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FASCIA CONGRESS: CASE REPORT

# The effect of myofascial release (MFR) on an adult with idiopathic scoliosis

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## KEYWORDS

Myofascial release;  
Physical therapy;  
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Massage;  
Idiopathic scoliosis;  
Back pain

## Summary

**Background:** The lack of evidence of conservative treatment has led to an interest in exploring myofascial release (MFR) as an effective means of controlling spinal curvature progression in adolescents with idiopathic scoliosis.

**Objective:** The purpose of this case study is to measure the effects of MFR as a manual therapy technique in the treatment of idiopathic scoliosis.

**Methods:** One 18-year-old female subject underwent 6 weeks of MFR treatment consisting of two sessions each week for 60 min. Pain, pulmonary function, and quality of life were measured. Six goniometric measurements were taken encompassing trunk flexion, extension, and rotation.

**Results:** The subject improved with pain levels, trunk rotation, posture, quality of life, and pulmonary function.

**Conclusions:** The results suggest further investigation is needed using MFR, as an effective manual therapy treatment for idiopathic scoliosis.

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## Introduction

Research has shown that scoliosis can lead to an increased incidence of low back pain (LBP) espe-

cially in those with lower thoracolumbar curves (Kostuik and Bentivoglio, 1981; Ramirez et al., 1997).

Health-related quality-of-life issues such as physical/occupational function, pulmonary function (Hawes and Brooks, 2001), social function, as well as psychological and physiologic well-being,

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may also be affected as a result of a significant curve and poor posture (Asher and Burton, 2006). There is a lack of evidence that conservative treatment including bracing, observation, and physical therapy, specifically physical exercise and manual therapy techniques: reduces the spinal curvature, reduces the progression of the curvature, or delays surgery in people with idiopathic scoliosis (Maruyama et al., 2003; Negrini et al., 2006). This has led to an interest in exploring myofascial release (MFR) as an effective means of controlling spinal curvature progression in adults and adolescents with idiopathic scoliosis.

Research has indicated that when MFR is utilized as a therapeutic modality by a massage therapist, physical therapist, occupational therapist, or other health-care practitioner, adult patients see a decrease in pain, improved posture, and advancement in quality of life, which may include physical, social, and pulmonary function (Barnes, 1990; Davis, 2002; Fernandez de las Penas, 2005; Lukban, 2001). Therefore, the purpose of this case study is to measure the effects of MFR as a manual therapy technique in the treatment of idiopathic scoliosis.

## Background

Idiopathic scoliosis is classified as a patient having at least a 10° lateral curve of the spine for which a recognizable cause is unknown (Asher and Burton, 2006; Dutton, 2004).

Idiopathic scoliosis is considered in three age groups including infantile (0–3 years of age), juvenile (3–9 years of age), and adolescent (10–18 years of age).

The most common of all types of scoliosis is adolescent idiopathic and it is predominantly seen in girls at low curve magnitudes (Boachie-Adjei, 2002). The frontal plane deformity is the more obvious lateral curve.

An anterior curve in the sagittal plane (kyphosis) may also appear, perhaps due to prominent posterior rib angles on the convex side.

Rotational deformities can lead to abnormal or reduced respiratory function, which may in turn lead to serious respiratory impairments (Upadhyay et al., 1995).

Other impairments resulting from idiopathic scoliosis include pain and a decrease in the patient's quality of life.

Research has shown that scoliosis can lead to an increased incidence of LBP especially those with lower thoracolumbar curves (Nilsson and Lundgren,

1968; Koroivessis et al., 2007). Once skeletal maturity is reached, the patient is considered to have a diagnosis of adult idiopathic scoliosis (Pashman and Paquette, 2007). The distinction is important because while a patient with adult idiopathic scoliosis may still need treatment for progression; pain, which has been shown to increase with aging, is a much more common indication for treatment.

Treatment plans are patient-age dependent and depend on a variety of factors including the extent of the curve at the time of diagnosis, the patient's stage of bone growth, the amount of pain and deformity associated with the condition, and the patient's willingness and ability to withstand surgery should it be deemed necessary (Spine Universe, 2008).

