

OUTCOME OF SPINAL SCREENING

William P. Bunnell, M. D., Loma Linda, California 92354

Notice: Additional Research has indicated that 7 degrees ATR should be used as a criteria for referral instead of 5 degrees as before.

The Scoliosis Research Society currently recommends spinal screening for the 4,800,000 ten-year-old students in the U.S.A. The outcome of such screening is predicted by this study:

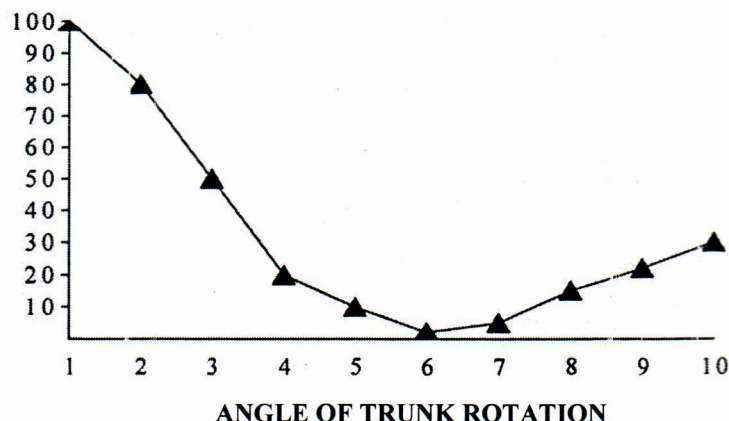
METHODS: One thousand students are screened both by the author and a school nurse using a Scoliometer to measure the angle of trunk rotation (ATR) at three levels of the spine. The largest of these measurements was recorded to determine the prevalence of clinical deformity and the degree of concurrence between examiners. These findings were correlated with data on 1,820 patients with known ATR and radiographic degrees of scoliosis to determine the need for treatment. Cost data predicted the total cost of the program and allowed comparison with the expected results and cost of not screening for spinal deformity.

FINDINGS: Complete concurrence of measurement between examiners was present in 33% of cases and was two degrees or less in 89% of the cases. Only 1.6% of students had a clinically straight spine with 80% of students having 3% or more of spinal rotation. The peak distribution of rotation was at three and four degrees. There was no difference between male and female prevalence. Referral rate is determined by the ATR chosen as the referral criterion and is 12% if 5 degrees ATR is chose, 6% at 6 degrees and 3% at 7 degrees ATR. An inverse relationship exists between the percentage of students referred and the percentage with treatment-eligible curves missed for any given ATR as seen in the graph below.

PREDICTED OUTCOMES: Natural history data would predict the need for 4,800 spinal fusion's at an annual cost of \$168 million if no screening is done. The cost of screening must include the cost of initial medical evaluations and x-rays for all referred as well as the cost of follow-up to age fifteen whether treated or not, in addition to the cost of braces and surgery for those who fail brace treatment. Assuming a 3% referral rate from screening programs with 10% of those referred treatment in braces and 10% failing brace treatment and requiring spinal fusion, the annual cost of the screening program is predicted to be \$221 million. Each additional 1% of students referred add \$74 million to this cost.

RECOMMENDATIONS: The ideal screening criterion minimizes both the number of referral and the number of treatment-eligible patients missed by the screen. This study suggests that 7 degrees ATR at any level of the spine is the ideal criterion for referral. Spinal screening programs are predicted to reduce the number of necessary spinal fusion's by 70% at a health care cost only slightly higher than that of the outcome of natural history.

REFERRED/MISSED STUDENTS



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