Asia-Pacific Chiropractic Journal

CLINICALEVIDENCE
Peer-reviewed Case Series

Dry nights via chiropractic care and or Spinal Galant reflex integration:

A case series of 6 school children with Nocturnal Enuresis

Johnson Shen-Fung Huang

Narrative: This case study report discusses 6 cases of bedwetting children who received Chiropractic care and or functional neurology therapy based on the Melillo Method™. These children are aged between 6 and 15. All cases had never had one dry night since birth and one common finding shared across these cases was that they all had the Spinal Galant reflex retained when presented in their initial clinical consultations. The Spinal Galant reflex is present at birth that helps to facilitate trunk movements as the neonate descends through the birth canal. (3) The reflex should be inhibited by higher cortical functions and disappear by 9 months of age. The Spinal Galant reflex is tested by stroking the skin along the side of the spine, if present, that would cause muscle contraction and lateral flexion of the trunk toward the side stimulated. (19)

The common causes of nocturnal enuresis in children include developmental delay, constipation, poor arousal sleep, small bladder capacity, and neural integrity of both micturition centre of brainstem and lumbosacral plexus. Conservative options for early intervention include pelvic floor exercise or bladder training, rewards for dry nights, and moisture alarm devices. For medical treatment, the first line medications for nocturnal enuresis are desmopressin, anticholinergics and tricyclic antidepressants.

The improvements of bedwetting behaviour in these 6 cases with Chiropractic and or Spinal Galant reflex integration provided the practitioners, parents, and children themselves with a novel direction to approach bedwetting. Chiropractic care was aiming to offer optimal neural integrity by removal of vertebral subluxations and nerve interference to promote bladder control. NeuroImpulse Protocol™ is the chiropractic technique employed for 4 of the cases in this case study series.

Melillo Method™ is a functional neurology approach based on brain stimulations that promote neuroplasticity to improve cerebral network and functions. It is commonly offered to children with neurodevelopmental delay. There is a strong emphasis on primitive reflex integrations. (16) There were 2 cases with severe neurodevelopmental conditions exhibiting nocturnal enuresis that received Melillo Method™ in this case study series.

Cases 1 & 2 received Chiropractic adjustments only; Cases 3 & 4 received Melillo Method™ functional neurology therapy involving brain stimulation modalities with an emphasis of primitive reflex integration that included Spinal Galant reflex but no Chiropractic adjustment; Cases 5 & 6 received Chiropractic adjustments and were given Spinal Galant integration home exercise.

Indexing Terms: Chiropractic; Melillo Method; Spinal Galant reflex; nocturnal enuresis; NeuroImpulse Protocol.

Introduction

Nocturnal Enuresis is repeated voiding of urine into bed or clothes at nighttime during sleep. It can be either involuntary or intentional. (2) According to Diagnostic and Statistical Manual of

Mental Disorders, 5th Edition (DSM-5) this behaviour must be clinically significant as manifested by either a frequency of twice a week for at least 3 consecutive months or the presence of clinically significant distress or impairment in social, academic, occupational or other important areas of functioning. The chronological age of nocturnal enuresis is at least 5 years of age and over or equivalent developmental level. It should also not be due to the direct physiological effect of a substance such as a diuretic, antipsychotic, selective serotonin re-uptake inhibitors or to incontinence uncured as a result of polyuria or during loss of consciousness or any other general medical condition.

> *...Signs & symptoms of the retained Spinal Galant reflex are fidgeting, bedwetting, poor concentration, poor short-term memory, and hip rotation to one side when walking ...'*

A systematic review and meta-analysis study across 39 countries showed overall pooled prevalence of nocturnal enuresis among children and adolescents was 7.2%. (1) This also affects about one in every five children in Australia according to the Australian Government Department of Health, Disability and Ageing. (9)

Persistent nocturnal enuresis can be very challenging for individual sufferers with leading psychological distress and sense of embarrassment, anxiety, guilt, panic and can have enormous impact on self-esteem, some may even extend to social behaviours where one may avoid sleepover invitations and travelling plans. Parents and caregivers may sustain stress and frustration as constant cleaning of bed linen every morning results in tension and stress between the parent-children relationship. Parents and caregivers deliberately waking their children to empty their bladder in the middle of night is a common practice for bedwetting. This may not be the most ideal solution as it does not address the core issue that affected individuals are not learning to realise the sense of bladder fullness that promotes wakefulness to empty the bladder at night instead.

