

Pulmonary Function in Adult Scoliosis: A Case Report

by

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Introduction:

The efficacy of an outpatient three-dimensional exercise program for the treatment of adult scoliosis is evaluated. Thoracic scoliosis patients exhibit reduced vital capacity (VC) (<80% predicted for age and height) and chest expansion. To date, the long-term impact of these changes on health and function in scoliosis patients remain unexplored. However, reduced VC (<80%) is correlated with increased mortality in healthy subjects (Mannino et al., 2003; Thorax 58:388). In a previous study (Weiss, 1991; Spine 16:88), improved VC and chest expansion were documented across a population of 800 patients in a four-week intensive inpatient treatment. In this study, the potential for implementing the principles in an outpatient program is explored.

Materials /Methods:

The patient, 53 years, presents with a 37° right thoracic curve (Fig 1) from T4 to T11. Treatment consisted of a one-on-one three-hour per day Schroth program (Weiss, 1991). This nine-day program over a two-week period includes an initial examination, patient education, specific scoliosis mobilization (Figs 2), physio-logic® exercises (Fig 3), Schroth exercises (Figs 4a & 4b) and ADL's (Activities of Daily Living) (Figs 5a & 5b). Outcome measures included spirometry (Spiropet spirometer), chest expansion (tape measure), Cobb angle, and clinical photographs. Measurements were taken at intervals over five months. A patient of similar age with a curvature that did not involve upper thoracic vertebrae was included for comparison.

Figures:



