

# Improvement in Speech, Primitive Reflex Integration and Neurodevelopmental Dysregulation in a two-year-old male under Chiropractic care: A Chiropractic paediatric case report

---

Jenna Godfrey, Ruth Postlethwaite and Clare McIvor

---

**Background:** A two year old male was presented for Chiropractic care by his mother with chief complaints of delayed speech, generalised low postural tone, persistent primitive reflexes, emotional dysregulation, and general fussiness.

**Intervention:** The patient received a short course of Chiropractic care, with all interventions modified to be age appropriate. This included diversified, drop-piece, and activator-assisted spinal and pelvic adjustments, cranial releasing techniques, soft tissue work, and a prescribed home exercise programme targeting left-body stimulation, proprioceptive joint distraction, and gross motor activation.

**Outcomes:** The patient's mother noted fast and notable improvements in social engagement, speech, imaginative play, emotional regulation and gross motor competence, alongside the chiropractors observation of improvements in objective findings. The patients health index also rose from 58/100 to 82/100 (within the target range) over the course of care.

**Conclusion:** This case demonstrates an association between subluxation-based Chiropractic care and rapid improvement in speech, neurodevelopment, and emotional regulation in a two-year-old male with persistent primitive reflexes. This is consistent with the core Chiropractic paradigm, wherein subluxation may impact developmental maturation, and that Chiropractic care may facilitate improved nervous system function.

**Indexing Terms:** Chiropractic; Subluxation; paediatrics; delayed speech; primitive reflexes; emotional dysregulation.

## Introduction

In the last decade Chiropractic researchers have made significant leaps in the evidence for the neurological impacts of Chiropractic, and the

... After twelve weeks, the patient remarked 'I'm so happy I can talk now ...'

prevalence of neurodevelopmental disorders in children has increased by 40%.



We now have research indicating that Chiropractic care increases neural plasticity and sensorimotor integration. (Haavik and Murphy, 2007; Haavik and Niazi, 2024) While these studies were undertaken using adult populations, there is an increasing amount of case report data detailing individual cases of paediatric patients showing indications of neurodevelopmental improvement, including integration of retained primitive reflexes, concomitant with Chiropractic care. (Doyle, 2021; Fairest and Russell, 2019; Steinberg and Postlethwaite, 2022)

Additionally, a retrospective study of 37 paediatric patients with neurodeflective (also known as neurodevelopmental) disorders showed significant improvements in autonomic nervous system balance following subluxation based care. (Holt and Spoelstra, 2022) The study, which used clinical and educational tools to assess progress, revealed significant improvements in processing, engagement, learning and connection to surroundings across the cohort.

But perhaps most notably, statistics emerging in 2022 have revealed that in the decade prior, diagnoses of autism and other neurodevelopmental disabilities increased by 40%. (Shaw and Williams, 2022) This represents a significant challenge for parents and health professionals alike. Moreover, it is a challenge for Chiropractors and Chiropractic researchers to enter the conversation when it comes to bringing these two worlds together and presenting Chiropractic as a potentially vital part of infant and paediatric neurodevelopment.

### *Language*

Within this picture, speech and language delay is among the most prevalent developmental concerns in early childhood. Current estimates show that prior to Covid-19, speech delay in preschool children sat at an average of 9%. Bartlett and Franklin (2023) found that children who turned two between September 2000 and March 2023 were more likely to be diagnosed with speech delay, which now sat at an average prevalence of 16.9%.

Delays in expressive and receptive language acquisition carry consequences that extend well beyond communication, with longitudinal research linking early speech delay to later difficulties in literacy, academic achievement, social competence, and mental health. (Johnson et al, 2010) While speech-language pathology remains the primary intervention pathway for these children, a growing body of clinical literature suggests that speech and language development is not an isolated function but rather one that emerges from, and depends upon, the broader maturation of the nervous system. For a subgroup of children, the persistence of early neuromotor patterns, specifically, the retention of primitive reflexes, may represent an under-appreciated contributor to developmental delay across multiple domains, including language.

