Clinical Guidelines And Primary Care

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Screening For Adolescent Idiopathic Scoliosis: A Report From The United States Preventive Services Task Force

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Editor's Note: The review of a recently released clinical policy published below requires a warning to readers. I am the author of this report and series editor of "Clinical Guidelines," as well as a member of the panel that produced the guideline being reviewed. Is objectivity possible under these circumstances? Three comments are pertinent. First, the paper was subjected to standard (blinded) peer review, and the decision for acceptance was made by John Geyman, *JABFP* editor. Second, the paper is more descriptive than evaluative. Policy statements from the United States Preventive Services Task Force (USPSTF) stopped after publication of the 1989 Guide to Clinical Preventive Services. The scoliosis policy discussed below is the first new policy released by the second USPSTF; and I, as a member of the new task force, take the opportunity below to update readers on the goals and process of the revived USPSTF. I believe that this insider's view has some value independent of the content under discussion, in this case scoliosis. Third, I am clearly biased in favor of the methods used by the task force, a bias that readers should consider with some care as they read the article.

Readers should be reassured that the long-term intent of this clinical policy review feature in *JABFP* is to have policies discussed by individuals not involved in their production. The discussion below is an exception.

Family physicians caring for adolescents discover scoliotic curves during physical examinations, either by routinely performing a screening test or by recognizing an obviously curved spine as part of some other examination. Most family physicians also have young patients referred to them for follow-up of spinal curvatures detected in school-based screening programs. Questions about the usefulness of screening and the proper follow-up examinations have troubled many pediatricians and family physicians.[1]

Because family physicians see unselected patients from the general population, their experience with scoliosis is likely to be with the less severe cases. Recommendations from specialists for extensive evaluation and treatment might not be appropriate for the primary care setting. This issue is important to family physicians because of the frequency of scoliosis in clinical practice and because of the potential for beneficial and harmful effects for their patients.

The United States Preventive Services Task Force (USPSTF) recently released its report on adolescent idiopathic scoliosis, concluding that there is insufficient evidence to recommend for or against routine screening for adolescent idiopathic scoliosis.[2] The strength of their recommendation is grade C based on categories II-3 and III study designs (Tables 1 and 2).

The intended audience for this recommendation comprises all physicians in primary care practice.

Information for this review was gathered from the published paper, from published research upon which the task force recommendation was based, from unpublished background papers used by the task force, and from the author's personal participation in task force sessions (see commentary above).

Submitted, revised, 5 May 1993.

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Importance of the Problem

Adolescent idiopathic scoliosis is thought to be an important health problem in the United States. Possible adverse effects of scoliosis cited by the

Table 1. US Preventive Services Task Force: Strength of Recommendations.*

Grade	Description
A	There is good evidence to support the recommendation that the condition be specifically considered in a periodic health examination
B	There is fair evidence to support the recommendation that the condition be specifically considered in a periodic health examination
C	There is poor evidence regarding the inclusion of the condition in a periodic health examination, but recommendations can be made on other grounds
D	There is fair evidence to support the recommendation that the condition be excluded from consideration in a periodic health examination
E	There is good evidence to support the recommendation that the condition be excluded from consideration in a periodic health examination

*Adapted from US Preventive Services Task Force.[4]

USPSTF include cosmetic deformities, back pain, social and psychological problems during childhood and adulthood, and the financial costs of late treatment. The task force, however, found the quality of evidence supporting these adverse effects to be weak. For example, the risk of back complaints appears to be similar in persons with and without idiopathic scoliosis.[3]

In 1989, 15 states required (by statute) screening adolescents for idiopathic scoliosis, and many other states have voluntary programs that are heavily promoted.

Summary of Guideline Development

The current USPSTF is a 10-member panel of primary care physicians and methodologists that serves an advisory function to the Office of Health Promotion and Disease Prevention within the US Public Health Service. The first task force (a much larger group) was appointed in 1984 and published the *Guide to Clinical Preventive Services* in 1989.[4] The second task force was appointed in 1990 and has been engaged in evaluating new topics and reassessing old ones for which new information is available. Guidelines for new topics are to begin regularly appearing in peer-reviewed journals, and a second edition of the *Guide to Clinical Preventive Services*, updating old chapters and incorporating new ones, is to be published in late 1994. Adolescent idiopathic scoliosis is a new topic for the task force.

Table 2. US Preventive Services Task Force Study Design Categories.

