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**To cite this article:** Kenneth A. Olson, Derek Clewley, Nikki Milne, Jean-Michel Brismée, Jan Pool, Annalie Basson, Jenifer L. Dice & Anita R. Gross (2024) Spinal manipulation and mobilisation for paediatric conditions: time to stop the madness, *Journal of Manual & Manipulative Therapy*, 32:3, 207-210, DOI: [10.1080/10669817.2024.2344266](https://doi.org/10.1080/10669817.2024.2344266)

**To link to this article:** <https://doi.org/10.1080/10669817.2024.2344266>



Published online: 28 Jun 2024.



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## Spinal manipulation and mobilisation for paediatric conditions: time to stop the madness

An international taskforce of clinician-scientist physiotherapists with expertise in spinal manipulation and mobilisation, paediatric rehabilitation, and research design were recruited to develop an evidence-based position statement on the benefits and harms of spinal manipulation and mobilisation treatment in paediatric populations (<18 years) by the World Physiotherapy specialty groups; the International Federation of Orthopaedic Manipulative Physical therapists (IFOMPT) and the International Organisation of Physiotherapists in Paediatrics (IOPTP). This taskforce, formed in February 2020, was in response to controversy on the safety and efficacy of spinal manipulation in paediatric populations [1,2]. An independent expert review by Safer Care Victoria in 2019 identified foundational evidence to recommend to the Council of Australian Governments prohibition of spinal manipulation for general wellness or to manage non-musculoskeletal conditions in children under 12 years of age [1,2]. Up to this point, the international physiotherapy community had not come forward with a position statement on the use of spinal manipulation and mobilisation for paediatric populations. In this special issue of the Journal of Manual and Manipulative Therapy (JMMT), the taskforce has developed a position paper and supporting evidence-based papers to systematically synthesize the research evidence and clinical expert opinion resulting in seven actionable evidence-based practice position statements on the appropriateness of using spinal manipulation and mobilisation in paediatric populations. The taskforce completed a systematic scoping review, two systematic clinometric reviews, a Delphi survey of an international physiotherapy expert panel, and a position paper [3–8]. Clinical messages supported by this body of work and stated in the position paper in this special issue have one overarching point – ‘spinal manipulation and mobilisation are not appropriate and should not be performed on infants (<2 years of age) or to treat *non-musculoskeletal* paediatric conditions’ [6,8].

Theories such as Kinetic Imbalance due to Suboccipital Strain (KISS) have been developed over time to justify the use of spinal manipulation and mobilisation in infants and young children for the treatment of *non-musculoskeletal* conditions such as infantile colic, asthma, autism spectrum disorder, otitis media, and attention deficit hyperactivity disorder [9–13]. The KISS

theory is based on the premise that craniovertebral malalignments and upper cervical mobility fixations occur from trauma associated with birth that creates a cascade of maladaptive physiological responses leading to various *non-musculoskeletal* conditions [9,10,12]. The proposed treatment for KISS is spinal manipulation and/or mobilisation directed to the upper cervical spine intended to correct craniovertebral malalignments/fixations to theoretically reverse the proposed maladaptive physiological response [9,10,12]. The validity of this construct and similar theories has been challenged [11,12] due to a lack of biological plausibility and research evidence [14]. The task force findings confirm that evidence is lacking to support the use of spinal manipulation and mobilisation for infants and for paediatric *non-musculoskeletal* conditions [3,11,12]. Contrary to the expert review by Safer Care Victoria and the IFOMPT/IOPTP taskforce reviews and position statements, an alternative and opposing perspective was recently reached by a Delphi panel representing the chiropractic profession [15]. They assessed the paucity of high-level research evidence and yet made recommendations for best chiropractic practice to include chiropractic manipulation for paediatric *non-musculoskeletal* developmental conditions with the rationale that ‘the absence of research evidence does not equate to evidence of absence and subsequent denial of care’ [15]. We do not agree with this chiropractic perspective due to the lack of biological plausibility, paucity of research evidence, and documented evidence of harms and adverse events in infants and young children [3,11]. The relative risk rates of harms are unclear yet present and must be respected in determining the best clinical treatment pathway.