### *Primitive reflexes*

Primitive reflexes are involuntary, stereotyped movement responses mediated at the level of the brainstem and spinal cord. They emerge during foetal development and are present at birth as essential survival mechanisms, governing the infant's ability to feed, breathe, orient toward stimulation, and respond to threat. (Modrell and Tadi, 2023) Under typical developmental conditions, these reflexes are progressively inhibited and integrated within the first twelve months of life as higher cortical structures mature and assume functional dominance. This process of integration is not merely the suppression of reflex activity; it is understood to represent the active development of cortical inhibitory circuits that underpin voluntary movement, postural stability, sensory processing, and cognitive function. When this integration fails to proceed normally, whether due to birth trauma, intrauterine stress, illness, or suboptimal neurological development, the reflexes persist beyond the expected window, a phenomenon referred to as retained or aberrant primitive reflexes.

Retained primitive reflexes have been associated with a wide spectrum of developmental, postural, and behavioural difficulties. Persistently active reflexes create competing neurological demands that interfere with voluntary motor control, balance, and coordination, as the nervous system must simultaneously manage both reflex-driven and intentional movement. (Goddard-Blythe, 2022) Clinically, retained reflexes have been linked to poor postural tone, vestibular dysfunction, difficulties with fine and gross motor skills, sensory hypersensitivity, poor impulse control, emotional dysregulation, and attention difficulties. The ongoing neurological 'noise' generated by unintegrated reflexes is thought to place increased demands on the central nervous system, reducing the available cognitive and regulatory resources for higher-order tasks, including language acquisition, social learning, and emotional self-regulation. (Martello, 2023)

Furthermore, the neurological burden imposed by retained reflexes broadly, through its impact on sensory integration, attention, and arousal regulation, may indirectly compromise the child's capacity to engage with and benefit from language-rich environments. The speech pathologist's observation that a child with delayed language also presents with postural markers of reflex retention is therefore clinically significant, and represents an important intersection between disciplines.

### *Subluxation-based care*

How subluxations and subluxation-based care may impact the neurological systems that feed into reflex integration, neurodevelopment, speech delay and other issues remains largely theoretical, though larger scale clinical evidence is emerging. For parents, it is important to note that subluxation is not limited to the adult population. In the paediatric context, subluxations may arise from the mechanical forces of labour and delivery, including the use of obstetric interventions such as cervical ripening agents, artificial rupture of membranes, or instrumental delivery, as well as from the postural demands of early development and the cumulative strain of falls and motor learning.

The Chiropractic adjustment is proposed to restore normal segmental motion and afferent input, thereby supporting improved central nervous system processing. In the developing infant and toddler, this has implications not only for immediate physical function but for the neuroplastic processes underlying maturation, learning, and reflex integration.

This case report describes the presentation, assessment, management, and outcomes of a two-year-old male referred for Chiropractic care by a speech pathologist following a limited response

to speech therapy. The case is noteworthy in that it illustrates the role of Chiropractic care in supporting neurodevelopmental outcomes in a paediatric patient, and highlights the interdisciplinary collaboration in the assessment and management of developmental delay.

### Case details

A two-year-old male was presented for Chiropractic care at a paediatric-specific clinic on referral from a speech pathologist. At the time of presentation, the family was self-managing his speech development, and was not under the care of any other health professional. The primary concerns prompting his engagement with the speech pathologist and then the Chiropractor were delayed speech, low tone, general fussiness and unsettled moods, low resilience and general dysregulation.

The mother reported having an unremarkable pregnancy, which she termed 'good' while also noting significant occupational stress throughout the gestational period. Labour was induced using Cervadil tape, with a manual rupture of membranes performed the following day.

The patient was born at 40 weeks and six days gestation, arriving rapidly approximately ten minutes after rupture of membranes. Both mother and infant recovered well in the immediate postpartum period. Developmental milestones were described as largely on track, with the patient sleeping well, feeding well, and meeting gross motor benchmarks. However, the mother noted that he had always been characteristically 'whingey' and always wanted to be held, suggesting a baseline pattern of heightened regulatory demand from early infancy.

Prior to Chiropractic presentation, the patient had completed five to six sessions with a speech pathologist. During this time, some gradual progress in speech was observed; however, the speech pathologist identified postural and movement patterns that raised the possibility of retained primitive reflexes contributing to the patient's developmental difficulties. On the basis of this clinical observation, the family was directed to seek assessment at the Australian Children's Chiropractic Centre, where a comprehensive neurodevelopmental Chiropractic assessment was undertaken.

