and threaten to take the child away. If a child were to report to a non-Native therapist (or a therapist unfamiliar with their beliefs and traditions) that an ogre was going to come and take them away to live with the ogre people, they could be misdiagnosed as having paranoid fantasies or being unable to distinguish fantasy from reality. How-

ever, in some communities, not only are these stories told to children, but these beings actually come and visit each child's home as part of the tribe's religious/spiritual activities. So, while the Native child is exhibiting the same reaction to trauma as a non-Native child (dissociation), the content of their dissociative experience may be very different.

At a Tribal Child Protection Team meeting, the Head Start teacher, Sandy, reported concern about a 4 year old girl who was difficult to engage in group activities. The teacher reported that the child often had a "blank stare", that she went off by herself and didn't seem to be aware of things going on around her. Sandy said she usually had to turn the child around and look into her eyes to get her attention. This little girl also rarely talked, had delayed language development and was still not completely potty trained. Sandy told the team she is particularly concerned now because the child has begun to resist being taken home when the father comes to pick her up from Head Start. She said that the child runs and hides when the father comes in the door, and that she screams "no...no... no..." and kicks when the father picks her up and carries her to his truck. The Child Protection Team members had previously discussed the family because of reports of domestic violence in the home, but the mother was unwilling to leave the batterer and resisted offers of services and support. However, during one home visit, the mother had told a social worker that she could not put her children (girls ages 2 and 4) to bed because they screamed, so she let them fall asleep on the floor. The mother also told Sandy that the 4 year old is "spacey" and "doesn't listen". After an investigation, which included a medical examination, the Child Protection Team learned that the 4 year old was being sexually abused by the father and both children were traumatized from witnessing frequent violence toward their mother. After being placed with a nurturing grandmother in another community, the children began to exhibit more appropriate social and emotional behaviors.

TREATMENT APPROACHES FOR TRAUMATIZED CHILDREN

Each child's response to stress and trauma is unique. However, physical and neurological changes in the brain may lead to long-term consequences. Permanent damage cannot be changed, it can only be prevented. Recognizing that trauma may lead to such permanent changes demands early intervention to limit the actual damage that occurs. Support for pregnant women who may be under stress due to family violence is also important to help reduce the possibility of permanent changes in the developing fetus' brain.

Perry has outlined five factors related to the individual's specific response to a trauma: 1) pre-morbid functioning and history, -- specifically history of previous stressors, 2) age -- the neurobiological response patterns appear to change with age, 3) specific cognitive meaning of an event for an individual; 4) the specific nature of the trauma, and 5) presence of exacerbating (loss of caretaker) or attenuating factors (e.g., early intervention). (Perry, et. al., 1995)

> There is a need for early intervention to avoid the development of destructive "use dependent" neural pathways leading to persistent hyperarousal or dissociation. (Perry, et. al., 1995)

GUIDELINES FOR CAREGIVERS

Perry (1999) has developed a guide for caregivers of traumatized children. These guidelines are useful for parents, grandparents, aunts and uncles, and teachers, to assist them in daily interactions with children and to minimize additional trauma. He offers the following guidelines:

- Do not be afraid to talk about the traumatic event.
- Use language the child will understand
- The child will experience and process the very same material differently at different times following the trauma. In the long run, the opportunity to process and re-process many times will facilitate healthy coping.
- Provide a consistent, predictable pattern for the day.
- Be nurturing, comforting and affectionate, but be sure that this is in an appropriate 'context.'
- Discuss your expectations for behavior and your style of 'discipline' with the child
- Talk with the child. Give them age appropriate information.

- Watch closely for signs of re-enactment (e.g., in play, drawing, behaviors), avoidance (e.g., being withdrawn, daydreaming, avoiding other children) and physiological hyper-reactivity (e.g., anxiety, sleep problems, behavioral impulsivity). All traumatized children exhibit some combination of these symptoms in the acute post-traumatic period.
- Protect the child.
- Give the child 'choices' and some sense of control.
- If you have questions, ask for help.

While trauma may alter brain development, Perry (2004) suggests that treatment can lessen the impact of childhood trauma. Specifically, he believes that early, aggressive treatment may prevent traumatized children from developing psychological problems such as PTSD. Treatment involves three aspects: 1) review and recollection of the traumatic experience, 2) providing information about the normal and expected processes of post-traumatic functioning, and 3) focus on specific symptoms. Following a traumatic event, the earlier a child can start therapy the better. From a physiological perspective, it is important to prevent the fear state from becoming the child's normal state of arousal and primary stance in relating to his or her environment. If a child has reacted to trauma with dissociation, it is important to assist that child in developing alternative coping skills. Similarly, it is important to minimize the physical arousal caused by the on-going release of stress hormones.