Categories	Study Design
I	Randomized controlled trials
II-1	Controlled trials without randomization
II-2	Cohort or case-control analytic studies
II-3	Multiple time series, dramatic uncontrolled experiments
III	Opinions of respected authorities, descriptive epidemiology

The method used by the USPSTF in formulating guidelines is that of an evidence-based expert panel and is well established. In evaluating screening for adolescent idiopathic scoliosis, the task force followed their standard practice, summarized below.

Literature Retrieval

English language literature since 1966 was retrieved through MEDLINE, using key words "scoliosis," "screening," "brace," "exercise," "surgery," and "physical therapy," linked by Boolean operators. Additional relevant references (published both before and after 1966) were selected through critical review of published articles and by query to authors recognized as experts in the field. Abstracts, unpublished data, and expert opinion not based on published evidence were excluded.

Articles were grouped according to standard task force practice: category I — randomized controlled trials; category II-1 — controlled trials without randomization; II-2 — cohort or case-control analytic studies; II-3 — multiple time series with or without the intervention, dramatic results in an uncontrolled experiment; category III — opinions of respected authorities, descriptive epidemiology (Table 2). Within each category articles were assessed for quality using established criteria.

Content of the Report

The USPSTF published analysis of scoliosis is presented in narrative format using a standard approach adopted by the task force: burden of suffering, natural history of curve progression, accuracy of screening tests, effectiveness of early detection, effectiveness of treatment, potential adverse effects, costs, recommendations of others, and conclusions. Task force analyses for each section are

briefly summarized below. Readers are referred to the original report for supportive references.

Burden of Suffering

Most adolescents have a small curvature; curvatures of 5 to 10 degrees are very common. The prevalence of curvatures greater than 20 degrees is about 0.3 percent. Evidence linking moderate scoliosis to adverse outcomes is limited. The task force concluded that evidence supporting a heavy burden of suffering for mild to moderate scoliosis does not exist.

Natural History of Curve Progression

The percentage of curvatures progressing more than 5 degrees has been as low as 5 percent in some studies but can be as high as 90 percent for adolescents with severe curves. Up to 75 percent do not progress, and some regress over time. The smallest curvatures have the least likelihood of progression.

Accuracy of Screening Tests and Effectiveness of Early Detection

Screening tests (principally the forward-bending test) themselves are sensitive to very small curves (as small as 3 degrees). There is no direct evidence from randomized controlled trials that screening produces better outcomes than not screening. Evidence of benefit that exists is based on studies comparing outcome before and after screening in targeted communities. These studies suggest the rate of surgery and brace treatment and the magnitude of curvatures might decrease in communities where screening has been instituted, but there is inadequate evidence that the trends are due to screening or that the trends have resulted in better clinical outcomes.

Effectiveness of Treatment

The task force evaluated evidence that available treatment modalities are effective — bracing, electrical surface stimulation, exercise, and surgery. Few controlled studies have been published regarding the effectiveness of any modality, and evidence of effectiveness is inconclusive. A large well-designed clinical trial of brace treatment is underway, but results are not yet available.

Potential Adverse Effects

Potential adverse effects of screening include labeling effects (e.g., psychological burden), exposure to radiographs, and diminished insurance and work eligibility, although few studies have provided direct evidence. Adverse effects of treatment are better understood, especially those associated with bracing and surgical treatments.

Costs

Few data on cost are available, and those that have been published suffer from methodological deficiencies (e.g., not taking into account costs of false-positive screening tests). Estimates of the costs of screening range up to about $4,000 for each case brought to treatment.

Recommendations of Others

The Scoliosis Research Society, the American Academy of Orthopedic Surgeons, the American Academy of Pediatrics, and many states recommend screening. The Canadian Task Force on the Periodic Health Examination, the British Orthopedic Association, and the British Scoliosis Society do not recommend screening.

Summary of the Final Recommended Clinical Guideline

Based on categories II-3 and III study designs (Table 2), the USPSTF found insufficient evidence to recommend for or against screening for adolescent idiopathic scoliosis (a grade C overall, Table 1). Small spinal curves are common. The natural history of scoliosis is such that most cases detected at screening will never progress, and the health implications of curvature progression are unclear. There have been no controlled studies demonstrating the effectiveness of screening. Indications for and effectiveness of treatment remain uncertain. Screening and treatment might have adverse effects, but these effects are no better documented than are the benefits. The report concludes with a call for clinical research to demonstrate the effectiveness of routine screening and treatment.

