Guided Exercise for the Treatment of Scoliosis

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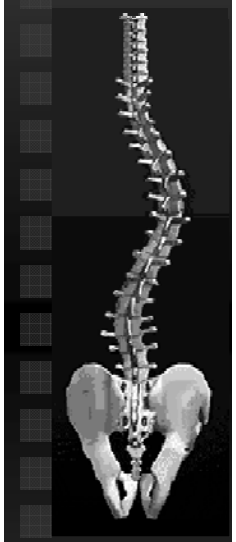
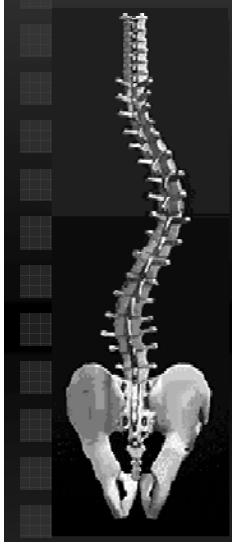
Methods of treatment for adolescent idiopathic scoliosis



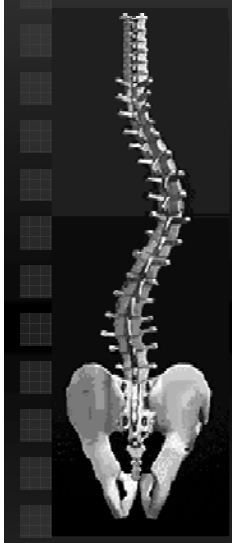
- **Bracing**
- **Spinal Fusion**
- **Exercise**
  - Significant documentation on the effectiveness of exercise as a treatment for scoliosis has only recently been shown in “A Preliminary Report on the Effect of Measured Strength Training in Adolescent Idiopathic Scoliosis”. Mooney, et al. *Journal of Spinal Disorders*, 2000.

A Consistent Finding in Adolescent Scoliosis Patients



- All adolescent scoliosis patients present with one common finding: the strength of trunk rotation is weaker to one side when compared to the other.
- Normal adolescents of the same age have equal torso rotation strength.
- Inhibition of paraspinal musculature prior to training.

PURPOSE OF THIS STUDY



- **To document the efficacy of exercise as a form of treatment for adolescent idiopathic scoliosis.**
- **To show that muscle imbalance and inhibition can be corrected with specific exercises isolating the appropriate musculature.**

Subjects

- N=20 (F=18 , M=2)
- Age=13.6±1.6 yrs

Inclusion Criteria:

- X-rays documenting a spinal curvature of over 10 degrees (Cobb's).
- Available to participate in strength training 2x/wk at US Spine & Sport.

MATERIALS & METHODS

- Participants trained on the MedX Torso Rotation Unit & the Backstrong (VARC) Machine.
- Training Sessions were 2x/wk (each lasting approximately 15 minutes).
- Participants trained for at least 3 months before reassessment (x-rays).