Children can review their traumatic experience in a variety of ways: talking about it, acting it out, drawing, etc. It may be possible to integrate traditional Tribal activities with helping a child recall their trauma, such as using Tribal stories that can facilitate a discussion of the child's feelings. However, it is important to respect Tribal traditions. For example, in some communities there is a certain time of year that is appropriate for story-telling. In many communities, it is not allowed to talk about a person who has died for a period of time (often one year). Therapists need to respect these beliefs and find ways of helping the child master their experience that do not conflict with Tribal values.

Stories can also be a good way of providing information about the normal reaction to trauma. Many Tribes traditionally use dances to tell stories (e.g. creation stories, or to recount important spiritual events), and developing a dance that helps children understand their current feelings and how they will feel differently in the future may be a means of integrating a culturally appropriate form of expression into psychotherapy. Such integration should only occur if the therapist has a detailed understanding of what is appropriate within the child's community.

Children need to overcome the trauma by developing a feeling of control. When children are traumatized, they will store the memories of the event, including memories of the thoughts, feelings, sensory information (smell, taste, etc.) and reactions to the traumatic event. These memories need to be explored and dealt with therapeutically to prevent long-term psychological difficulties. Children may react to sights, sounds and smells that

A nurturing family or caretaker is a crucial for a child's healing.

merely remind them of the trauma. They may experience increased heart rate and a startle response to seeing someone who looks like the person who abused them. Early therapeutic interventions and a supportive family can assist the child in learning how to calm themselves and counteract the physiological symptoms associated with trauma.

Most Tribal communities have traditional methods for helping children learn to focus their attention. Ceremonies involving a child's passage into puberty often involve days of fasting and/or dancing. These activities require focused attention to overcome physical discomfort. The same techniques that help prepare a young person to dance for hours at a time (e.g. purification, participating in a sweat lodge, listening to elders' stories, participating in spiritual activities) can be utilized to help a child to learn alternative ways of reacting to reminders of their trauma.

Traditional activities such as story-telling, sweat lodges, purification ceremonies, and healing ceremonies may all be useful in helping a child learn alternative ways of coping. Other activities such as hunting, fishing, gathering berries and plants, weaving, carving, archery, canoe building, etc. can all be used as a means of helping children learn to focus on their present feelings and thoughts and can provide a means of retraining their bodies to engage in productive activities in response to memories of the traumatic events. All of these activities can be used therapeutically to help the child take control over the trauma that they experienced or witnessed.

A nurturing family or caretaker is a crucial for a child's healing. When the caretaker is the child's abuser, it will be necessary to identify another adult who can offer the child a sense of safety and a nurturing environment. In cases where a child is removed from home, extended family or clan members may be called upon to offer the child support and nurturance by having an active role in the child's life, including continued participation in family and community activities, learning skills appropriate for the age and gender, and keeping the child connected to other family members. It is important for foster parents to be supportive of these relationships and to help with these activities when possible. In addition, it is extremely important to help Tribal community members understand why children under 5 years of age are at great risk for life-changing traumatic experiences. It is critical that Tribes develop services to address the needs of these vulnerable children.

While the use of medication with children continues to be controversial, some researchers recommend a combination of psychotherapy and medication. In conjunction with psychotherapy and social skills training, De Bellis (1999) recommends psychopharmacological treatments for maltreated children who suffer from PTSD. These medications help dampen and quiet the activity of the major biological stress systems. Treatments may prevent the secondary long-term adverse psycho-biological consequences of traumatic stress in these children (Gilbertson, et. al., 2002). Any time that children are treated with medication, they should be carefully monitored to ensure that they are receiving appropriate dose of the medication only for the necessary amount of time.

HISTORICAL TRAUMA AND GRIEF: THE INTERFACE OF HISTORICAL TRAUMA AND ABUSE

While American Indian children experience childhood traumas from abuse and neglect, they may also experience historical trauma and grief the result of hundreds of years of oppression and domination. There is currently no published research exploring the impact of historical trauma on brain development. We do not know how the experiences of American Indian and Alaska Native people throughout the past generations may have permanently impacted physiological development. If the experience of childhood abuse and neglect can change the structure of the brain, what impact did colonization, massacres, and forced confinement have on the physiological and psychological development of the indigenous people of the past?