The use of manipulation and mobilisation interventions can cause mild to severe adverse events, especially in infants and young children [3,11]. Harms can be both direct; associated with the provision of the spinal manipulation and mobilisation interventions, or indirect; if the provision of spinal manipulation and mobilisation is associated with *delay* in diagnosis or more appropriate treatment. Indirect harm is not easily addressed in the literature. Delaying or denying other, more appropriate interventions or diagnostics for *non-musculoskeletal* conditions in infants and young children is an unfavorable event and an important consideration in the harm/benefit analysis of paediatric spinal manipulation and mobilisation [16]. Manual

therapy practitioners provide a disservice to their patients, profession, and society when they perpetuate unfounded theories that lack sound biomechanical and neurophysiological plausibility, especially when these interventions have the potential for harm.

Harm can also be caused by delayed or missed diagnosis of serious underlying spinal pathology. This issue of *JMMT* includes case reports that illustrate the complexity of paediatric spinal conditions, associated risk of harm, and the clinical reasoning physiotherapists use to identify serious underlying pathologies [17,18]. Clinical reasoning must include proper screening of conditions such as paediatric tumors, fractures, or infections before considering the use of spinal manipulation and mobilisation.

Spinal pain is common for those under the age of 18 years. For example, prevalence rates of 18 to 24% have been reported for weekly neck and back pain and monthly reports of musculoskeletal spinal pain are as high as 40% for children and adolescents aged 8 to 18 years [19]. The prevalence rates of *musculoskeletal* spinal pain in children and adolescents are similar to adult rates and can be a precursor to developing adult persistent neck and back pain [19–21]. Spinal manipulation and mobilisation may provide part of the answer for this clinical challenge, especially if combined with therapeutic exercise and education as part of a comprehensive biopsychosocial management approach. A new clinical decision tool to assist physiotherapists with joint mobilisation application for the paediatric population is also presented in this special issue to further facilitate the development of clinical reasoning for the integration of joint mobilisation in the plan of care for *musculoskeletal* paediatric conditions [22]. This tool may be a starting point to assist physiotherapists in overcoming barriers for the safe application of spinal mobilisation identified by Dice et. al. in a publication included in this special issue [7].

The task force on paediatric spinal manipulation advocates that spinal manipulation and mobilisation may be appropriate for older children and adolescents (8 to 18 years) to treat certain *musculoskeletal* spinal impairments at specific spinal levels using an impairment-based clinical reasoning model [8]. The biomechanical and neurophysiological plausibility of spinal manipulation and mobilisation are well established in the literature for treating adult *musculoskeletal* spinal impairments [23]. However, there is a dearth of research on the management of paediatric spinal conditions, especially related to spinal manipulation and mobilisation [2,3]. The task force recognizes this lack of evidence and strongly advocates for resources to be directed toward developing and researching clinical pathways for the appropriate and safe application of spinal manipulation and mobilisation for *musculoskeletal* spinal impairments and pain in children and adolescents. Resources should not be directed

toward the use of spinal manipulation and mobilisation to treat infants or *non-musculoskeletal* paediatric conditions (0–18 years).

An additional and important driver in utilisation of spinal manipulation and mobilisation for paediatric conditions is the opinion and emotions of the parents when seeking help and care for their child [24]. We know that these factors may overrule professional norms, best practice, and the evidence [24]. The development of evidence-based knowledge translation tools is needed to support family-centered evidence-based decision-making to determine the best clinical treatment pathway during shared decision-making processes.

It is time to stop the madness of attempting to treat infants and *non-musculoskeletal* paediatric conditions with spinal manipulation and mobilisation. Instead, resources should be directed toward the development of responsive clinical outcome assessments along with quality clinical trials to support evidence-based physiotherapy clinical pathways to effectively treat children and adolescents with *musculoskeletal* spinal impairments and pain.

## Disclosure statement

Kenneth A. Olson has published a textbook on spinal manipulation and mobilisation and conducts educational seminars on the use of an orthopedic manual physiotherapy approach for spinal conditions. Derek Clewley is a board member and the conference chair for the American Academy of Manual Physical Therapy (AAOMPT). Nikki Milne is the Secretary of the International Organisation of Physiotherapists in Paediatrics (IOPTP) and teaches paediatric physiotherapy courses. Jean-Michel Brismée teaches orthopedic manual therapy related continuing education courses with the International Academy of Orthopaedic Medicine (IAOM-US). Jan Pool, Annalie Basson, Jenifer Dice, and Anita Gross affirm that they have no financial affiliation (including research funding) or involvement with any commercial organisation that has a direct financial interest in any matter included in this manuscript.

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