### Clinical findings

Upon presentation at the clinic a thorough history and examination was taken, during which a standardised paediatric Chiropractic protocol was used to assess cranial bone function, cervical and spinal range of motion, cranial nerve function, peripheral joint mobility, muscle strength and activation, neurological reflexes, primitive reflex testing, postural reflexes and tone assessment as well as gait analysis and postural photography.

Cranial bone function assessment identified restrictions at the left coronal suture, the squamous suture, the left parietal bone, and the right temporal bone. Cervical range of motion was restricted in flexion, left lateral flexion, and right rotation to a mild-to-moderate degree. Mid-thoracic range of motion was limited in extension and left lateral flexion, and the lumbar spine demonstrated restricted left lateral flexion. A pelvic extension restriction was also identified. Peripheral assessment noted reduced mobility at the left ankle. Cranial nerve testing revealed poor bilateral pupil constriction. Vertebral subluxations were identified at the left anterosuperior occiput, C1, T3-5, L4, and S2.

Muscle strength and activation testing demonstrated decreased postural tone in both flexion and extension. Deep tendon reflexes were diminished bilaterally at the patella and Achilles tendons, and on the right side at the biceps. These findings were consistent with an overall pattern of reduced neurological tone and diminished efferent output through the lower motor neuron pathways.

Primitive reflex testing revealed persistent expression of the rooting reflex, palmar grasp, tonic labyrinthine reflex (TLR), asymmetrical tonic neck reflex (ATNR; moderate on the left, mild on the right), Perez reflex, right Galant reflex, and plantar grasp. The symmetrical tonic neck reflex (STNR) was also persistently present on postural reflex assessment. The retention of these reflexes beyond the expected developmental window represented a central feature of the clinical picture, with implications for postural control, motor coordination, and neurological integration.

Gait assessment revealed a shortened right leg stance phase with associated hip rotation, and reduced right-sided shoulder abduction during the swing phase. Posture assessment, conducted using a combination of photographs and gait video footage given the patient's age and compliance limitations, identified a left shoulder elevation and left head tilt. These postural asymmetries were considered consistent with the subluxation pattern identified and the persistent primitive reflex profile.

## Management

Following assessment the patient was placed on a Chiropractic care plan with the immediate goal to support optimal nervous system function by addressing identified subluxations, thereby facilitating improved neurological firing, maturation, and integration. The long-term aims were to support progress in central postural tone, primitive reflex integration to age-appropriate levels, and improved gross motor function, gait, and balance. This was all in service of helping support this patient to function at his best, ultimately building a stronger brain and body connection, and support physical and neurological function.

The care plan was structured across three phases:

- an initial intensive phase of twice-weekly appointments for six weeks (inclusive of a formal clinical review and written review report in the final week)
- a consolidation phase of once-weekly visits for a further six weeks; and
- a maintenance phase of fortnightly appointments for six visits, again concluding with a clinical review and written report.

Chiropractic care was delivered using a multi-modal approach tailored to the patient's age, presentation, and tolerance. This included age-appropriate diversified manual adjusting, drop-piece technique, and activator-assisted adjustments to the identified subluxation levels. Cranial releasing techniques were applied to address the identified cranial bone restrictions. Soft tissue therapy was incorporated as clinically indicated. All techniques were applied with forces appropriate for a two-year-old paediatric patient.

A home exercise programme was prescribed to complement in-clinic care. This focused on three key areas: left-body stimulation to address the observed lateralised reflexes and

asymmetrical findings; proprioceptive joint distraction activities to support sensory integration and body awareness; and 'big brain stimulation' through gross motor play and large movement activities designed to support primitive reflex integration and cortical development.

## Outcomes

While the patient was checked prior to adjustments at every visit, formal clinical reassessments were conducted at defined intervals throughout the care plan using the same battery of measures applied at initial presentation. The clinic's health index, which aggregates findings across the assessment domains into a composite score out of 100, was used as a standardised tracking tool. At the initial presentation, the patient's health index score was 58. By the first formal review, this had improved to 78, and by the third review, the score had reached 82 which exceeded the target threshold of 80.

Significant improvements in primitive reflex integration, body awareness and control and postural tone were all noted, along with significantly decreased subluxation patterns. Postural strength and reflexes were now normal. All primitive reflexes had integrated with the exception of the Asymmetrical Tonic Neck Reflex. All muscle testing was now within appropriate limits. Cranial nerve testing was also returning to normal, symmetrical results. However, some light sensitivity remained, and left coronial suture restriction remained. Subluxation patterns had now significantly reduced, with improvements noted at the Right Anterosuperior occiput, T3, L4 and S1.