Some researchers are beginning to explore the psychological impact of this history. The physiological impact, if any, remains unexplored. However, it is reasonable to believe that historical trauma could predispose American Indian children to increased vulnerability to stress and trauma. Because the treatment approaches discussed above were developed and utilized on non-Indian populations, it is important to consider treatment for Native people in the context of historical trauma as well as current events. As discussed in the section on "Treatment Approaches" above, effective treatment programs for traumatized American Indian children must have a cultural basis. Segal (2003), for example, found that key treatment approaches with Alaska natives incorporated spirituality, community support, ceremonies, elder involvement, Native values, Native staff and Native peer support. He also advocated that historical trauma and multi-generational grief should be incorporated in treatment.

Yellow Horse and Yellow Horse Brave Heart (2004) define historical trauma (HT) as the "cumulative emotional and psychological wounding, over the lifespan and across generations, emanating from massive group trauma experiences." Based on the experiences of the Lakota Sioux, they have developed the Historical Trauma & Unresolved Grief Intervention (HTUG). While an in-depth discussion of the HTUG is not possible here, a brief overview is provided to offer readers an idea of the types of interventions that may be appropriate with American Indian children who have experienced trauma.

> The HTUG is a psycho-educational group intervention targeting parents, with the goal of reducing mental health risk factors and increasing protective factors for children. The three major components include education about traumatic Tribal history and its impact on current trauma, utilization of visual stimuli to facilitate processing of that trauma, and fostering a re-connection to traditional Tribal cultural values that can serve as protective factors, and promoting group collectivity, bonding, and ego-enhancement as well as emotional containment by using traditional Native rituals (Brave Heart, 1998; Silver & Wilson, 1988, Yellow Horse & Yellow Horse Brave Heart, 2004).

The HTUG utilizes a number of techniques that have been identified as therapeutic for other types of trauma victims. These techniques include: group sharing, using stimulus items to assist recovery of repressed memories, and providing information about traumatic history and reactions to that history. They also add a traditional Native practices component to facilitate processing and releasing emotions related to the trauma and transcendence.

CONCLUSION

Tribal communities have long utilized holistic approaches based on a broader and more comprehensive world view to address social problems and other challenges. Through the grants from the Office for Victims of Crime, Tribal victim assistance programs and a variety of Tribal child abuse response projects are demonstrating a unique and powerful merging of traditional values and practices with mainstream efforts such as the multidisciplinary team meetings to provide support to child victims and their families, assist victims with the healing process, and to assure that the non-Native justice systems are accountable to the needs of victimized children.

Multidisciplinary teams (MDTs and/or CPTs) include representatives of Tribal, federal and often state agencies that have some level of involvement with Tribal children and families: law enforcement, mental health, medicine, education, victim assistance, and the court system. When the Tribe takes the lead role in directing the work of the MDT or CPT, the needs of Tribal children are more often met and the non-Indian members of the team are able to improve their skills in working with Tribal members. Team participants from the medical field have typically been utilized to explain a child's medical condition, including physical and behavioral conditions suggestive or resulting from abuse and neglect. Until recently, information and training on the long-term impact of child abuse and neglect on brain development has not been available to medical professional or others, so there may be limited knowledge about these effects among those who are diagnosing and developing treatment plans for child abuse victims.

Additionally, since there is limited understanding of the true type and extent of changes in the brain of abused and neglected children, few mental health providers may be aware of appropriate interventions. The members of MDTs and CPTs working in Tribal communities must become more knowledgeable about the long-term implications of abuse and neglect based on the new research on the impact of trauma on brain development and must also understand the historical context for the Tribal community they serve. Victims of childhood trauma may be involved with the child protection and justice

systems as adults, and the effects of trauma on their development has probably not been considered. For both child victims and adults with untreated childhood trauma histories, understanding how trauma effects brain development is essential to the development of effective treatment methods and overall support for healing.

Finally, new intervention strategies must be designed, utilizing culture and tradition and taking into account the impact of historical grief and trauma. Community-based programs must be focused on preventing childhood exposure to trauma, including in utero! For it is ultimately only by keeping children safe (including before they are born), that Tribal communities can be certain of preventing changes in brain development that may impact their children for generations to come.