The current treatments for scoliosis include non-operative bracing and surgery to stabilize the affected portion of the spine. However, current research has shown that bracing may cause some psychological stress to the patient at the initiation of treatment and possibly long term (Sapountzi-Krepia et al., 2001). Bracing may impact patient's self-perceptions and may increase feelings of being ashamed of their body. Also, psychological reasons and pain are associated with poor compliance in adolescents treated with a spinal orthosis (Koroivessis et al., 2007). These findings help support the need for more evidence using MFR as an effective treatment for scoliosis (Donnelly et al., 2004; Lenssinck et al., 2005).

## MFR

MFR is a therapeutic treatment that uses gentle pressure and stretching to facilitate the release of fascial restrictions caused by accidents, injury, stress, repetitive use, and traumatic or surgical scarring.

The fascial restrictions are palpated by the practitioner and the techniques are applied directly to the skin of the patient without lotions or oils. The pressure is applied into the direction of the restriction just until resistance is felt or the tissue is perceived to stop moving.

The pressure is sustained at this point of resistance, without sliding over the skin or forcing the tissue, for a minimum of 90–120 s. As the tissue begins to release, the practitioner maintains the same amount of pressure and follows the release three dimensionally through multiple releases.

The fascia is a connective tissue that forms a three-dimensional web, which surrounds and supports the muscular, skeletal, and visceral components of the body. Fascial restrictions can bind down and exert pressure and stress on the body and its soft tissue structures, causing pain and dysfunction.

Superficial fascia is found in the subcutis in most regions of the body, blending with the reticular layer of the dermis (Skandalakis et al., 2002). It is comprised mainly of loose areolar connective tissue and adipose, and is the layer that primarily determines the shape of a body.

In addition, this type of fascia surrounds organs and glands, neurovascular bundles, and is found at many other locations where it fills otherwise unoccupied space. It serves as a storage medium of fat and water and as a passageway for lymph, nerve and blood vessels (Hedley, 2005).

Deep fascia is the dense fibrous connective tissue that penetrates and surrounds the muscles, bones, nerves and blood vessels of the body. The high density of collagen fibers is what gives the deep fascia its strength and integrity. The amount of elastin fibers determines how much extensibility and resiliency it will have. Injuries, stress, inflammation, trauma, and poor posture can cause restriction to fascia. The goal of MFR is to release fascial restriction and restore its tissue health.

