

# Guided Imagery for Adolescent Post-spinal Fusion Pain Management: A Pilot Study

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## ■ ABSTRACT:

Orthopedic surgery for adolescent idiopathic scoliosis entails anxiety and severe postoperative pain. The aim of this pilot study was to investigate an intervention for adolescent post-spinal fusion pain management in patients from a tertiary care hospital in Montreal, Canada. Participants were adolescents and young adults ages 11 to 20 years undergoing spinal fusion. Participants were randomized to standard care or standard care with adjunct intervention. The intervention consisted of a DVD with information and guided imagery/relaxation exercises to practice at least three times a week at home. A nurse screened the DVD with the patient preoperatively and at discharge (T1) and telephoned 2 weeks post-discharge (T2) to reinforce the technique. Both groups completed questionnaires at T1, T2, and T3 (1-month postoperative follow-up). Outcome measures included pain intensity, anxiety, coping mechanisms, and daily activities. From March 2010 to June 2011, we enrolled 40 of 45 eligible participants (n = 20 per group), average age 15 ± 2.1 years, 7 participants were male. Compared with the control group, the experimental group experienced significantly less overall pain at all time points, with moderate to large effect sizes at T2, T3 ( $p \leq .007$ ). Worst pain in 24 hours was moderately decreased at T2 ( $p = .01$ ). State-trait anxiety remained high. On a 10-point scale, a median 2.5-point benefit was seen in eating and sleeping (Mann-Whitney test,  $p = .002$ ), and 2 points in walking (Mann-Whitney test,  $p = .003$ ). Coping strategies showed no significant differences. Addition of a guided imagery and relaxation exercise DVD for home use was more effective than standard care alone for postoperative pain. Our non-pharmacologic adjunct looks promising. Larger sample size and

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longer (6-9 months) follow-up will permit refinement.

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## BACKGROUND

Adolescent idiopathic scoliosis is the most common orthopedic disorder in adolescents. Approximately 1 of every 1,000 adolescents develops a curvature of the spine significant enough to require surgery (Reamy & Slakey, 2001). Given the complex nature of the procedure, it is considered one of the most invasive surgeries in adolescents (Kotzer, 2000), with extensive tissue and bone trauma that entails severe postoperative pain, greater than 7 on a scale of 0 to 10 (Ip, Abrishami, Peng, Wong, & Chung, 2009). Furthermore, almost half of the patients suffer from prolonged postoperative pain at the surgical or donor site (Wong, Yuen, Chow, & Irwin, 2007), requiring high doses of analgesic drugs to provide optimal pain relief (Gagliese, Gauthier, Macpherson, Jovellanos, & Chan, 2008). The postoperative convalescence phase is all the more difficult given pervasive high-anxiety levels (LaMontagne, Hepworth, & Salisbury, 2001).

Progress has been made over the past 15 years in evaluating the effectiveness of relaxation with guided imagery on acute postoperative pain management, mainly in adults undergoing various types of surgery. Used before surgery, these techniques have been shown to reduce anxiety (Bugbee et al., 2005; Pellino et al., 2005), shorten hospital stays (Halpin, Speir, Capobianco, & Barnett, 2002), and significantly alleviate surgical and postsurgical pain, decreasing the need for analgesics (Antall & Kresevic, 2004).

To our knowledge, very few studies have probed the use of guided imagery and relaxation interventions in postoperative pain in pediatric patients (Huth, Broome, & Good, 2004; Lambert, 1996; LaMontagne, Hepworth, Cohen, & Salisbury, 2003; Polkki, Pietila, Vehvilainen-Julkunen, Laukkala, & Kiviluoma, 2008), with only one focusing on adolescents (LaMontagne et al., 2003). LaMontagne (2003) evaluated audiovisual interventions combining information and coping skills in the immediate postoperative period of adolescents undergoing spinal fusion surgery for idiopathic scoliosis. Findings revealed that a combination of information and coping skills rather than either alone had the most significant effect on anxiety and pain reduction, although results varied by age.

The objective of this randomized clinical trial, therefore, was to assess an intervention consisting of guided imagery and relaxation, combined with an

educational component, in adolescents and young adults undergoing spinal fusion for scoliosis, with respect to alleviating pain intensity, reducing anxiety, and enhancing coping.

## METHODS

### Study Design and Participants

We conducted a randomized clinical trial (pilot study) of an intervention combining guided imagery, relaxation, and education to decrease postoperative pain and anxiety related to spinal fusion, measured on the day of discharge, 14 days post-discharge, and 1 month post-discharge. The study was approved by our Institutional Research Ethics Board.

Study participants were recruited by a nurse from the orthopedic outpatient clinic of a major tertiary care pediatric teaching hospital in Montreal, Quebec, Canada, between March 2010 and June 2011. The hospital performs approximately 100 spinal fusions for idiopathic scoliosis per year. Eligible participants had to be between ages 11 and 20 years initially, require spinal fusion (posterior and/or anterior arthrodesis surgery) as first-line treatment for idiopathic scoliosis, be able to understand and write French, and have a computer or DVD player at home. Patients with moderate to severe cognitive deficit were not eligible for this study. Before recruitment, the deficit (if any) was confirmed from the patient's chart and, in case of doubt or lack of documentation, by consultation between the nurse and treating physician.

### Interventions

**Experimental Group.** The intervention was added to usual (standard) care. On the day before surgery, participants in the experimental group watched a 30-minute audiovisual presentation (on DVD) providing information on postoperative pain management with demonstrations of guided imagery and relaxation exercises. A research nurse was present, along with a parent, to provide explanations when needed. The DVD was given to the participant at the end of the session. At discharge, the same nurse again screened the DVD for the parent and participant, answering any questions that might arise. Participants were instructed to take the DVD home and practice the relaxation and guided imagery exercises at least three times a week. Two weeks after discharge, the research nurse telephoned participants to reinforce intervention techniques and answer further questions.

The DVD was prepared as a collaborative effort between two nurses, a physiotherapist, and a psychologist. The first part (nurses) consisted of information regarding the surgery and postoperative care with

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