MedX Torso Rotation Unit

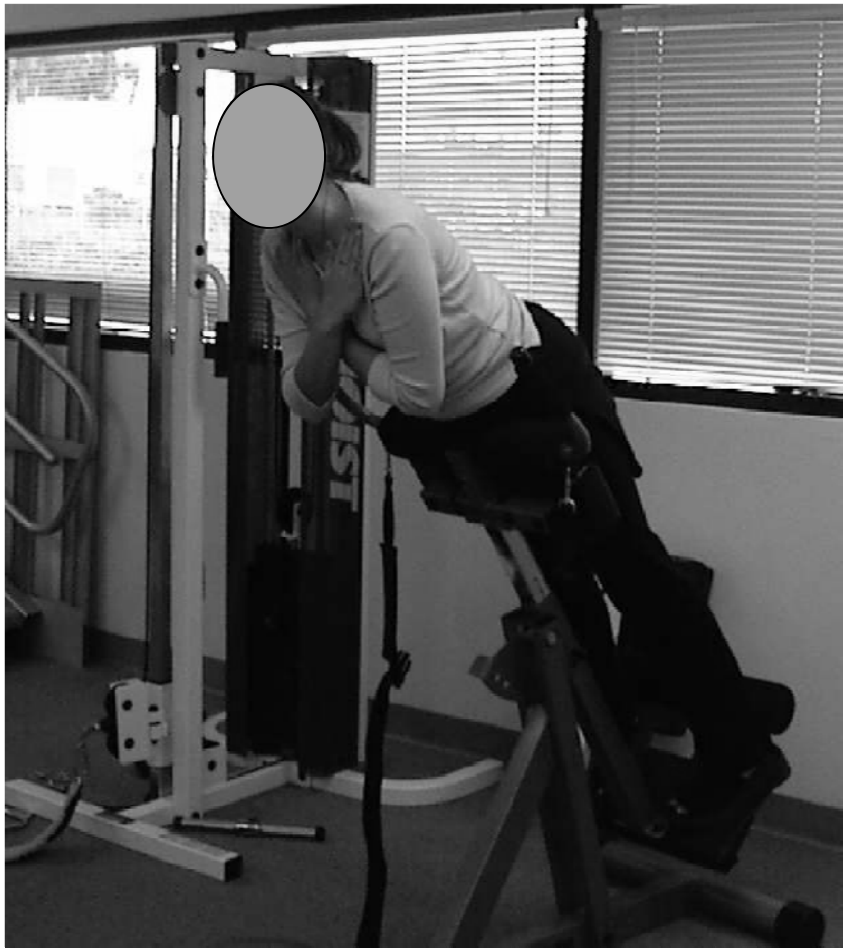
- Torso rotational strength training
- Alternating sides participants performed one set of 20 repetitions

MedX Torso Rotation Unit cont…

- Intensity was increased when subjects reported a RPL (Rate of Perceived Load) rating of 7 or less
- ROM was progressed as tolerated

Backstrong (VARC) Machine

- Lumbar extension PRE
- One set of 20 repetitions
- ↑ resistance by varying angle & arm position



Sample Exercise Card

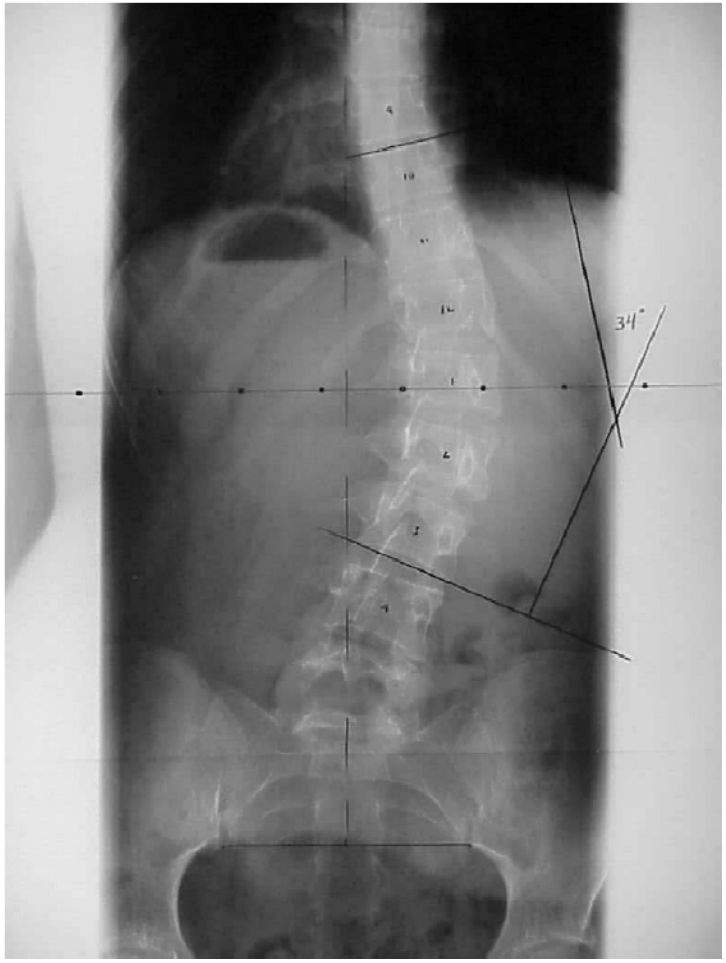
Data Analysis

- Strength (% change pre to post)
  - Mooney (n = 12): Isometric Strength
  - New study (n = 8): Dynamic Load
- Scoliotic Curvature
  - Repeated measures ANOVA ($p \leq 0.05$)
  - Training (Pre vs. Post)
  - Study (Mooney vs. new study)
  - Training x Study Interaction