Figure 1-Initial x-ray 53-year-old case study patient



Figure 2a -scoliosis specific spinal mobilization

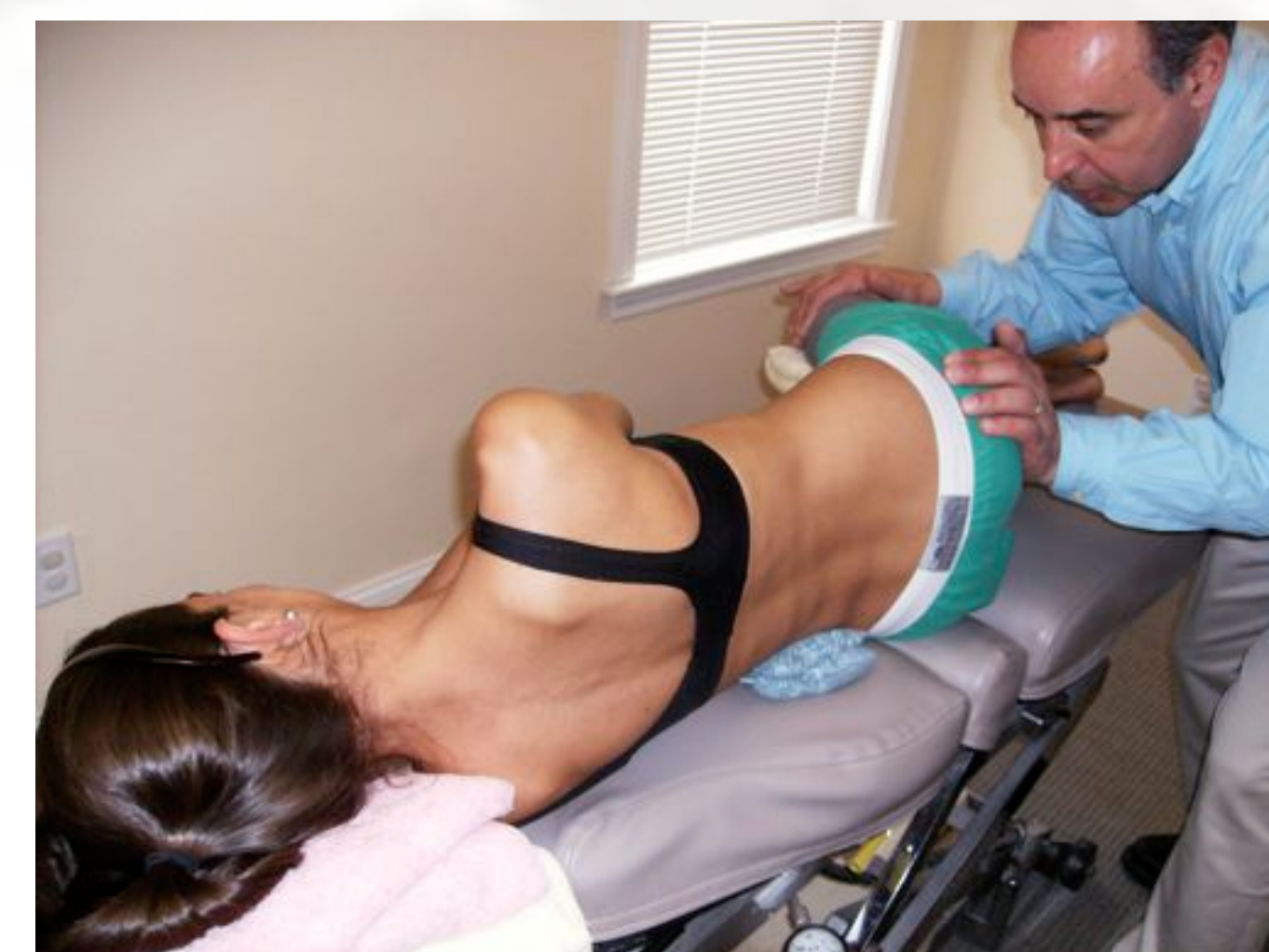


Figure 2b-scoliosis specific spinal mobilization

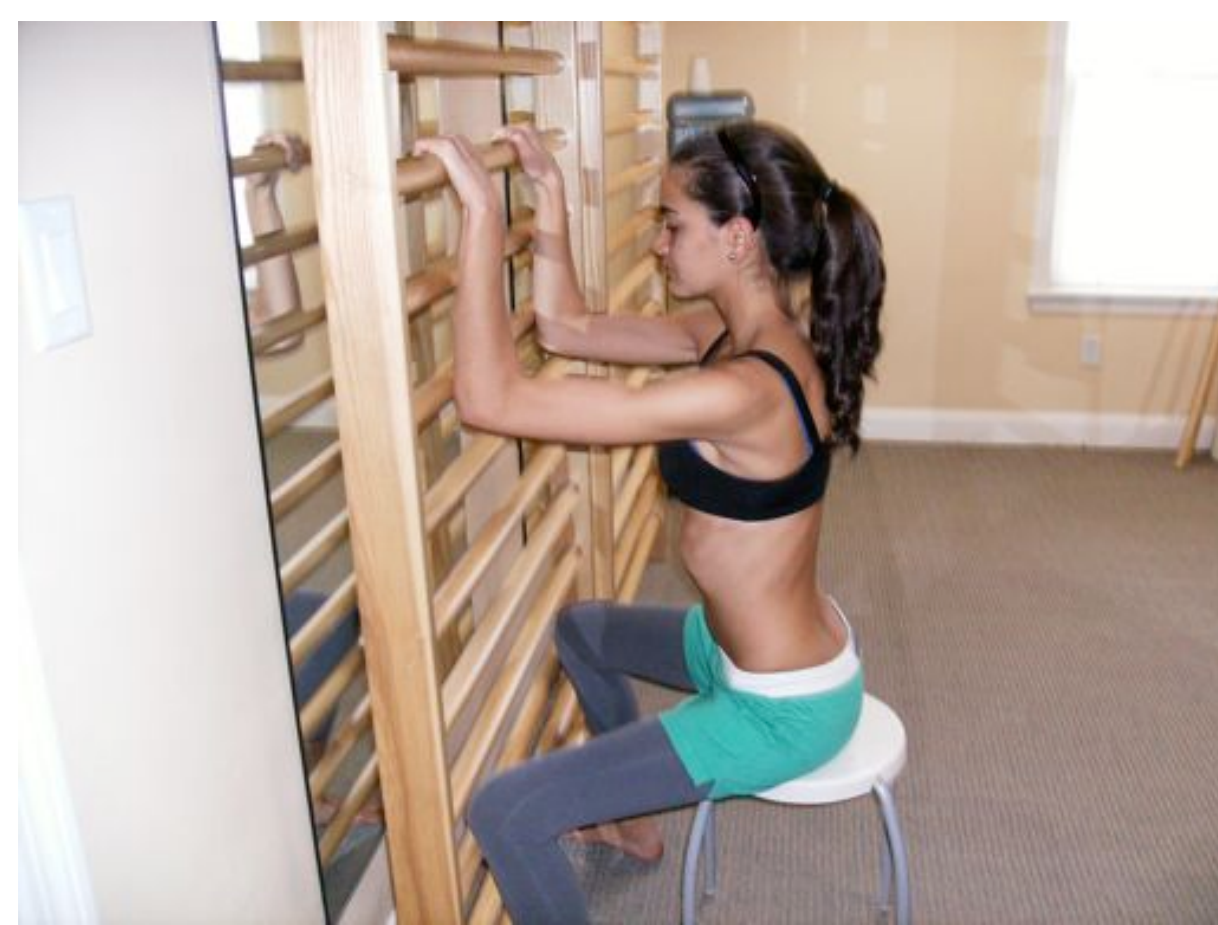


Figure 3-Physiologic® exercises to mobilize the thoracic and lumbar spine in the sagittal plane