Assessments & Therapeutic interventions

Two main methods of treatments were used in this case series. Those who received Chiropractic care were assessed and treated with the NeuroImpulse Protocol™. The NIP™ is a brain-based Chiropractic technique developed by NJ Davies DC. The key concept of NIP™ is that any aberrant sensory input, such as pain and or mechanical fault from joints and muscles, will result in dysafferentation to the central nervous system and, in turn, alter the motor output, resulting in subluxations. The NIP™ is characterised by its precision assessments to identify all subluxations, each with their own kinesiopathology (joint fixations associated with neuropathology), neuropathology (myotome, dermatome, deep tendon reflexes, sclerotome) and compensatory patterns (joint fixations without neuropathology). (6) Gentle tonal impulse adjustments applied to identified subluxations normalise the kinesiopathology, neuropathology and compensatory patterns. Another key characteristic of The NIP™ is that once a subluxation pattern is corrected it should stay in alignment and the subsequent subluxation pattern emerged would be a chronologically older pattern; and if a specific subluxation pattern has repetitively shown on visits, it could be a tendency developed due to either instability of supporting soft tissues or an existing neurological dysfunction with primitive reflexes being a common cause.

Those who received Melillo Method™ were assessed with a comprehensive neurodevelopmental examination including hemispheric checklist, vital signs, primitive reflexes, postural reflexes, vestibular-cerebellar assessment, ocular motor assessment and olfactory assessment. The Spinal Galant reflex is examined as part of the primitive reflex assessment where each reflex is graded from 0 to +4 based on the strength of the reflex displayed.

The treatment modalities included 24 brain-based therapy sessions over 12 weeks applying brain stimulation utilising modalities include photobiomodulation, dynamic balance training,

ocular motor training with co-activation of colour, auditory, olfactory and sensory-motor stimulation during the above-mentioned training protocols. The treatment program was also reinforced by an individually designed home exercise program to integrate primitive reflexes and maintain the intensity and frequency of brain stimulation daily.

Given constipation is one of the known common causes for nocturnal enuresis, all 6 cases were advised to be well hydrated with ample water intake during daytime and no water or any fluid after dinner. Children should have a toilet visit to empty their bladder before bedtime.

Cases 1 & 2

The Chiropractic adjustment and primitive reflex integration group

Case 1 is a 15-year-old boy whose chief complaint was bedwetting and had never had one dry night in the past. He also experienced lumbopelvic pain related to injury acquired from playing basketball. He received NIP™ adjustments throughout the course of treatment and was given Spinal Galant integration exercises as part of the home program. However, he did not comply with this home exercise prescribed. He had 4 dry nights during the first week after his first Chiropractic treatment and advanced to 6 dry nights weekly after his third visit. He was seen on a bi-weekly basis for the first 6 months where he had 1 wet night between 10 to 14 days; then monthly visits where he had 1 wet night between 3 and 4 weeks. He was completely dry after 1 year of treatments totalling 20 visits. He has Spinal Galant reflex retained bilaterally and both graded +2. There were common recurrent subluxation patterns throughout the course of his treatment: rotated sacrum, ilium, upper cervical and craniums. The NIP™ method had identified weak muscle groups involved that caused the instability of these recurrent subluxation patterns and seemingly took 6 months to reach stability and thus complete dryness achieved as clinical outcome. The Spinal Galant reflex is still present at +1 bilaterally at his last consultation where he had been dried for 2 months.

Case 2 is a 13-year-old boy whose chief complaint was bedwetting and had never had one dry night in the past. He also experienced heels and knees pain related to injury acquired from playing basketball. He received NIP™ adjustments throughout the course of treatment and was given Spinal Galant integration exercises as part of the home program. However, he too did not comply with this home exercise prescribed nor to suggest follow up clinic visits. He had 2 dry nights during the first week after his first Chiropractic treatment and was completely dry after fourth visits, which is five months after its commencement. He has Spinal Galant reflex retained bilaterally graded +2. The subluxation patterns included rotated sacrum, lower cervical, pelvic floor coccygeus muscle, right diaphragm, right 12th rib and right hypertonic quadratus lumborum muscle. No recurrent subluxation pattern shown indicating no instability issue. His Spinal Galant reflex was still retained and graded+1 at his last consultation where he was completely dry for 5 months.

