

Redefining Conservative Treatment: Comprehensive Rehabilitation for Children with Idiopathic Scoliosis

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Abstract. The term “conservative treatment” has long served as the standard designation for non-operative management in idiopathic scoliosis, yet its linguistic and conceptual adequacy has remained largely unexamined. This paper critically evaluates the utility of the term “conservative” in the medical and scoliosis-specific contexts. It explores whether “(re)habilitation” offers a more clinically accurate, patient-centred, and functionally descriptive substitute. We argue that this terminological shift better reflects the active, multidisciplinary, and demanding nature of non-operative scoliosis care, and carries concrete clinical implications for how treatment targets are defined and pursued.

Keywords. idiopathic scoliosis, conservative treatment, rehabilitation, habilitation, Scoliosis Specific Exercises, bracing, SOSORT, terminology

1. Introduction

The designation “conservative treatment” is widely used yet conceptually ambiguous in clinical medicine. Within scoliosis management, its adequacy has been a matter of ongoing institutional deliberation. The Scoliosis Research Society (SRS) progressively revised the nomenclature of its dedicated committee — from “conservative” to “non-operative,” and subsequently to “comprehensive care” — reflecting a growing recognition that the original term was insufficient. At its founding, the International Society on Scoliosis Orthopaedic and Rehabilitation Treatment (SOSORT) deliberately avoided this terminology, opting instead for “orthopaedic and rehabilitation treatment.” This paper argues that “conservative” may be effectively substituted, within idiopathic scoliosis management, by the term “(re)habilitation”—a construct that, as explained below, encompasses both rehabilitation and habilitation and better serves the field’s clinical, communicative, and therapeutic goals.

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2. “Conservative” in Medicine

In strictly biomedical usage, “conservative” denotes a philosophy that prioritises preserving the patient’s native anatomy and avoiding irreversible procedural risks. Healthcare professionals universally understand it and correctly imply a safety-first approach. These strengths are genuine. However, the term has limitations that may lead to misunderstandings between clinicians and patients. From the patient’s perspective, it may inadvertently signal passivity or insufficiency—an impression at odds with the reality of intensive non-operative regimens. Outside medicine, the word carries ideological connotations that can create unintended friction. For patients in significant pain, it may communicate a lack of clinical urgency, undermining therapeutic alliance even when non-operative management is the most evidence-based path. For these reasons, practitioners increasingly adopt alternatives such as non-operative management, rehabilitation, or functional restoration.

3. “Conservative” in Idiopathic Scoliosis

In idiopathic scoliosis, non-operative management encompasses a spectrum calibrated to curve severity and skeletal maturity: clinical observation, Scoliosis Specific Exercises (SSE), and orthotic management (bracing) [1]. The term “conservative” is technically accurate here — it seeks to conserve the spine’s natural state and avoid the permanent consequences of spinal fusion. Yet it is functionally inadequate. Wearing a rigid thoracolumbosacral orthosis for up to 23 hours daily, or adhering to years of SSE, is an intensive lifestyle intervention — anything but passive. The term risks conveying inaction to families, particularly when observation alone is indicated, creating a potentially damaging gap between the clinician’s goal of avoiding unnecessary treatment and the family’s expectation of active care. In short, “conservative” masks the substantial physical and psychological demands placed upon the patient throughout the treatment process.

4. Rehabilitation, Habilitation, or (Re)habilitation

4.1. *The Case for Rehabilitation*

The term rehabilitation has gained traction in the scoliosis community, most visibly through SOSORT’s foundational nomenclature. It reorients clinical discourse from spinal morphology toward patient function, positions the patient as an active agent, and is broad enough to encompass SSE, respiratory care, and psychological support. Moreover, orthoses (as well as prostheses) are within the broad range of rehabilitation interventions. For adolescent patients, its connotations of purposeful effort may be more motivating than “conservative management.” However, rehabilitation has conceptual limitations in this context. Conventionally, it denotes the restoration of a function lost following injury or surgery. Idiopathic scoliosis is not an injury to a previously intact system; it is a structural developmental deviation. The clinical objective is to redirect ongoing growth, not to restore a prior state.