Commentary

Credibility

The USPSTF is among the oldest and most respected of the groups developing clinical guidelines. It aims to anchor the evidence-based end of the policy-writing continuum with a clearly defined and tested method containing safeguards to ensure that the guidelines produced are based as

much as possible on science rather than on global subjective judgment. Indeed, the rigor of its methods means that few clinical practices pass muster — the task force has been criticized for being too scientifically conservative, i.e., that its standards are too high. Its review of scoliosis will likely encounter the same criticism because it notes the failure of scientific evidence but without giving the clinician a clear view of what should actually be done in practice.

Validity

The task force attempts to keep its methods state-of-the-art, updating them regularly as new approaches become available. Application of the methods to the question of scoliosis was standard for the task force. Importantly, the task force methods are evidence-based, but they fall short of fully accounting for outcomes and patient preferences. David Eddy, one of the experts in clinical policy development, believes that the evidence-based approach used by the USPSTF is, by itself, incomplete.[5]

Relevance to Family Practice

Screening for adolescent idiopathic scoliosis is a common procedure in family practice. The development of a policy-guiding practice is relevant to family physicians.

Comprehensiveness

The task force narrowed the scope of its inquiry to adolescent idiopathic scoliosis, which accounts for about 65 percent of scoliosis cases. Congenital scoliosis (15 percent), scoliosis that is due to neuromuscular causes (10 percent), and scoliosis that is due to other known causes (10 percent) were specifically excluded. It further limited its inquiry to screening programs (the forward-bending tests) conducted in a school or office setting.

The method used by the task force is comprehensive in that it pays attention to the importance of the condition, causal pathways, an exhaustive literature review and critical analysis, benefits, adverse effects, and costs (where available). If outcome and preference data are available, the task force will use them, but it does not model outcomes based on available but inadequate data, as suggested by Eddy.[5] The policy was subjected to peer review by experts representing concurring and opposing viewpoints before submission for publication and during its evaluation for publication.

Flexibility

The policy is not a standard or a guideline. It would be classified as a practice option because neither the clinical outcomes nor patient preferences are known.

Suggestions for Further Research

The task force recommended better data regarding the association of idiopathic scoliosis with adverse health outcomes, especially low-back pain and psychological problems from the cosmetic deformity. It also underscored the need for randomized trials of screening programs and treatments to show that screening and treatment improve outcome.

Overall Assessment and Clinical Recommendation

This new topic is the first reported from the reconvened USPSTF, and it very much follows the approach taken by the earlier group. Judging from this report, practitioners can expect the same adherence to standard evaluative methods established by the 1989 *Guide to Clinical Preventive Services*[4] and other USPSTF publications in peer-reviewed journals. Its review of screening for adolescent idiopathic scoliosis focused on the many unresolved scientific questions that preclude making a definite recommendation. That other panels using evidence-based methods have reached the same conclusion — the Canadian Task Force on the Periodic Health Examination, the British Orthopedics and Scoliosis Societies — adds weight to the recommendation. Recommendations from American orthopedists and scoliosis experts appear to be based on the less rigorous method of global subjective judgment.

Importantly, however, the task force did not make a clear recommendation one way or the other; it assessed the evidence and found it insufficient. Although there is no strong evidence in favor of screening, there is no strong evidence against it either. This leaves family physicians in an uncertain position.

Some members of the USPSTF believe that, in the absence of evidence, the best clinical practice is not to screen using a formal protocol. The argument goes that, whatever else screening

might accomplish, if it is not supported by clear scientific evidence of benefit, it should not be performed. The USPSTF comments that it is reasonable (the word used is prudent) for family physicians to inspect the back visually in their examination of adolescents who are seen for other reasons, but that family physicians who do not formally include scoliosis screening in their examinations have no reason to start. The task force position is that physicians should be conservative (i.e., noninterventive) in labeling patients, in recommending further evaluation, and in recommending treatment, because most patients with mild curvatures will not experience progression and because the indications for and effectiveness of treatment are not clear.

If practicing in a community with mandated screening, the family physician might wish to work with the screening team in developing a conservative approach by limiting labeling, referral, and intervention to those with major curvatures.

Summary

The analysis of screening for adolescent idiopathic scoliosis published by the USPSTF is an important document, both because it reintroduces the task force as an important player in the clinical policies business and because it points (once again) to the deficiencies in our scientific understanding of a relatively common condition. Certainly medicolegal, cost, outcome, and patient preference issues not completely accounted for in the task force analysis need to be included in a fully developed clinical policy for this condition. The findings allow family physicians to use their own judgment pending publication of better and more complete data. On the whole the USPSTF analysis suggests that a nonaggressive approach toward screening is indicated until we have evidence clearly pointing one direction or the other.

References

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