Cases 3 & 4

The functional neurology and primitive integration group

Case 3 is an 8-year-old boy whose chief complaints are neurodevelopmental delay symptoms: emotional dysregulations, stimming, poor memory, sleep disturbance and bedwetting. His Spinal Galant reflex was retained bilaterally both graded at +3. He was identified as left hemispheric developmental delay and received Melillo Method™ treatment with 24-visit program over a 12-week period utilising photobiomodulation in targeting brain stem, right cerebellum, left sensory cortex, left motor cortex, left insular cortex and left prefrontal cortex. The treatment is co-activated with specific sensory stimulation:

- Colour therapy to have the subjects wear red lens glasses.

- Aroma therapy with scented essential oils drops on the left collar of the shirts.
- Auditory stimulation with beta frequency music played to the right ear.
- Rezzimax® turner, a hand-held vibration device strap to the right brachium with vibration frequency over 40 Hz.

This is reinforced by a daily home program comprising primitive reflexes integrations with Spinal Galant being emphasised for his bedwetting symptom. He complied with both in-clinic visits and home programs. He was completely dry by the 13th visit which is the 7th week after commencement of his program. His Spinal Galant reflex has reduced strength and graded +1 bilaterally at his reassessment after completion of his program.

Case 4 is a 6-year-old girl who has a formal diagnosis of level 3 autism and global developmental delay. She is nonverbal and exhibits neurodevelopmental delay symptoms: emotional dysregulation, social dysfunction, speech regression, picky eating, sleep issues and bedwetting. Her Spinal Galant reflex was retained bilaterally graded at +4. She was identified as a global developmental delay with signs and symptoms showing more delay from the left hemisphere. She received Melillo Method™ treatment with 24-visit program over a 12-week period utilising photobiomodulation in targeting brain stem, right cerebellum, left sensory cortex, left motor cortex, left Broca's area, left Wernicke's area, left insular cortex and left prefrontal cortex. The treatment is co-activated with specific sensory stimulation:

- Colour therapy to have the subjects wear red lens glasses.
- Aroma therapy with scented essential oils drops on the left collar of the shirts.
- Auditory stimulation with beta frequency music played to the right ear.
- Rezzimax® turner, a hand-held vibration device strap to the right brachium with vibration frequency over 40 Hz.

This is also reinforced by a daily home program comprising primitive reflexes integrations with Spinal Galant being emphasised for her bedwetting symptom. She complied with both in-clinic visits and home programs. She was completely dry by the 12th visit which is the 6th week after commencement of her program. Her Spinal Galant reflex has reduced strength significantly graded at +1 at her reassessment after completion of her program.

Cases 5 & 6

The Chiropractic adjustment and primitive integration group

Case 5 is an 8-year-old boy whose chief complaint was bedwetting and had never had one dry night in the past. He was also experiencing anxiety and nightmares from 2 years of age when he lost his baby brother. His biological parents were separated not long ago prior to his initial consultation. His birth was prolonged and heart was showing signs of cardiac distress at the time during labour. His Spinal Galant reflex was retained bilaterally graded +3. He received NIP™ adjustments throughout the course of treatment and was given Spinal Galant integration exercises as part of the home program. He complied with both in-clinic visits and home integration exercise. He had alternated dry nights during the first week after commencement of treatment and was completely dry after the third visit. His mother reported the resolution of the bedwetting issue had transformed her boy significantly with boosting self-esteem and confidence in every aspect. The subluxation patterns corrected were sacrum, L2, ilium, C6, pelvic floor coccygeus muscles and cranium. His Spinal Galant reflex was grade +2 at his last consultation.