RESULTS

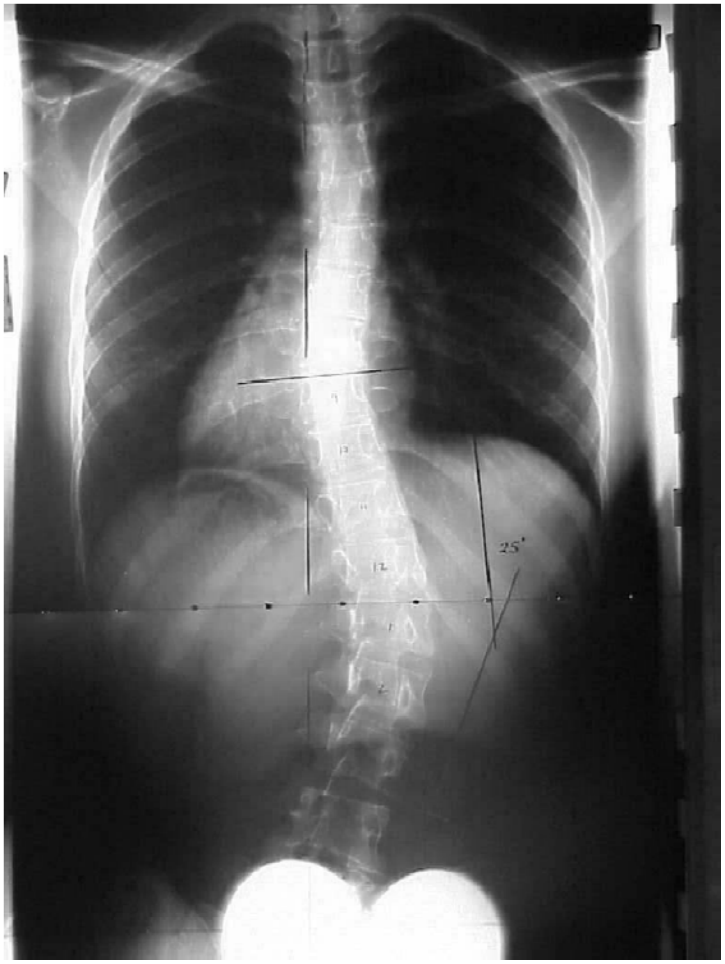
- Scoliotic curvature
  - No Training x Study interaction (p = 0.40)
  - 16/20 participants demonstrated curve reduction
  - Pre-training: 28.2 $\pm$ 13.2 °
  - Post-training: 23.0 $\pm$ 14.1°
  - % Change: 20.1 $\pm$ 23.3 % (p = 0.003)
- Strength
  - Mooney: 26.6 $\pm$ 11.6 % $\uparrow$ Isometric strength
  - New Study: 132.5 $\pm$ 61.4 % $\uparrow$ Dynamic load

