

Neuroscience and Trauma-Specific Care

Working effectively with survivors of trauma requires practitioners to use approaches that are informed by neuroscience (the structure or function of the nervous system and brain). Approaches designed by Bessel van der Kolk, Bruce Perry, Peter Levine, and others include:

- assessing the key systems and areas of an individual's brain that have been impacted by trauma
- selecting therapeutic, enrichment, and educational activities to help the survivor revisit and/or regain a more standard or typical developmental trajectory

For many Indigenous peoples in Canada, the medicine wheel can be employed as a culturally appropriate methodology for assessing, describing, and revisiting the stages of human development.

For example, an assessment might reveal that a 10-year-old child survivor of trauma has the self-regulation skills of a two-year-old, the social skills of a five-year-old, and the speech and language capability of an eight-year-old. This assessment informs the design of specific therapeutic interventions for the child. It would start with the lower brain (or brainstem) area, which contains nerve fibres that carry signals to and from all parts of the body and regulates body functions such as consciousness, fatigue, heart rate, and blood pressure. As improvements are observed, the therapy would move sequentially up the brain. In the case presented, this might involve initially focusing on the poorly organized brainstem and related self-regulation by using drumming or massage. Once there is improvement in self-regulation, the therapy would move to more relational-related problems (limbic system), using activities like play or art. The table below provides the theoretical framework for the approach.

Framework for Promoting Child Neuro-Development

Developmental Age	Sensitive Brain Area	Critical Functions	Primary Goal of Development	Optimizing Experiences	Enrichment Activities
0-1	Brainstem	Regulation of arousal	State regulation; flexible stress response	Rhythmic and patterned sensory input; auditory or tactile	Massage, rhythm, touch
1-2	Midbrain	Integration of multiple sensory inputs; motor regulation	Sensory integration; motor control affiliation	More complex movement; simple narrative	Music, movement, touch
1-4	Limbic	Emotional states; social language; interpretation of social information	Emotional regulation; attachment; empathy	Complex movement; narrative; social experiences	Dance/play, art, discovery of natural world
2-6	Cortex	Abstract cognitive functions; social/emotional integration	Abstract reasoning; creativity	Complex conversation; social and emotional experiences	Storytelling, drama, exposure to performing arts

Integrating a neuroscience approach into a variety of settings, including preschools, shows promise for helping heal children who have experienced trauma.

Cultural differences can influence the implementation of this framework. However, the framework aligns with many Indigenous cultural practices, and there are links between the framework and Indigenous healing ceremonies that show an overlap between Western scientific concepts of neurodevelopment and pre-colonial Indigenous cultural practices.

Healing ceremonies have the capability to promote healing and recovery because they provide patterned, repetitive stimuli (such as words, dance, and song) required to influence and modify the impact of trauma, neglect, and maltreatment on key neural systems. Indigenous healing practices also promote healing and recovery through their emphasis on social connections and relationships. Many ceremonies are intensely relational experiences, with family and clan participating in the ritual, retelling the story, holding each other, dancing, singing, eating, sharing, creating images of the narrative in sculpture and drama, and reconnecting the loved one to community.

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