Case 6 is a 6-year-old boy who is also the younger brother of case 5 with the same biological parents. His chief complaint was bedwetting and had never had one dry night in the past with no other accompanied symptoms at the time of initial consultation. His mother brought him in for treatment after his older brother's prompt result. His Spinal Galant reflex was retained bilaterally

and graded +3. He received NIP™ adjustments throughout the course of treatment and was given Spinal Galant integration exercises as part of the home program. He complied to both in-clinic visits and home integration exercise. He had 1 dry night during the first week after commencement of his treatment; 4 dry nights during the 2nd week after his 2nd visit and was completely dry after the third visit. The subluxation patterns addressed were sacrum, pelvic floor coccygeus muscles, right elevated first rib, T1 and C5. His Spinal Galant reflex was grade +1 at his last consultation.

Discussion

The physiology of micturition during sleep is related to the reduction of vasopressin resulting in an increase of urine production that exceeds bladder reservoir capacity leading to nocturnal polyuria. For the nocturnal enuresis episodes there is the failure to awaken prior to bladder emptying due to impaired arousal from sleep. (12) The factors involved may include the functions and maturity of hypothalamus with water retention and sleep-wake circadian mechanism; the bladder capacity and control; the interoception and maturity of the insular cortex; the functions and maturity of the brain stem; and their relationship with neural integrity.

Brain stem and Spinal Galant reflex

The Spinal Galant reflex is found to be retained in all 6 cases, although this is one of many primitive reflexes that is present in healthy newborn babies. However, it should be inhibited by age-appropriate time. Primitive reflexes are involuntary motor expressions that are housed within autonomic and cranial nuclei in the brain stem, that protect the newborn and facilitate development. Retained primitive reflexes indicate corticosubcortical neuronal network impairment or possibly neuronal developmental delay.

The discovery of the Spinal Galant was in 1917, Galant found that '*When the dorsal skin near and along the vertebral column is stroked, the infant forms an arch with his body; the concavity of the arch is directed toward the stimulated area, and by arching in the opposite direction the infant evades stimulus*', a response he named the Spinal Galant reflex. Emerging within the 20th week in utero, the Spinal Galant reflex is present at birth and inhibited by the 9th month of life. In the same year, Veraguth found this reflex to be present in some adults with lower abdomen somatovisceral distress. Spinal Galant reflex has been found in children with poor bladder control and is present in a large percentage of adults with irritable bowel syndrome. (8)

> Symptoms of the retained Spinal Galant reflex are fidgeting, bedwetting, poor concentration, poor short-term memory, and hip rotation to one side when walking. (5) Retained Spinal Galant reflex results in tactile hypersensitivity in the dorsolumbar region, in severe cases even clothing may provoke involuntary contraction of back musculature building myofascial tension and irritate lumbosacral plexus over time.

All 6 cases were given and instructed with Spinal Galant reflex integration exercise at home. There was direct stimulation by stroking the paraspinal muscles or snow angel exercise involving actively abducting and adducting upper and lower limbs simultaneously in supine position. Case 3, 4, 5 and 6 children complied with the integration home exercise and achieved dryness between

3 to 7 weeks of treatments. Cases 1 and 2 were non-compliant to Spinal Galant reflex integration exercise and took longer to achieve complete dryness at 5 months and 12 months.

The micturition centre located in the pons of the brainstem regulates the urinary behaviour and bladder control via the micturition reflex mechanism. This pontine micturition centre receives ascending signals from the bladder when it is full then sends descending signals back to the bladder that coordinate bladder contraction and sphincter relaxation. This is also influenced by the frontal and insular cortex for the appropriateness and timing of urination. The micturition function may be compromised by brain stem immaturity due to developmental delay and possible neural irritation such as upper cervical or cranial subluxations.

Hypothalamus: Water retention and Sleep behaviour

Hypothalamus regulates body water retention by releasing vasopressin, an antidiuretic hormone. This signals the kidney to reabsorb water and slows urine production at night time typically during sleep. Supraoptic and paraventricular nuclei of the hypothalamus are responsible for vasopressin production. Conversely, a lack of vasopressin would promote urine production and often lead to nocturnal polyuria. This is more common in geriatrics and neurodevelopmental populations. (21)

The hypothalamus along with basal forebrain also regulates the sleep-wake behaviour via circadian clock and release of adenosine that inhibits hypocretin and orexin which are wake-promoting neurons and then also excite the pre-optic nucleus that promotes sleepiness. It is common in children with developmental delay to sustain longer wakefulness which leads to build up of adenosine that result in lacking sleep arousal after falling asleep. (24) The combination of nocturnal polyuria, small bladder capacity and impaired sleep arousal causes nocturnal enuresis. (10) Cases 3 and 4 both were formally diagnosed with developmental delay and also sleep issues. All newborns start off with sympathetic dominance and settle back toward a parasympathetic tone as they mature. For developmental delayed children, they tend to exhibit high sympathetic tone and shorter sleep time. It is then believed that the long wake and short sleep pattern result in poor sleep arousal which contribute to nocturnal enuresis.