Figure 4a-Schroth exercise-standing musclecylinder

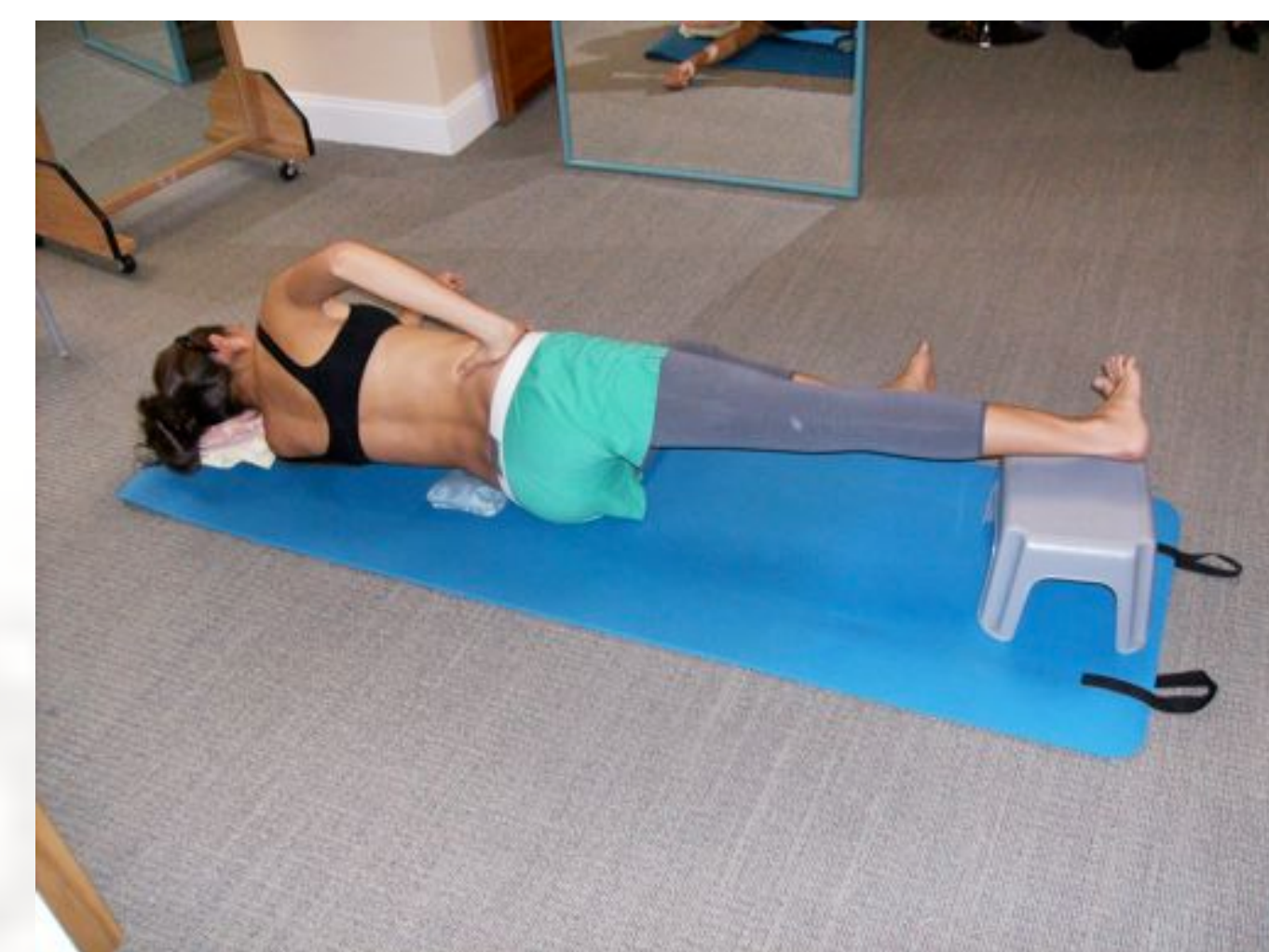


Figure 4b-Schroth exercise-sidelying musclecylinder



Figure 5a-Activities of Daily Living-incorrect seated position-contributes to risk of curve progression