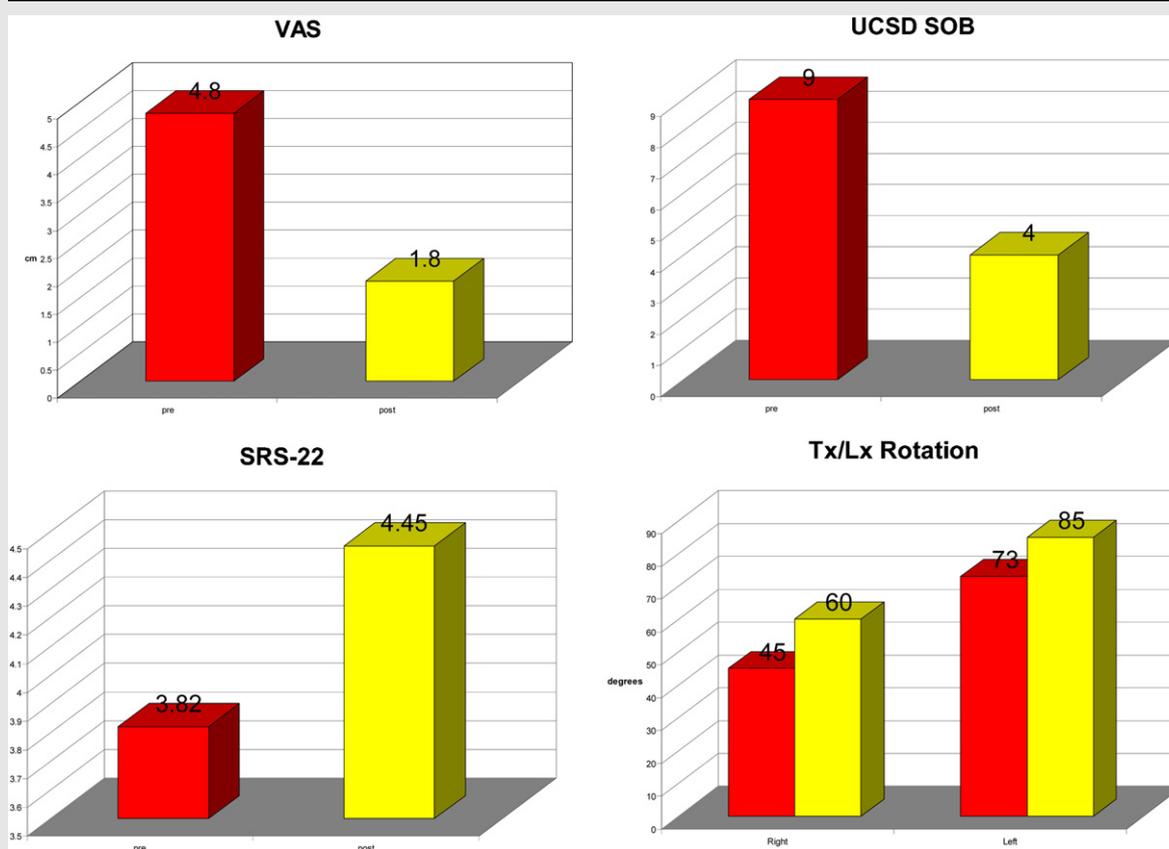
**Table 1** ROM goniometry

	Pre	Post
<i>Thoracic/lumbar</i>		
Extension (cm)	5	5
Flexion (cm)	12.5	13.75
Right rotation (deg)	45	60
Left rotation (deg)	73	85
Right lateral flexion (deg)	35	39
Left lateral flexion (deg)	38	43
Lumbar flexion (cm)	7.5	7.5
Lumbar extension (cm)	3.75	3.75

### Case description

An 18-year-old female with a Double Major curve and a Cobb angle of 45° who complains of LBP,

**Table 2**



VAS: Visual Analog Scale.

UCSD SOB: University of California San Diego Shortness of Breath Questionnaire.

SRS-22: Scoliosis Research Society Quality of Life Questionnaire.

TX/Lx rotation: combined thoracic and lumbar rotation.

bilateral hip pain, and a decreased self-image. The subject had been previously treated as a 12-year old for her scoliosis with a Boston Brace from approximately the fall 2000 through the spring of 2001. Interestingly, the subject reported that she did not have pain associated with her scoliosis prior to bracing. The subject reported receiving an endoscopic exploration and debridement in her left hip but was unable to recall the specifics of the procedure. The subject was referred for follow up treatments with a physical therapist. At the time of the study, the subject was being medically observed for progression of her curve with radiographs every 2 years.

## Methods

Before the initial treatment, the subject was asked to sign an informed consent form. At baseline, observations of posture and gait were made to

determine any deviations. Initially four pictures, one each in the left and right sagittal and anterior and posterior coronal planes, were taken of the subject with the use of grid photography and a Polaroid camera. Follow-up pictures were taken every 2 weeks, with the final set of photographs taken during the closing exit interview. In addition, the subject's gait mechanics were analyzed and noted.

The subject completed three pre-tests and post-tests before and after completing 6 weeks of MFR treatment consisting of two sessions each week for 60 min. This dosage of MFR was chosen because it is a customary length of treatment time and duration before a reassessment for a massage therapy plan of care in the providing practitioner's massage therapy practice. Pain was measured using the Visual Analog Scale (VAS) before each treatment session.

The subject was instructed to complete the University of California at San Diego Shortness of Breath questionnaire (UCSD SOB) to assess



Figure 1 (A) Anterior/posterior standing X-ray June 2005. (B) Anterior/posterior supine X-ray June 2005.

self-reported pulmonary function (Eakin et al., 1998; Ries, 2005).

The Scoliosis Research Society-22 (SRS-22) quality-of-life questionnaire was also completed during the initial visit and the exit interview to help examine factors such as, general health perception, physical functioning, emotional functioning, self-esteem and aesthetics, vitality, school activity, bodily pain, and social functioning (Birdwell et al., 2005; Lai et al., 2006).

In order to accurately assess flexibility, a total of six goniometric pre- and post-test measurements were taken encompassing trunk flexion, extension, and rotation.