Insular cortex & Interoception

The insular cortex is responsible for interoception that contributes to the internal awareness of the body, this includes sensing the fullness of the urinary bladder and urge to urinate.

It has been suggested that children with nocturnal enuresis may have insula dysfunction, including reduced activation during response inhibition tasks and abnormal resting-state functional connectivity, which could impair their ability to wake in response to the sensation of a filled bladder. A functional and structural MRI study carried out by Zong comparing a control group of 33 healthy children and a group of 33 nocturnal enuretic children in examine the differences in insular resting-state functional connectivities. The result shows abnormal resting-state functional connectivity of the insula with the medial prefrontal cortex suggesting that disconnectivity of the salience network (SN)-default mode network (DMN) may be involved in the underlying pathophysiology of children with nocturnal enuresis. (25)

Another study has found that children with bed-wetting show reduced activation in the insula during tasks that require inhibiting a response, which may be related to a weaker ability to suppress the urge to urinate while sleeping. (22)

Cases 3 and 4 both received Melillo Method™ treatment involving photobiomodulation directing infra-red laser light to the left insular and prefrontal cortex to improve connectivity and activation of interoceptive awareness.

Role of Chiropractic adjustments

Cases 1, 2, 5 and 6 received Chiropractic adjustments as their primary care for their bedwetting challenges. NIP™ is used to identify and also correct vertebral and extra vertebral subluxations. The NIP™ Chiropractic adjustments help to eliminate kinesiopathology and neuropathology; this will promote healthier proprioceptive input, muscle stretch receptive input, reduced nerve irritation and dural tension that in turn allow proper motor expression. My typical observation was that all 4 child subjects had sacrum subluxations corrected. The next common pattern were pelvic floor coccygeus, upper cervical and cranial subluxations. The sacral subluxations can be linked to the pelvic splanchnic nerve (S2-4), a parasympathetic innervation of the urinary bladder that contracts its detrusor muscle and relaxing the urethral sphincter when urinating. The anterior rami of S4-5 that innervate the pelvic floor coccygeus muscle may also play a role in providing closure support of bladder and urethra.

The upper cervical and cranial subluxations may be linked to the neural integrity of myodural bridge complex formed by rectus capitis posterior minor muscle to the spinal dura mater. (7) The dural torsion created by the upper cervical and or cranial subluxations can irritate the neural integrity of the brain stem region including the pontine micturition centre. The combination of scrum and upper cervical or cranial subluxations may lead to dural tension and irritation to either end of the dural CSF system. The recurrent subluxation patterns may be part of the reason that case 1 took longer and many more visits to achieve stability and complete dryness.

Role of Functional neurology treatments

Case 3 and 4 children received functional neurology treatment based on Melillo Method™. The main strategy was to follow a bottom-up developmental trajectory that begins in the brain stem, followed by cerebellum, diencephalon (thalamus and hypothalamus), then sensory and motor cortices and eventually the prefrontal cortex.

The treatment plan aimed to promote neuroplasticity by building networks in the targeted brain areas, which showed delay development identified in their neurological assessments. The key treatment modality was photobiomodulation using 808 nm wavelength infrared laser stimulating brain stem, cerebellum, left parieto-temporal-occipital (PTO) association area, left insular cortex, left motor strip and left prefrontal cortex.

The laser therapy is co-activated by sensory stimulations: red coloured glasses for visual cortex; vibration for somatosensory cortex; olfaction for insular and gustatory cortex; music for auditory cortex, optokinetic reflex stims for frontal eye field in frontal lobe and reaction interactive games for prefrontal lobe. The program was also reinforced by an individually designed home exercise program to integrate primitive reflexes and maintain the intensity and frequency of brain stimulation daily.