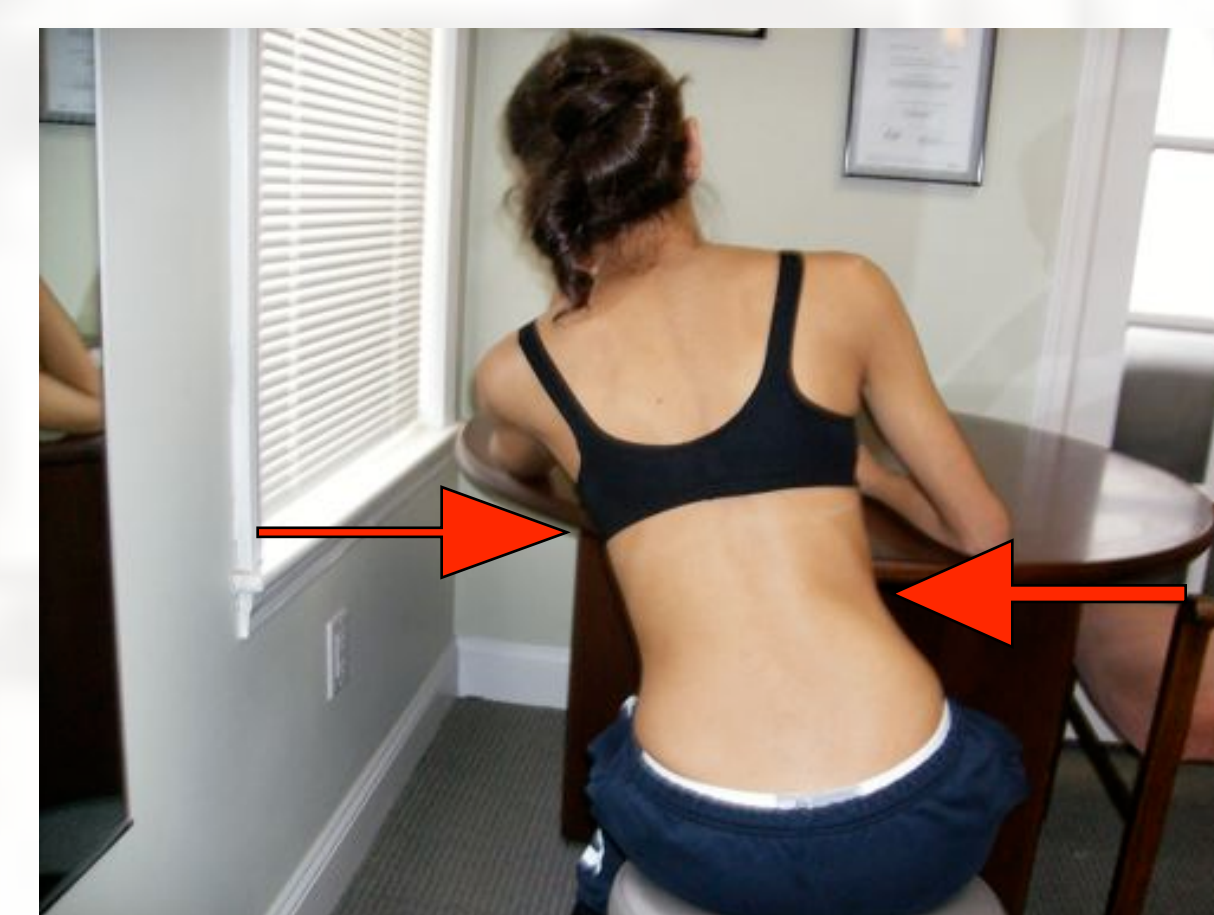


Figure 5b-Activities of Daily Living-corrected seated position-reduces asymmetric loading lessening risk of curve progression

Results:

Chest expansion improved from 4 cm (9/7/08) to 4.6 cm (9/16/08) to 5.0 cm (1/23/09). At the same time points, VC improved progressively from 2058 +63 ml (86% predicted) to 2358 +38 ml to 2517 +17 ml (105% predicted). No changes in VC or chest expansion occurred in the control case.

Conclusions:

A two-week intensive outpatient Schroth scoliosis program resulted in an 18% improvement in VC and a corresponding 20% increase in chest expansion, in an adult patient. The >450-ml increase in VC is comparable to results obtained with adult patients treated on an inpatient basis (Weiss, 1991). Long-term results will be followed.

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Acknowledgements: My sincerest thanks to Martha Hawes for her relentless encouragement to document my clinical results, to Hans-Rudolf Weiss for his continued guidance and insight, and to Axel Meier-Hennes for his extraordinary teaching skills.

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