

# Areas of professional development in chiropractic pediatrics. Beyond the adjustment

Sue Weber Hellstenius, DC, MSc (Paeds), FEAC, FRCC, private practice, Taby, Sweden

Email: [dr.sue@telia.com](mailto:dr.sue@telia.com)

Wirsensväg 11, 18650 Vallentuna

46 723 10 15 24

## ABSTRACT

**Objective:** This paper outlines the urgent necessity for the chiropractic profession to transition from a primary focus on spinal manipulation to a comprehensive model of pediatric care. This model integrates infant motor development, targeted pediatric rehabilitation, and vigilant adolescent sports injury management to solidify the chiropractor's role as a primary musculoskeletal specialist. **Methods:** By synthesizing current research in neurodevelopmental plasticity, sensorimotor integration, and global health standards, this framework identifies three critical pillars for professional growth:

1. Infant Neuro-Development: Emphasizing the achievement of sequential motor milestones and the use of objective assessment tools like the Alberta Infant Motor Scale (AIMS).
2. Pediatric Rehabilitation: Focusing on age-appropriate core activation and adherence to WHO guidelines for physical activity.
3. Sports Injury Vigilance: Prioritizing growth plate protection and ethical advocacy for the developing athlete.

**Findings:** Research suggests that persistent postural asymmetries, such as torticollis and plagiocephaly, can disrupt symmetrical afferent input during "critical periods" of brain development. This may lead to atypical functional lateralization and subsequent motor or visuo-spatial delays. Targeted clinical interventions and structured parent education are shown to counteract these imbalances, bridging the gap between clinical treatment and long-term developmental wellness. **Conclusion:** To secure its position within the primary care landscape, the chiropractic profession must prioritize continued research into manual therapy and functional rehabilitation for the pediatric population. By fostering symmetrical brain stimulation and advocating for the long-term well-being of the developing child over immediate performance outcomes, practitioners can significantly impact the trajectory of pediatric health and injury prevention.

To fulfill our role as primary musculoskeletal care specialists for the pediatric population, the chiropractic profession must urgently deepen its focus in several key areas, moving beyond basic spinal adjustment to comprehensive developmental care.

Chiropractors who care for children must elevate their competency to become experts in sequential motor milestone achievement. The infant's primary task in the first year is to develop core stability through a series of these sequential motor steps.<sup>1</sup> Our management strategies must reflect this by incorporating the Alberta Infant Motor Scale (AIMS) as a tool to assess motor development.<sup>1</sup> AIMS can also be used as a guide for training as well as the specific motor training techniques described by Kolar in *Clinical Rehabilitation*.<sup>2</sup> Clinically this has been shown to be effective in helping infants meet their motor milestones.<sup>3</sup>

- Understanding postural asymmetry: Practitioners must recognize how common findings like torticollis and positional plagiocephaly affect motor development and create unilateral stimulation and dominance.<sup>1,4</sup> This asymmetry impacts both efferent output and afferent

input, potentially affecting motor development and brain hemisphere activation.<sup>4</sup> The following works support the concept that the infant brain's organization is highly susceptible to environmental and sensory input. Hench's work on critical periods emphasizes that early life is a window where sensory-driven activity is essential for setting up stable neural circuits, suggesting that asymmetrical input during this time could set up asymmetrical circuits.<sup>5</sup> Stile's work discusses how neural plasticity is a central feature of normal development, allowing the brain to be shaped by among other things, asymmetrical posture/sensory experience during the postnatal period.<sup>6</sup>

Vlaskamp's review links plagiocephaly with subtle delays in sensorimotor milestones, suggesting that the asymmetrical input is impacting the developing sensorimotor cortex and control pathways.<sup>7</sup> Korpela research focuses on the association between skull deformation caused by postural asymmetry and subtle motor and cognitive delays.<sup>8</sup> Elik's work describes how AIMS can be used as a tool to assess motor aspects of neurodevelopment in infancy and early childhood.<sup>4</sup>

Essentially, persistent asymmetrical sensory input during a critical period of development can reinforce, or fail to challenge, a pre-existing or temporary motor asymmetry, potentially contributing to atypical functional lateralization and resulting in motor or visuo-spatial delays.

The following references support the idea that atypical motor asymmetry, or the lack of symmetrical development, may be an early indicator of wider neurodevelopmental differences.<sup>9,10</sup>

- **Effective Parent Education:** A crucial skill is the ability to teach parents practical, age-appropriate exercises so they can actively work with the infant at home to counteract postural imbalances and promote symmetrical development. This bridges the gap between the clinical treatment and the infant's ongoing developmental needs.

## 2. Targeted Rehabilitation for Toddlers and Young Children

Management of toddlers and young children requires a targeted, yet engaging, approach to rehabilitation that aligns with global health initiatives<sup>11</sup>:

- **Core Activation:** Clinical focus should be on activating core muscles directly involved in the presenting problem. This requires a strong understanding of age-appropriate exercise modifications.
- **Adherence to Global Health Standards:** We must acknowledge and utilize guidelines, such as those implemented by the WHO for preschool motor skills, recognizing that our interventions influence activity levels and contribute to healthier weight profiles through childhood and adolescence.<sup>11</sup>
- **Practical Instruction:** To ensure compliance and success, practitioners must master the skill of introducing exercises to both the child and parent, often limiting instruction to one exercise at a time to prevent overload and ensure correct performance.