Following the initial data collection visit, the patient began 6 weeks of MFR performed by a licensed massage and bodywork therapist at LeBauer Structural Bodywork in Greensboro, NC. The therapist used MFR techniques, as taught by John Barnes and the MFR Treatment Centers and

Seminars. These techniques are characterized by sustained gentle pressure of a minimum duration of 90–120 s. The patient received 45 min of hands on treatment, two times per week, for 6 weeks.

Feedback was obtained from the subject at the conclusion of the study. Reassessment of posture and gait, current pain measurements using the VAS, and the SRS-22 were evaluated along with the subject's overall impression of treatment. Following data collection and interpretation, the investigators shared the results of the study with the subject and conducted an exit interview for comparison of MFR treatment to previous treatment experiences.

### Summary of a typical MFR treatment session

*Supine:* Bilateral lower extremity traction 5 min; diaphragm release 5 min; bilateral sustained pressure

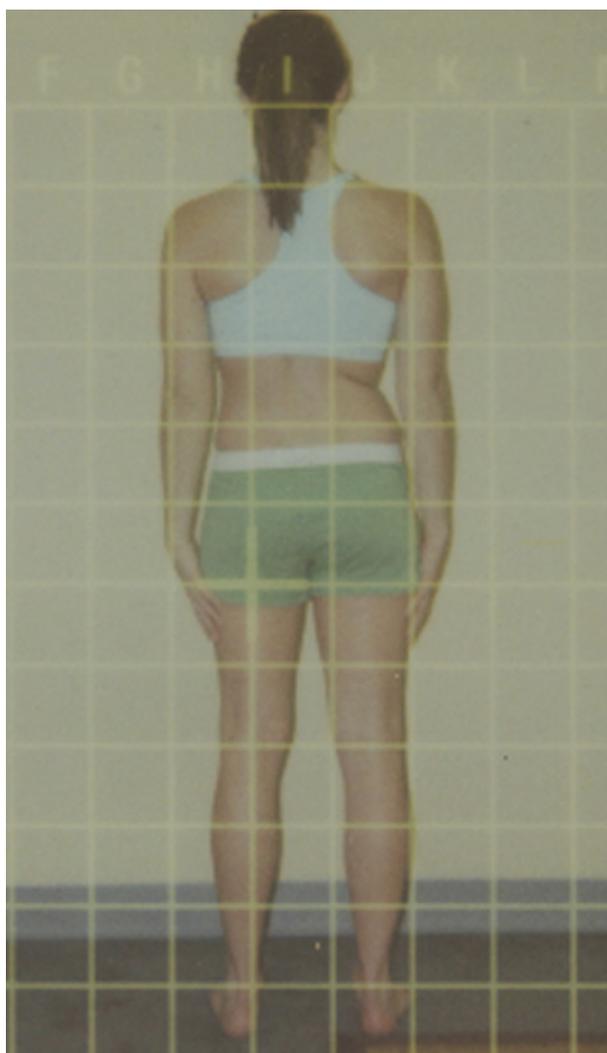


Figure 2 10/21/06 week 1 standing posture polaroid.