Spinal Galant reflex integration exercises were particularly emphasised to target nocturnal enuresis. Both case 3 and 4 children and their caregivers had committed and complied with the in-clinic therapy sessions and home exercise program. It is believed that the consistent stimulation to the targeted brain stem, left insular cortex, and prefrontal cortex has contributed to the neuroplasticity and the maturity of the neural network and thus resolution of the nocturnal enuresis as one of the improved symptoms. Neither child received Chiropractic adjustment as part of their treatment.

Constipation and hydration

There have been many studies indicating there may be a link between constipation and nocturnal enuresis that the prevalence of constipation was high among children with nocturnal enuresis. (11, 14, 15) The hypothesis is that hard faecal mass in the rectum can put pressure and influence the capacity of the neighbouring urinary bladder. All 6 cases were instructed to be well

hydrated with ample water intake in the day time and no water or fluid after dinner. The compliance of each case may vary and is not known therefore the contribution of the hydration factor may be difficult to be weighted.

Conclusion

This case series presented a retrospective discussion of 6 nocturnal enuresis children who achieved complete dryness from Chiropractic care and or functional neurology treatments with emphasis of Spinal Galant reflex integration. 2 cases that received Chiropractic adjustments only, took longer to achieve dryness followed by 2 cases received functional neurology treatments including Spinal Galant reflex integration, and 2 cases that received both Chiropractic adjustments with Spinal Galant reflex integration, yielded the quickest result achieving dryness with least number of treatment visits.

This suggests Chiropractic care combined with Spinal Galant reflex integration is more effective compared to one treatment protocol stand alone. Further investigations and research are required to support this case study report and assist more children and families with bedwetting challenges.

Johnson Shen-Fung Huang
BAppSc(ClinSc), BChiroprSc, Cert(Paed Chiro), FIBFN-CND
Private practice of chiropractic & functional neurology
Daisy Hill, Qld, Australia
admin@neurofitbraincentre.com.au
https://neurofitbraincentre.com.au/

Cite: Huang JS-F. Dry nights via chiropractic care and or Spinal Galant reflex integration:A case series of 6 school children with Nocturnal Enuresis. Asia-Pac Chiropr J. 2026;6.3. www.apcj.net/papers-issue-6-3/#HuangEneuresisx6

Limitation

Our small sample size is a limitation of this study; we have a total of 6 children with nocturnal enuresis. Further structured studies need to be performed prospectively with larger numbers of nocturnal enuresis cases for validating the effectiveness of these therapeutic approaches. The grading of the Spinal Galant reflex may also have a probability of inter-practitioner reliability consideration in its measurements.

Acknowledgement

We gratefully acknowledge the help provided by the practitioners and management team from the Formosa Chiropractic and Neurofit Brain Centre, Eight Mile Plains, Australia. We also thank our participants and families in this case study report.