Notably, the patient's speech developed quickly, with the patient going from learning 1-2 new words per day to learning up to twenty new words per day. The mother described this as an 'explosion' in his speech. After twelve weeks, the patient remarked 'I'm so happy I can talk now'. His mother described being 'blown away' by the changes.

Alongside this, the parent observed substantial improvements in social engagement, including the development of peer friendships at daycare and in community settings, as well as meaningful development in imaginative play and improved gross motor skills including independent balance bike riding. Emotional regulation also improved markedly, with the patient demonstrating a greater capacity to identify and communicate his emotional state. He appeared to be generally more comfortable in his body, and better regulated in terms of mood, tone and in general.

## Discussion

Chiropractic care for a child is also care for the whole household. In this case, the patient is able to communicate now which has relieved a lot of daily frustrations and emotional outbursts impacting not only him but his family. He has an overall happier life at daycare and home. He has

better control over his body physically. Primitive reflexes have integrated which can help the patient to feel safer in his body and show less dysfunction. This can also help at school and with further learning and development.

Notably in this case, Chiropractic care was the only change to the patient's life at the time and therefore it's likely to have contributed by supporting neurodevelopment and co-regulation through subluxation-based care and recommended exercises.

This case demonstrates a clinically meaningful pattern of improvement in speech, neurodevelopment, postural tone, and emotional regulation following subluxation-based chiropractic care in a two-year-old male with persistent primitive reflexes and developmental delay. The trajectory of change, particularly the rapid acceleration in expressive language within the first weeks of care, is consistent with the hypothesis that resolution of neurological dysfunction may facilitate developmental processes that have been impeded by spinal and cranial subluxation.

The central theoretical framework underpinning this case is the relationship between vertebral subluxation, neurological function, and neurodevelopmental maturation. It is proposed that segmental dysfunction along the spine and cranium may create afferent interference that disrupts the normal maturation and integration of primitive reflex pathways.

The patient's response to care also highlights the potential value of interprofessional collaboration in the management of paediatric developmental delay. In this case, the referral from a speech pathologist who observed postural indicators of retained reflexes during the course of her own treatment plan was the direct pathway to chiropractic assessment. This interdisciplinary awareness enabled an expanded approach to the patient's care that the speech pathology intervention alone had not fully achieved.

Chiropractic care was the only change introduced to the patient's management at the time these improvements were observed, which supports its role as the most plausible contributing factor. However, it is important to acknowledge that this case represents a single patient, and that natural developmental maturation and the carry-over benefit of prior speech therapy cannot be entirely excluded as contributing influences.

Despite these limitations, the case adds to a growing body of literature suggesting that chiropractic care may play a meaningful role in supporting neurodevelopmental outcomes in paediatric patients with persistent primitive reflexes, low postural tone, and associated developmental and regulatory difficulties. The findings suggest that a Chiropractor's assessment of cranial, spinal, and neurological function may offer a complementary perspective in the multidisciplinary evaluation of children with developmental delay.

## Conclusion

This case report documents significant improvements in expressive language, primitive reflex integration, postural tone, emotional regulation, and overall developmental function in a two-year-old male following a course of subluxation-based chiropractic care.

The outcomes observed across serial clinical reassessments and parent reports suggest that addressing spinal and cranial subluxation may facilitate neurological maturation in paediatric patients with persistent primitive reflexes and associated developmental concerns.

Given the limitations inherent in single-case reporting, prospective cohort studies and randomised controlled designs are warranted to further investigate the efficacy of chiropractic care in this population.