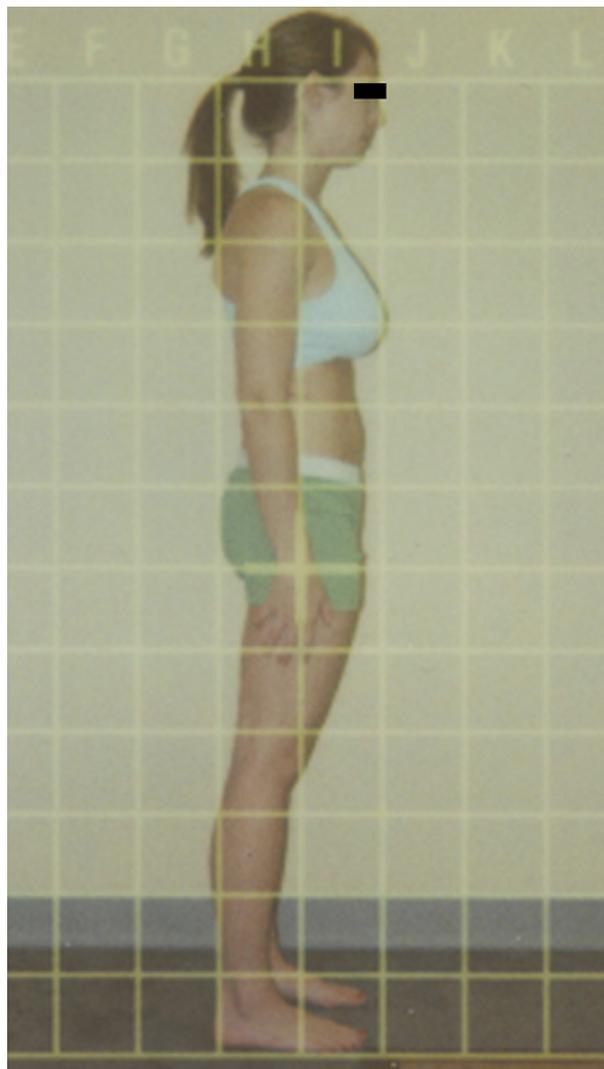


Figure 3 10/21/06 week 1 standing posture polaroid.

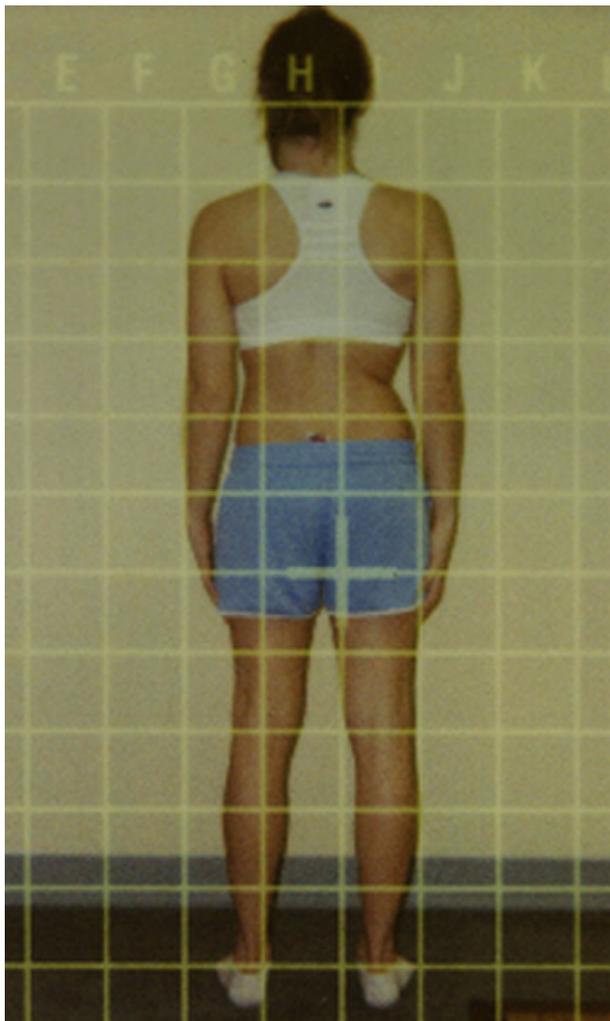


Figure 4 11/26/06 week 6 standing posture polaroid.

