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## **Therapy – The Brain’s Second Chance**

Our understanding of brain development and brain functioning has increased dramatically over the past several decades. This understanding enables therapists to conceptualize more clearly what happens for children who are abused. It also highlights what therapy needs to provide for these children, adolescents, and adults if they are to have the ability to interact in a healthy manner within themselves and within the world. Increased understanding of brain flexibility provides hope for individuals who have been abused and for those who work with them.

When an infant is born, the brainstem (basic body functions) and midbrain (arousal, appetite/satiety) are functioning. Through the early months the limbic system (emotional reactivity, motor regulation, attachment) starts developing and then, with the second year of life, the cortical areas (concrete thought and later abstract thought) start developing. The brain is like a muscle--the more an area is stimulated, the larger (more complex) it grows and the more that area of the brain contributes to the individual’s ongoing functioning; the less it is stimulated, the less that area contributes to ongoing functioning. Brain changes, both development of functioning and loss of functioning, continue throughout an individual’s life.

When trauma (direct abuse or indirect abuse—i.e., surrounding chaos) occurs during the early months of life, the brainstem and midbrain are bombarded with stimulation. This leads to increased growth within this area thus creating a higher than normal level of arousal activity. This evidences itself within the developing child as hypervigilance, hyperarousal, and increased anxiety and/or impulsivity. If the stimulation is beyond what the brain can accommodate, the activity of this area is likely to “shut down” and the infant/toddler fails to thrive or fails to form integrative functions. Failure of early integrative function has been conceptualized as a determinant of early dissociation.

These same children often experience neglect as they start to develop (the time during which the limbic system and then the cortical areas are starting to function). With decreased stimulation (absence of emotional responsiveness and cognitive input), these areas of the brain experience less growth (complexity) thereby leading to decreased ability to moderate emotions, experience empathy, and problem-solve. The brain functions that are needed to modulate and integrate the overly-stimulated or the shut-down midbrain are themselves compromised and unable to perform this function.

With later abuse, the effect on brain functioning will be determined to some extent by the functioning level already established. If the thinking or cortical area of the brain is able to make sense of what has happened (making sense does not imply healthy reasoning but does imply reasoning that is adaptive for survival) there is likely to be less effect on the lower parts of the brain. If “sense” cannot be made, then the limbic and midbrain areas become more engaged/aroused and hyperarousal, hypervigilance, anxiety, impulsivity, and altered emotional regulation is experienced. When trauma is extreme, dissociation of feelings, sensation or knowledge may be used as a mechanism to avoid the total reality of what is happening. As the brain learns to dissociate or to use some other defence mechanism that makes life easier, the neuronal pattern supporting this form of responding is strengthened. As the response pattern is strengthened, it becomes more automatic.

At the same time physiological changes are occurring in the brain, there are also with trauma changes in neurotransmitters. Trauma has been found to cause an increase in adrenalin and noradrenalin thereby leading to increased heart rate and blood flow, increased agitation, narrowed attention, and poorer organizational skills. Endogenous opiates also increase leading to decreased pain and decreased memory consolidation (a relevant factor in the development of dissociation). With trauma, serotonin levels decrease leading to decreased ability to regulate emotional arousal.

Given these changes, what is it these children, adolescents or adults need? They need exactly what was not there when the brain was first developing. They need a setting that is calm, structured, dependable and consistent (the opposite of the chaos experienced). They need responding that includes the recognition of the self though mirroring, reflecting, and noticing (the opposite of the neglect experienced). They need content which includes a different relationship from the abusive one, recognition of the abuse-distorted messages they have internalized about themselves and their world, and experiences which counter these internalizations (the opposite from the hurtful and other-focused experiences imposed on them during abuse).

Good therapy provides this – a calm, structured, dependable and consistent setting that enables, over time, the super-alert function of the midbrain to modulate. The mirroring, reflecting, and noticing occurring within therapy provides validation not only of the individual but also of the early painful experiences. As the inside experience is matched, the limbic system (emotional reactivity) experiences greater equilibrium. This increased equilibrium provides an internal stability that appears to enable the cortical area of the brain to function more effectively. The brain becomes able to recognize better the characteristics within the environment that are making the world safer than in the past and the characteristics within the self that are positive and strong. The healthy and respectful relationship developed with a therapist, provides within the cortical area a prototype for healthy attachment. New information regarding the

self and the world becomes more evident and, in time, the individual is able to replace the negative abuse-related internalizations held within the brain with positive internalizations.

As these shifts occur, neurotransmitter levels may be re-regulated. In situations where this does not automatically happen, individuals can develop the skill of talking within themselves in such a way as to calm the increased agitation, recognize the pain or memory gaps, and regulate emotional arousal. As this skill, learned originally at the cortical level of the brain, is matched by the environment (in therapy and increasingly outside therapy) thereby creating a new and coherent experience for the individual (i.e., the brain), a calming can occur for the more central areas of the brain.

Whatever theoretical base a therapist works from, an understanding of the developing brain and the effects both of abuse and of therapy on the brain is important. Early developmental, attachment, and relational theories help therapists understand the setting and relationship an individual needs. Psychodynamic and psychoanalytical theories help the therapist grasp the internal conflicts and abuse-related internalizations that need to be addressed. Cognitive-behavioral theory helps therapists develop situations (both within and outside the therapy setting) through which both children and adults can experience and start to internalize a non-abusive sense of self and world.

As this happens, new brain connections are stimulated. Brain activity, at all levels, moves away from old neuronal pathways into newer, healthier pathways.