References

1. Adisu MA, Habtie TE, Munie MA, et al. (2025). Global prevalence of nocturnal enuresis and associated factors among children and adolescents: a systematic review and meta-analysis. Child and Adolescent Psychiatry and Mental Health, 19(1). doi:https://doi.org/10.1186/s13034-025-00880-x
2. American Psychiatric Association (2022). DSM-5 TM guidebook the essential companion to the diagnostic and statistical manual of mental disorders, fifth edition. fifth ed. Washington, DC American Psychiatric Publishing.
3. Bilbilaj S, Aranit G, Fatlinda S.(2017). Measuring Primitive Reflexes in Children with Learning Disorders. European Journal of Multidisciplinary Studies, 5(1), p.285. DOI 10.26417/ejms.v5i1.p285-298
4. Bower WF, Moore KH, Shepherd RB, et al. (1996). The epidemiology of childhood enuresis in Australia. BJU International, 78(4), pp.602–606. https://doi.org/10.1046/j.1464-410x.1996.13618.x .
5. Brown M, Revels B, Smith S, et al. (n.d.). Correlative Study of Uninhibited Primitive Reflexes in Adult ADD/ADHD.
6. Davies NJ. (2024). NIP – Home. [online] Neuroimpulse.net. Available at: https://neuroimpulse.net/
7. Enix D, Scali F, Pontell M. (2014). The cervical myodural bridge, a review of literature and clinical implications.
8. Goddard (n.d.). Reflexes, Learning and Behavior, Window Into The Child's Mind.
9. Health. (2019). Bedwetting in childhood. [online] Australian Government Department of Health, Disability and Ageing. Available at: https://www.health.gov.au/resources/publications/bedwetting-in-childhood?language=en
10. Hiromitsu Negoro, Akihiro Kanematsu, Yoshimura K, et al. (2013). Chronobiology of Micturition: Putative Role of the Circadian Clock. The Journal of Urology, 190(3), pp.843–849. DOI: 10.1016/j.juro.2013.02.024.
11. Hsiao Y-C, Wang J-H, Chang C-L, et al. (2020). Association between constipation and childhood nocturnal enuresis in Taiwan: a population-based matched case-control study. BMC Pediatrics, [online] 20(1). https://doi.org/10.1186/s12887-020-1939-z
12. Kamperis, K. (n.d.). Nocturnal enuresis in children: The role of arginine–vasopressin, Handbook of Clinical Neurology.
13. Kitta T, Mitsui T, Kanno Y, et al. (2015). Brain-bladder control network: The unsolved 21st century urological mystery. International Journal of Urology, 22(4), pp.342–348 :https://doi.org/10.1111/iju.12721
14. Loening-Baucke V. (2007). Prevalence rates for constipation and faecal and urinary incontinence. Archives of Disease in Childhood, 92(6), pp.486–9. https://doi.org/10.1136/adc.2006.098335
15. McGrath KH, Caldwell PH, Jones MP. (2007). The frequency of constipation in children with nocturnal enuresis: a comparison with parental reporting. Journal of Paediatrics and Child Health, 0(0), p.070916021853007-??? https://doi.org/10.1111/j.1440-1754.2007.01207.x
16. Melillo R. and Leisman G. (2004). Neurobehavioral disorders of childhood : an evolutionary perspective. New York: Kluwer Academic/Plenum Publishers.
17. Pavione Rodrigues Pereira R, Nascimento Fagundes S, Surry Lebl A, et al. (2016). Children with nocturnal enuresis have posture and balance disorders. Journal of Pediatric Urology, 12(4), pp.216.e1–216.e6. https://doi.org/10.1016/j.jpurol.2016.05.003
18. Rašić Canevska O. (2019). Persistence of primitive reflexes and associated problems in children. Годишен зборник на Филозофскиот факултет/The Annual of the Faculty of Philosophy in Skopje, 72, pp.513–522. https://doi.org/10.37510/godzbo1972513rc
19. Rey-Mota J, Colmena G. Athanasios Dalamitros M, et al. (2024). Effectiveness of a single functional neurology intervention on primitive reflex integration dysfunction on children. Authorea (Authorea). https://doi.org/10.22541/au.173159494.45805686/v1
20. Roy HA., Green AL. (2019). The Central Autonomic Network and Regulation of Bladder Function. Frontiers in Neuroscience, 13. https://doi.org/10.3389/fnins.2019.00535
21. Tyagi S, Resnick NM, Clarkson B, et al. (2023). Impact of Sleep on Chronobiology of Micturition among Healthy Older Adults. American Journal of Physiology-renal Physiology, 325(4), pp.F407–F417. https://doi.org/10.1152/ajprenal.00025.2023
22. Wang M, Zhan, K. Zhang J, et al. (2015). Abnormal Neural Responses to Emotional Stimuli but Not Go/NoGo and Stroop Tasks in Adults with a History of Childhood Nocturnal Enuresis. PLOS ONE, 10(11), p.e0142957. https://doi.org/10.1371/journal.pone.0142957
23. Wright A. (n.d.). Childhood enuresis . Paediatrics and Child Health, Volume 26,(Issue 8).

24. Yamao Y, Koyama Y, Kawauchi A, et al (2000). Are micturition systems influenced by sleep-arousal system? Psychiatry and Clinical Neurosciences, 54(3), pp.259–261. https://doi.org/10.1046/j.1440-1819.2000.00669.x

25. Zhong ., Shen J, Wang M, et al. (2022). Altered resting-state functional connectivity of insula in children with primary nocturnal enuresis. Frontiers in Neuroscience, [online] 16. https://doi.org/10.3389/fnins.2022.913489