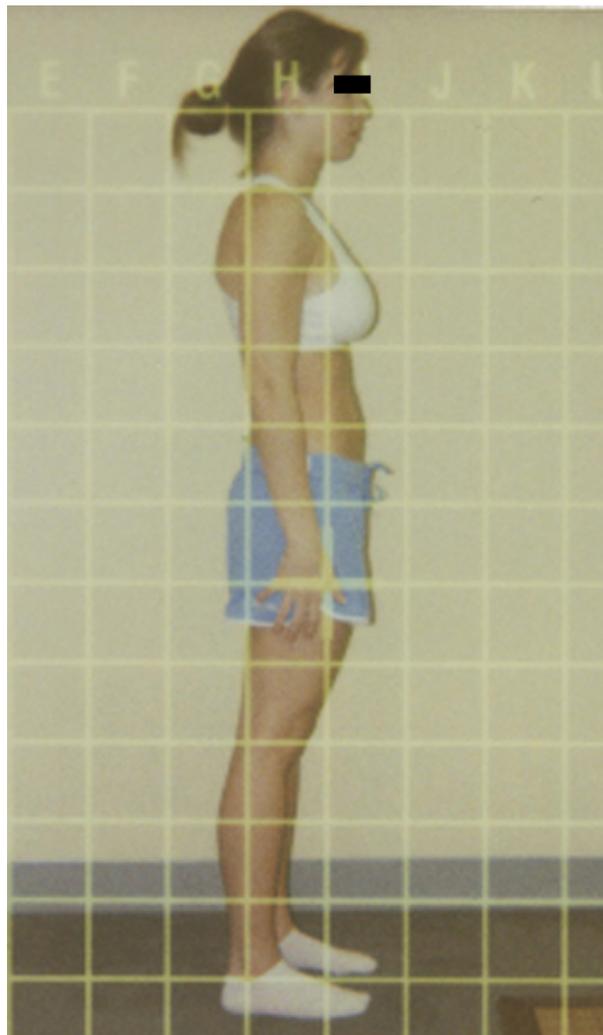


Figure 5 11/26/06 week 6 standing posture polaroid.

release of psoas 5 min; bilateral rib/sternum compression and rotation 3 min; and caudal release on sternum with cervical traction 4 min.

*Side-lying right (concave side lumbar):* Cross-hands release one hand over ilium and other over lateral ribs; sustained pressure release of quadratus lumborum 4 min.

*Prone:* Thoracic spine release with caudal pressure 4 min; bilateral rib release with caudal pressure 5 min; cross-hands release, one hand on sacrum and one over lumbar spine 5 min; wedging technique to correct pelvic asymmetry with wedge under right ASIS and left greater trochanter, and pressure directed in an anterior direction on left PSIS/iliac crest and right ischial tuberosity 5 min.

## Results

The subject improved in most measures, especially with pain (Table 2), combined thoracic and lumbar

rotation (see Tables 1 and 2), and posture as seen on Polaroid prints (see Figs. 2–5).

Pain levels improved significantly, as did quality-of-life measures (SRS-22) and pulmonary function (UCSD SOB) (Table 2).

The results of the self-reported questionnaires (see Table 2) are significant for the clinical and practical application and use of MFR for treatment of idiopathic scoliosis.

Most impressive were the quotes taken from the subject during the exit interview. The subject had been through years of traditional physical therapy without seeing significant improvement, and commented on how MFR has helped her throughout her 6-week treatment. "At first I was skeptical about MFR because it is a lot different from other types of treatment I have had in the past... I have never felt this much relief... I haven't had to use my heating pad for the past 2 weeks."

## Discussion

This case study has shown a significant improvement of the self-reported questionnaires and functional impairments of our subject. Images of the subject, that were taken in June 2005 (see Figs. 1a,b) and December 2006, show no further progression of her curve. This is the only research to our knowledge that utilizes only manual therapy techniques in the treatment of idiopathic scoliosis.

One of the many outcomes we hope to achieve as a result of this case study is to stimulate further interest, knowledge, and exploration of MFR as a treatment option for idiopathic scoliosis. Ideal candidates for future research studies may include a larger, younger sample size, before bracing with radiographic images directly prior, to be used as both a baseline and outcome measure. Research should also be used to determine the effects of MFR versus typical conservative techniques including bracing, of which there is little evidence to support improvements of Cobb angle and cosmesis (Weiss, 2003).

We also cannot be sure if the dosage of MFR was sufficient to achieve the maximal effect, possibly a longer duration of treatment and/or a shorter treatment time would have produced better outcomes. Considering the close proximity of the age of the subject and the corresponding diagnosis the results of this case report may prove to be applicable to those with diagnoses of either adolescent or adult idiopathic scoliosis.

In addition, the lack of available definitive evidence on the patient's peak bone growth, as well as her "young adult" age make it difficult to accurately determine the most appropriate approach to treatment. However, self-reported complaints of hip pain tend to leave the treating therapist with a focus more on controlling the pain and less on curve progression. The positive outcomes from the treatment the subject received suggest that those with a diagnosis of adolescent or adult idiopathic scoliosis may benefit from treatment techniques utilizing MFR. The results of this case study suggest further investigation is needed using MFR, as an effective manual therapy treatment for idiopathic scoliosis.

The authors confirm that no conflict of interest exists in publication of this research.

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