Rehabilitation is also a term under scrutiny due to challenges in its use in health care [2,3]. Recently, following the PICO research framework (Population, Intervention, Comparison, Outcome), and using the World Health Organization International Classification of Functioning, Disability and Health terminology, rehabilitation has been defined by Cochrane Rehabilitation as a *multimodal, person-centered, collaborative process including interventions targeting a person's capacity (by addressing body structures, functions, and activities/participation) and/or contextual factors related to performance (Intervention) to optimise the functioning (Outcome) of persons with health conditions currently experiencing disability or likely to experience disability, or persons with disability (Population)* [4]. This definition highlights the challenges of considering the treatment of children with idiopathic scoliosis as rehabilitation:

- 1) *Population*: they could be considered persons with a health condition (idiopathic scoliosis) who are likely to experience disability (if scoliosis progresses to a level that could cause disability in adulthood).
- 2) *Outcome*: the target of optimising the functioning is for the future (adulthood), while treatments proposed during childhood, in fact, impair functioning.
- 3) *Intervention*: This is where the use of the term opens many perspectives, as we report below, stems from its being a multimodal, person-centred, collaborative process.

4.2. The Case for Habilitation

The more precise term, from a developmental standpoint, is habilitation — the acquisition or development of capacities not previously established [5]. Since the condition emerges during growth, affected patients are acquiring postural and neuromuscular competencies for the first time. Therapeutically, the aim is to guide the developing nervous system toward a corrected postural pattern, consonant with the principle of guided developmental habilitation. Moreover, bone growth must be modulated to achieve the best final shape. Finally, the progressive deformity and its treatment can impact the development of other functions, including respiratory, physical and psychological ones [1]. This framing is consistent with current understanding of proprioceptive maturation and the time-sensitive nature of treatment within the window of growth-related plasticity. Despite its technical superiority, “habilitation” lacks widespread recognition. Most patients had a straight spine in early childhood, making the treatment trajectory feel restorative to families and clinicians alike. The communication burden of explaining an unfamiliar term is not trivial.

4.3. Proposing (Re)habilitation

We therefore propose the composite term (re)habilitation, which pragmatically resolves this tension. The parenthetical prefix signals that rehabilitation is the familiar, widely understood container. At the same time, the brackets indicate that habilitation is the more formally correct concept, particularly for patients in active growth. This notation acknowledges both the clinical realities of the field and its developmental specificity, and is consistent with the institutional direction taken by SOSORT and recent advances in the field.

5. Clinical Implications

Adopting the term (re)habilitation is not merely a semantic exercise; it carries direct implications for how the field defines, delivers, and evaluates treatment. A (re)habilitation framework shifts the lens from the spine as an anatomical object to the patient as a developing person. This orientation opens the door to a substantially broader set of treatment targets.

The most recent work developed within the SOSORT community, applying the GUIDE-Rehab framework (a guideline for describing complex rehabilitation interventions) [6] to idiopathic scoliosis, identifies several key domains that a (re)habilitation approach must address. These go well beyond the mechanics of the brace or the biomechanics of SSE to include the following targets.

- **Three-dimensional spino-pelvic alignment** remains a primary morphological target, encompassing not only optimal correction but also its consolidation and long-term maintenance during and after skeletal growth.
- **Adherence** is recognised as a foundational condition for treatment success, requiring active strategies across education, motivation, and therapeutic alliance. Adherence is a shared responsibility that goes beyond mere compliance, that places the burden on the patient and not the treating team.
- **Trunk morphology (aesthetics)**, as the external, objective and quantifiable observable expression of the underlying deformity, is a distinct target with subsequent individual implications for body image and social participation.
- **Patient well-being**, including self-body image and self-aesthetic perception, constitutes a core domain: psychological impact, identity, confidence, and the risk of nocebo effects from clinical language are all active areas of intervention.
- **Physical function** — the patient’s capacity to engage in age-appropriate motor tasks, sports, and daily activities — must be explicitly supported, including through guidance on physical activity consistent with WHO recommendations.
- **Respiratory function**, particularly thoracic mobility and ventilatory capacity, is affected by curve progression or brace compression and requires targeted intervention when needed.

What unites these domains is the recognition that idiopathic scoliosis treatment is a complex intervention, in which the brace and SSE are ingredients within a broader plan, not ends in themselves. A (re)habilitation framework makes this complexity explicit, directing clinical attention to the whole patient at each stage of growth and across physical, psychological, and social dimensions. Replacing “conservative treatment” with “(re)habilitation” in clinical discourse, guidelines, and research would thus encourage the field to measure, report, and optimise this full spectrum of targets — ultimately delivering better, more equitable, and more patient-centred care.