A Tribal victim advocate was called to a sexual assault victim's house. When the advocate arrived at the victim's home, she was told that the victim's four year old daughter had also been sexually assaulted. The advocate called the Tribal police and took the little girl outside of the house to wait for the police. While they were waiting, a neighbor rode up and started talking to the advocate about how someone had stolen his vehicle. The advocate informed him that the police should be arriving soon and he could report the theft. At that point the neighbor jumped off his horse and began to beat up another man, who he thought had stolen his horse. The Advocate was concerned about the four-year old girl witnessing such violence. However, the young girl just sat there, with no emotion or expression on her face. Violence was a common occurrence in her life and she had learned to block her feelings and reactions.

GLOSSARY OF TERMS

Behavioral Impulsivity

Acting without thinking or without believing that you can control your own actions. As we mature, we develop the ability to control our behavior. You may get angry at someone and feel like hitting them, but your thoughts (e.g. "it is wrong to hit people") and your emotional development (e.g. being able to calm yourself down) help you to avoid acting in ways that are inappropriate. Some children, however, simply act or react, without being able to think about their behavior or take another course of action. These children will tell you "I couldn't stop myself" or "I just did it before I could think about it."

Cognitive

Thinking. Cognitions are another word for thoughts. When we talk about cognitive development, we are referring to the development of the ability to form increasingly complex thoughts and ideas.

Dissociation

Dissociation is simply disengaging from stimuli in the external world and attending to an 'internal' world (Perry, et. al., 1995). Separating from your own physical body, feeling as if your body does not belong to you. A person may separate themselves so much from their body that they retreat into their own world. Many abuse survivors talk about "leaving their bodies" while the abuse occurs. It is as if they were somehow separated from the body that is being abused. In extreme forms, the child cannot feel what is actually happening to their body and completely withdraws to their own "inner" world.

Hyper vigilance

Being highly aware of everything in your environment, being overly sensitive and having an exaggerated response to activity, smells, sounds, etc. because of a need to detect whether something is threatening or danger is near. A hyper vigilant person will be unable to concentrate because he will be paying extreme attention to every sight, sound, and smell all around at all times. All of a person's senses are focused on preventing pain or abuse: they may be described as constantly on edge, or tightly wound.

Hyperarousal

Hyperarousal is a state of "high alert." The body is physiologically ready for fight or flight virtually all of the time, so the person "over-reacts" to the smallest event. Children who have been abused may constantly be checking their surroundings. There are certain chemicals (neurotransmitters) released in the brain that are associated with hyperarousal.

Neurotransmitters

Chemicals that are released in the brain that send messages to the neurons throughout the body. The type and quantity of neurotransmitter released leads to different behaviors. Certain types of neurotransmitters are released in response to threat or trauma. These neurotransmitters control the physiological and psychological response to stress.

Synapse

The gap that serves as a connection pathway between two neurons.

Use-dependent fashion

Neural pathways develop in what is known as a use-dependent fashion: the more the pathways are used the stronger they become. Neural pathways that are used often become very strong; the neural pathways that are not use very often are weak and may even disappear. If pathways are over-used, they become sensitized. What this means for traumatized children is that the pathways that are associated with stress (such as the fight or flight response) are overworked. Just the slightest cue will cause the child to react as if they are being traumatized again.

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The Tribal Law and Policy Institute (the Institute) is an Indian owned and operated non-profit corporation organized to design and deliver education, research, training, and technical assistance programs which promote the improvement of justice in Indian country and the health, well-being, and culture of Native peoples. The Tribal Law and Policy Institute publishes the Tribal Court Clearinghouse (www.tribal-institute.org).

The Institute was created in 1996 through the combined efforts of those concerned with the improvement of tribal court systems and the fair administration of justice in Indian country. The Institute focuses upon collaborative programs that provide critical resources for tribal court systems, victims assistance programs, and others involved in promoting the improvement of justice in Indian country. The Institute seeks to facilitate the sharing of resources so that Indian Nations and tribal justice systems have access to low cost resources that they can adapt to meet the individual needs of their communities.

The Institute seeks to establish programs which link tribal justice systems with other academic, legal, and judicial resources such as law schools, Indian law clinics, tribal colleges, Native American Studies programs, Indian legal organizations and consultants, tribal legal departments, other tribal courts, and other judicial/legal institutions. The underlying philosophy is that tribal courts and Indian people are best served by shared access to existing information and resources - so that each tribe and tribal court does not have to "reinvent the wheel."

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