Ruth Postlethwaite  
B BiomedSc  
Writer, ASRF

Clare McIvor  
B Bus(Admin),  
GD Comms(ProfWrit,Edit),  
GD(Psych)(Cand)  
Writer, ASRF

Jenna Godfrey  
BSc, M ClinChiro, ACCP  
Private practice of Chiropractic  
Newcastle  
Australia  
[hello@childrenschiropractic.com.au](mailto:hello@childrenschiropractic.com.au)

---

Cite: Godfrey J, Postlethwaite R, McIvor C. Improvement in Speech, Primitive Reflex Integration and Neurodevelopmental Dysregulation in a two-year-old male under Chiropractic care: A Chiropractic paediatric case report. *Asia-Pac Chiropr J.* 2026;7.1. <https://www.apcj.site/GodfreySpeech.pdf>

## Bibliography

Bartelt K, Gracianette M, Deckert J, et al Childhood Speech Development Delays Increasing Since the Start of the Pandemic. *Epic Research.* <https://epicresearch.org/articles/childhood-speech-development-delays-increasing-since-the-start-of-the-pandemic>. Accessed on May 29, 2026

Doyle M. (2021). Improvements in developmental delay in a female child following chiropractic care: a case report and selective review of the literature. *Journal of Clinical Chiropractic Pediatrics.* Vol. 20. Iss 2. <https://jccponline.com/doyle20-02.pdf>

Fairest C, Russell D. (2019), "Improvement in behavior and attention in a 7-year-old girl with ADHD receiving chiropractic care: a case report and review of the literature," *Journal Clinical Chiropractic Pediatrics*, Volume 18, No 1. <http://jccponline.com/ADHD.pdf>

Goddard Blythe S, Duncombe R, Preedy P. et al. (2022). Neuromotor readiness for school: the primitive reflex status of young children at the start and end of their first year at school in the United Kingdom. *Education 3-13*, 50(5), 654–67. <https://doi.org/10.1080/03004279.2021.1895276>

Haavik-Taylor H, Murphy B. Cervical spine manipulation alters sensorimotor integration: A somatosensory evoked potential study. *Clin Neurophysiol.* 2007;118(2):391-402. DOI 10.1016/j.clinph.2006.09.014

Haavik H, Niazi IK, Amjad I, et al. Neuroplastic Responses to Chiropractic Care: Broad Impacts on Pain, Mood, Sleep, and Quality of Life. *Brain Sci.* 2024, 14, 1124.

Hock S, Spoelstra A. Improved Brain Development in 37 Children Undergoing Chiropractic Care for Correction of Vertebral Subluxation: A Retrospective Analysis of Health Outcomes. *J. Pediatric, Maternal & Family Health.* 2022;86-94.

Johnson CJ, Beitchman JH, Brownlie EB. (2010). Twenty-year follow-up of children with and without speech-language impairments: Family, educational, occupational, and quality of life outcomes. *American Journal of Speech-Language Pathology*, 19(1), 51–65. [https://doi.org/10.1044/1058-0360\(2009/08-0083\)](https://doi.org/10.1044/1058-0360(2009/08-0083))

Law J, Boyle J, Harris F, et al. (2000). Prevalence and natural history of primary speech and language delay: findings from a systematic review of the literature. *Int J Lang Commun Disord.* Apr-Jun;35(2):165-88. DOI 10.1080/136828200247133.

Martello J. (2023). Persistent Primitive Reflex and Developmental Delay in the School-Aged Child. *The Journal For Nurse Practitioners.* Vol. 19. Iss. 10. November 2023 DOI <https://doi.org/10.1016/j.nurpra.2023.104767>

Modrell AK, Tadi P. Primitive Reflexes. [Updated 2023 Mar 6]. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK554606/>

Shaw KA, Williams S, Patrick ME, et al. Prevalence and Early Identification of Autism Spectrum Disorder Among Children Aged 4 and 8 Years — Autism and Developmental Disabilities Monitoring Network, 16 Sites, United States, 2022. *MMWR Surveill Summ* 2025;74(No. SS-2):1–22. DOI: <http://dx.doi.org/10.15585/mmwr.ss7402a1>

Steinberg B, Postlethwaite R, McIvor C. Improvement in Physical Resilience and Management of ADHD in a 12-year-old Male under Chiropractic Care: A case report. *Asia-Pac Chiropr J.* 2022;2.6. [apcj.net/papers-issue-2-6/#SteinbergResilience](http://apcj.net/papers-issue-2-6/#SteinbergResilience)

### *About the Case Report project*

This Case Report is a part of the [ASRF Case Report Project](#), a project designed to gather client studies from chiropractors and transform them into much-needed case reports, focused on the effects of chiropractic care on clinical presentations highly relevant to chiropractic, such as stress, immunity and adaptability.

This valuable project is made possible by the generous fundraising and contributions of ASRF supporters.