6. Limitations

This paper proposes a terminological shift that, while conceptually grounded, faces real-world barriers that merit acknowledgement. The composite notation “(re)habilitation” is itself a novel construct, and its adoption across diverse healthcare systems, languages, and institutional cultures cannot be assumed. Established nomenclature carries significant inertia: billing codes, insurance frameworks, clinical guidelines, and research

databases are structured around existing terms, and any substitution risks administrative friction or indexing inconsistencies in the short term. Resistance may also arise from clinicians who regard the debate as semantic rather than substantive, or from health systems in which “rehabilitation” retains a strict post-surgical or post-injury administrative meaning, rendering its application to a developmental condition procedurally ambiguous. A further nuance concerns age and clinical stage: while “(re)habilitation” most accurately describes management during active skeletal growth, it does not conceptually fit adult patients with residual or progressive curves, in whom the restorative connotations of rehabilitation may be more appropriate. Finally, this paper is largely theoretical; it does not present empirical data on whether the proposed terminology is better understood, more motivating, or clinically more effective than existing alternatives. Prospective studies exploring patient and clinician responses to terminological framings would be needed to check the clinical benefits argued here.

7. Conclusions

The term “conservative treatment” is technically accurate in indicating non-surgical intent, but it systematically underrepresents the scope, intensity, and person-centred demands of contemporary idiopathic scoliosis care in children. “(Re)habilitation” emerges as a possibly improved alternative: it is functionally descriptive, communicatively accessible, developmentally informed, and broad enough to encompass the full range of treatment targets identified by current evidence. Its adoption would align the field with the institutional trajectory initiated by SOSORT and with the broader movement toward complex intervention science in rehabilitation medicine.

References

- [1] Negrini S, Donzelli S, Aulisa AG, Czaprowski D, Schreiber S, de Mauroy JC, Diers H, Grivas TB, Knott P, Kotwicki T, Lebel A, Marti C, Maruyama T, O’Brien J, Price N, Parent E, Rigo M, Romano M, Stikeleather L, Wynne J, Zaina F. 2016 SOSORT guidelines: orthopaedic and rehabilitation treatment of idiopathic scoliosis during growth. *Scoliosis Spinal Disord.* 2018 Jan 10;13:3. doi: 10.1186/s13013-017-0145-8.
- [2] Negrini S, Meyer T, Arienti C, Kiekens C, Pollock A, Selb M, Stucki G; 3rd Cochrane Rehabilitation Methodology Meeting participants. The 3rd Cochrane Rehabilitation Methodology Meeting: “Rehabilitation definition for scientific research purposes”. *Eur J Phys Rehabil Med.* 2020 Oct;56(5):658-660. doi: 10.23736/S1973-9087.20.06574-0. Epub 2020 Sep 16.
- [3] Negrini S, Levack WMM, Meyer T, Kiekens C. Why we need an internationally shared rehabilitation definition for clinical research purposes. *Clin Rehabil.* 2021 Dec;35(12):1657-1660. doi: 10.1177/026921552111043215. Epub 2021 Aug 31.
- [4] Negrini S, Selb M, Kiekens C, Todhunter-Brown A, Arienti C, Stucki G, Meyer T; 3rd Cochrane Rehabilitation Methodology Meeting participants. Rehabilitation definition for research purposes. A global stakeholders’ initiative by Cochrane Rehabilitation. *Eur J Phys Rehabil Med.* 2022 Jun;58(3):333-341. doi: 10.23736/S1973-9087.22.07509-8. Epub 2022 Mar 21.
- [5] European Physical and Rehabilitation Medicine Bodies Alliance. White Book on Physical and Rehabilitation Medicine (PRM) in Europe. Chapter 1. Definitions and concepts of PRM. *Eur J Phys Rehabil Med.* 2018 Apr;54(2):156-165. doi: 10.23736/S1973-9087.18.05144-4.
- [6] Negrini S, Arienti C, Armijo-Olivo S, Côté P, Heinemann AW, Kiekens C, Kumbhare D, Levack W, Meyer-Feil T, Whyte J; RCTTRACK Executive Committee; GUIDE-Rehab Advisory Committee; Rehabilitation Journals Chief Editors; PREPARE Project Clinical Partners. Reporting GUIDeline for Intervention DDescription in Rehabilitation (GUIDE-Rehab): a tool to open the ‘black box’ of rehabilitation complex interventions. *BMJ Evid Based Med.* 2025 Dec 21:bmjebm-2025-113997. doi: 10.1136/bmjebm-2025-113997. Epub ahead of print.