Pre



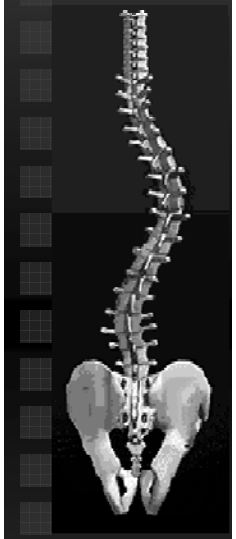
34° curvature

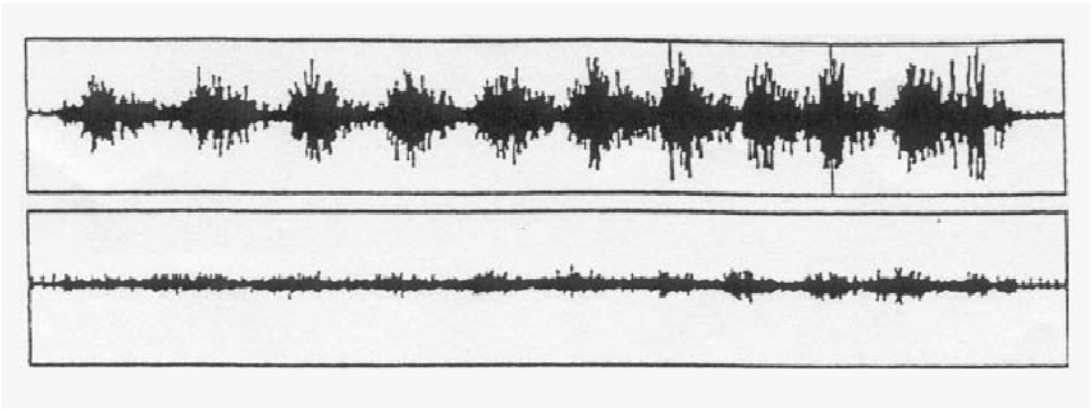
Post



25° curvature

EMG Results (Mooney, 2000)

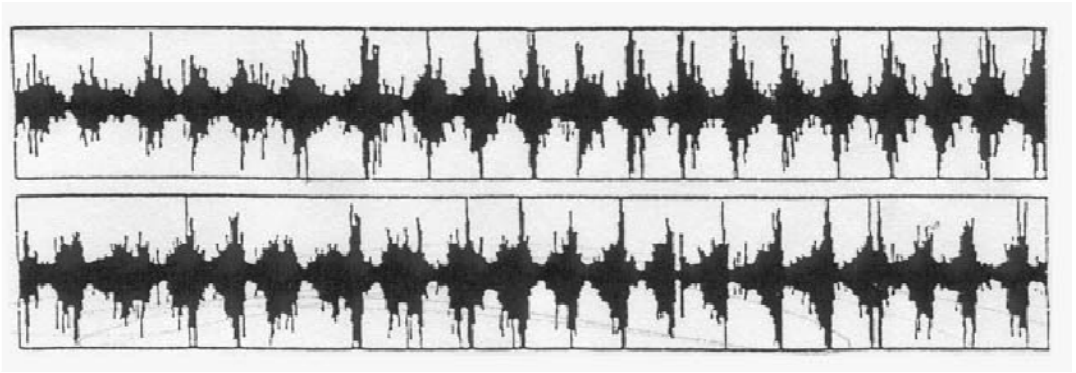




OBLIQUE

PARASPINAL

Figure 1: Beginning of the Study

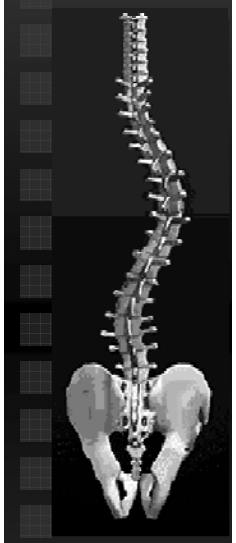


OBLIQUE

PARASPINAL

Figure 2: Conclusion of the Study

DISCUSSION



- Why has the effectiveness of exercise as a treatment for adolescent idiopathic scoliosis not previously been shown?
- Why were the Backstrong (VARC) & MedX Torso Rotation machines chosen for this study?

CONCLUSION

- Study documented the efficacy of exercise as a form of treatment for adolescent idiopathic scoliosis.
- Study demonstrated muscle imbalance and inhibition can be corrected with specific exercises isolating the appropriate musculature.

Limitations of the Study

- **Limited Number of Participants**
- **Participants not yet followed to skeletal maturity**
- **Duration of Study**
- **No Control Group**

IN THE FUTURE…

- Study is ongoing at U.S. Spine & Sport, San Diego, California.
- If you know of anyone that would benefit from this study please contact Vert Mooney, M.D. medical director of U.S. Spine & Sport .
- Special thanks to Dr. Mooney, Patrick Jones and all others who helped to make this study possible.