## References:

1. Piper M, & Darrah J. Construction and validation of the Alberta Infant Motor Scale (AIMS) *Journal: Canadian Journal of Public Health Year. 1992;* (83) S46-50.
2. Kolár P. et al. (2013). *Clinical Rehabilitation*. Alena Kobesová, Praha. ISBN 978-80-905438-0-5.
3. Alaa H, & Ahmed M. Effect of dynamic neuromuscular stabilization versus sensory motor training on balance and functional ability in children with hemiplegic cerebral palsy. *The Medical Journal of Cairo University*. 2020;88(1)169—176.
4. Eliks M, & Gajewska E. The Alberta Infant Motor Scale: A tool for the assessment of motor aspects of neurodevelopment in infancy and early childhood. *Front Neurol*. 2022;13:927502.
5. Hensch T. K. Critical period regulation. *Annual Review of Neuroscience*. 2004;(27) 549—579.

## 3. Vigilant and Responsible Sports Injury Management

In the arena of sports injury, particularly for the growing and developing child or adolescent, the profession must commit to heightened diagnostic and management vigilance:

- **Recognition of Severity:** We must overcome the tendency to underestimate the seriousness of injuries in young athletes. Injuries involving growth plates (physes) must be prioritized and require conservative management with basic core training as a priority.
- **Appropriate Management:** Growth plate injuries must not be managed aggressively to avoid further tissue damage. Rehabilitation requires core training to be implemented at a very basic level initially, slowly progressing only after healing is secure.<sup>12,13</sup>
- **Ethical Advocacy:** Practitioners have an ethical responsibility to protect the athlete's long-term health. This often involves navigating and pushing back against pressures from highly driven parents and coaches who may prioritize team victory over the athlete's safe and complete recovery.<sup>14,15</sup>

In closing, we cannot underestimate the importance of continued research focusing on manual therapy and rehabilitation for infants, children and adolescents to secure our position as primary care givers for this population. The impact of timely treatment and rehabilitation has been shown clinically, now we need to demonstrate these results on a larger scale. Age-appropriate rehabilitation where the core muscles are engaged is necessary for not only symmetrical brain stimulation but for injury rehabilitation.

Our work should extend from providing parents of infants, toddlers and children with preventive suggestions, appropriate milestone guidelines and therapeutic approaches to attain their goals as well as the inclusion of guidelines for coaches and parents to foster a supportive environment that prioritizes the developing athlete's long-term development, intrinsic motivation, and well-being over immediate performance outcomes.

6. Stiles J. Neural plasticity and cognitive development. *Developmental Neuropsychology*. 2000;18(2):237-272.
7. Vlaskamp D, Kooten I, Arentze, I, van Schie, P. Sensorimotor development in infants with plagiocephaly: a systematic review. *Developmental Medicine & Child Neurology*. 2020;62(12):1339-1348.
8. Korpela R, Pihlaja P, Kauppila M. Motor development in children with and without positional skull deformation: a systematic review and meta-analysis. *Developmental Medicine & Child Neurology*. 2018;60(1):22–30.
9. Öhman A, Nilsson S, Lagerkvist AL, Beckung E. Are infants with torticollis at risk of a delay in early motor milestones compared with a control group of healthy infants? *Developmental Medicine & Child Neurology*. 2009;51(7):545–550. doi: [10.1111/j.1469-8749.2008.03195.x](https://doi.org/10.1111/j.1469-8749.2008.03195.x).
10. Cabrera-Martos I, Valenza MC, Valenza-Demet G, Almeida-Leyva J, Rodríguez-Ferrer ME, Castellote-Caballero Y. Impact of Posterior Deformational Plagiocephaly on Motor Development. *Pediatric Physical Therapy*. 2016;28(2):153–158.
11. Willumsen J, Bull F. Development of WHO Guidelines on Physical Activity, Sedentary Behavior, and Sleep for Children Less Than 5 Years of Age. *Journal of Physical Activity and Health*. 2020;17(1):96–100. doi: [10.1123/jpah.2019-0457](https://doi.org/10.1123/jpah.2019-0457).
12. Long C, Ranellone S, Welch M. Strength and conditioning in the young athlete for long-term athletic development. *HSS Journal: The Musculoskeletal Journal of Hospital for Special Surgery*. 2024;20(4):444–449. doi.org/[10.1177/15563316241248445](https://doi.org/10.1177/15563316241248445).
13. Beck B, Drysdale L. Risk Factors, Diagnosis and Management of Bone Stress Injuries in Adolescent Athletes: A Narrative Review. *Sports*. 2021;9(4):52. doi.org/[10.3390/sports9040052](https://doi.org/10.3390/sports9040052).
14. Baker Ashley S, McCrea Mark, McAllister-Deitrick Jennifer. The influence of coaches and parents on youth athletes' injury reporting and recovery. *International Journal of Sports Science & Coaching*. 2023;18(3):712–720.
15. Post EG, Biese KM, Hetzel SJ, Trane FG, Sarno KA, McGuine TA, et al. The association between sports specialization and coaching/parental pressure with injury history in youth athletes. *Journal of Science and Medicine in Sport*. 2020;23(4):351–355.