

# The Effect of Schroth Three-Dimensional Exercise on the Treatment of Moderate Adolescent Idiopathic Scoliosis

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## Abstract

Scoliosis is a deformity defined by a lateral curvature and vertebral rotation of the spine. Five articles were selected based upon sample size, year published and AIS outcomes measured. Critical appraisal of all studies showed improved Cobb angles moderate AIS patients who were treated with Schroth therapy. Unfortunately, one of the studies selected measured long-term outcomes, such as prevalence of surgery, during the trial. While each trial had limitations, there is clearly high potential for Schroth therapy as an adjunct therapy to moderate AIS. Further research must be performed to alter current guidelines for AIS.

## Introduction

### What is AIS?

- Lateral curvature, vertebral rotation of the spine

### Treatment

- Mild curvature: COB angle of 10-25', observation
- Severe curvature: COB angle 45+, spinal fusion surgery
- Moderate curvature: COB angle 25-45', observation and bracing

### The Problem

- Poor compliance, decrease quality of life, increased pain, limited function, respiratory complications; 30% go on to spinal fusion anyway

### Schroth 3D Physiotherapy

- Breathing techniques and posture correction with stimulation and mirror usage to improve COB angles (4-6 weeks, 6hrs/d x6d)

## Methods

### Literature Search Performed

- Google Scholar: "adolescent AND scoliosis AND treatment"
- PubMed: "scoliosis AND physical therapy versus brace"
- EBSCO: "scoliosis treatment AND bracing OR exercise"

### Selection Criteria

- Clinical trials and Random Control Trials
- Studies within 20 years
- Large sample size
- AIS Outcomes Measured (COBB angle required)

## Results

### Kuru, T., Yeldan I., Dereli E.E., et al.

- RCT of the effects of Schroth therapy on AIS Cobb angle (COB), hump height (HH), vertebral rotation (AOR), waist asymmetry (WA), and quality of life (QOL).

### Kwan, K., Cheng, A., Koh, H., Cheung, K.

- RCT of Schroth therapy on COB, QOL, AOR, and truncal shift (TS) compared to standard treatment.

### Otman S, Kose N, Yakut Y.

- Retrospective analysis of Schroth vs standard treatment on Cobb angle, vital capacity (VC), and muscle strength (MS).

### Schreiber S., Parent E., Moez E., et al.

- RCT of Schroth therapy on Cobb angle, spinal appearance (SA), and quality of life.

### Weiss H-R, Weiss G, Petermann F.

- Case controlled study measuring effects of Schroth therapy versus standard of treatment on only Cobb angle outcomes.

### Schroth Therapy vs Standard of Care

Study	Design	Total	Age	Base Curve	Timeline	Outcome
Kwan, et al.	RCT	48	10-15 yrs	25-40	8 wk	COB, QOL, AOR, TS
Kuru, et al.	RCT	45	10-18 yrs	10-60	6 mo	COB, AOR, HH, WA, QOL
Otman, et al.	Retro-spective	50	11-17 yrs	20-35	6 wk + home 12 mo	COB, VC, MS
Schreiber, et al.	RCT	50	10-18 yrs	10-45	6 mo	COB, SA, QOL
Weiss	Case Control	316	4-15 years	5-68	6 wk	COB

### Summary of Results

Study	COB	QOL	SA	VC	WA/HH/MS	AOR
Kwan	S	S	NS	NA	NA	NS
Kuru	S	NS	NA	NA	S	S
Otman	S	NA	NA	S	S *MS only	NA
Schreiber	S	S	S	NA	NA	NA
Weiss	S	NA	NA	NA	NA	NA

## Discussion

- All studies concluded that Schroth 3D physiotherapy helps **prevent progression and improve outcomes** in patients with AIS.
- Each study specifically concluded that **Cobb angles were improved** in patients utilizing Schroth 3D therapy versus just standard of treatment
- Strengths:** large sample populations, adequate duration of treatment, consistent outcome measurement of Cobb angles
- Improvement:** long term follow up, resulting need for spinal fusion surgeries, consistent outcome measurements in addition to Cobb angles, studies similar to *Kuru et al.*, that measure Schroth to observation and bracing separately

## Conclusion

- Schroth 3D therapy is well studied, effective therapy for AIS in Europe but little research has supported its use in the US.
- Each study concluded that Schroth 3D physiotherapy, when performed correctly, can help **prevent progression and improve outcomes in patients with AIS**. Each study provided sufficient evidence that Schroth therapy **improves Cobb angles**.
- There needs to be more evidence to support implementation of this treatment.**
- Clinical practice should continue to follow current guidelines for moderate AIS though current research shows promising outcomes with Schroth therapy.
- Future research should show long term effects of Schroth therapy on surgical outcomes as well as comparisons of the therapy to observation and bracing individually.

### References:

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