

Putting Prevention into Practice

An Evidence-Based Approach

Screening for Lipid Disorders in Children and Adolescents

IRIS MABRY-HERNANDEZ, MD, MPH, *Medical Officer, U.S. Preventive Services Task Force Program, Agency for Healthcare Research and Quality*

RYAN GOTTFREDSON, DO, *Preventive Medicine Resident, Uniformed Services University of the Health Sciences*

► See related U.S. Preventive Services Task Force Recommendation Statement at <http://www.aafp.org/afp/2016/1215/od1.html>.

This PPIP quiz is based on the recommendations of the USPSTF. More information is available in the USPSTF Recommendation Statement and supporting documents on the USPSTF website (<http://www.uspreventiveservicestaskforce.org>). The practice recommendations in this activity are available at <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/lipid-disorders-in-children-screening1>.

This series is coordinated by Sumi Sexton, MD, Associate Deputy Editor.

A collection of Putting Prevention into Practice published in *AFP* is available at <http://www.aafp.org/afp/ppip>.

CME This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz on page 498. Author disclosure: No relevant financial affiliations.

Case Study

A healthy 12-year-old boy presents for a school physical and well visit. His family history reveals that his maternal grandfather had a heart attack at 75 years of age and that his 52-year-old father has started taking a medication for elevated cholesterol levels. The patient's blood pressure and body mass index are within normal limits for his age and height. His mother is concerned about his genetic risk of a cholesterol disorder and asks if he should be screened.

Case Study Questions

1. According to the U.S. Preventive Services Task Force (USPSTF), which one of the following statements about screening for familial hypercholesterolemia and multifactorial dyslipidemia in this patient is correct?

- A. There is high certainty that the net benefit of screening is substantial.
- B. There is at least moderate certainty that the net benefit of screening patients selectively is small.
- C. There is moderate to high certainty that screening has no net benefit or that the harms outweigh the benefits.
- D. The current evidence is insufficient to assess the balance of benefits and harms of screening for lipid disorders in children and adolescents.

2. The patient's mother asks about the possible harms of screening and/or treatment of lipid disorders. According to the USPSTF, which one of the following statements is correct?

- A. A large, good-quality body of evidence suggests that the benefits of lifelong statin treatment in children with familial hypercholesterolemia outweigh the harms.
- B. Adequate evidence demonstrates that a small amount of psychological harm is associated with false-positive results for both familial hypercholesterolemia and multifactorial dyslipidemia.
- C. The USPSTF found inadequate evidence to assess the harms of screening.
- D. Trials showed a statistically significant higher incidence of muscle pain among children with familial hypercholesterolemia taking statins vs. placebo.

3. Which of the following statements regarding long-term outcomes in children with multifactorial dyslipidemia are correct?

- A. It is difficult to predict which children and adolescents with multifactorial dyslipidemia will continue to have elevated cholesterol levels as adults.
- B. Children with multifactorial dyslipidemia are at significantly increased risk of early heart disease.
- C. Treating children with multifactorial dyslipidemia with pharmacotherapy and lifestyle modifications has not been shown to prevent or delay atherosclerosis.
- D. More than 80% of children with multifactorial dyslipidemia will have elevated cholesterol levels as adults.

Answers appear on the following page.

Answers

1. The correct answer is D. The USPSTF found inadequate direct evidence on the benefits of screening for familial hypercholesterolemia or multifactorial dyslipidemia in asymptomatic children and adolescents.¹ There was adequate evidence from short-term trials (less than two years) that pharmacotherapy results in substantial reductions in cholesterol levels; however, there was inadequate evidence to address whether short-term pharmacotherapy leads directly to reduced incidence of premature cardiovascular disease. There was inadequate evidence on the association between changes in intermediate lipid outcomes, such as lipid levels and noninvasive measures of atherosclerosis in children and adolescents, and reduced cardiovascular incidence or mortality in adults. The USPSTF issued an I statement after finding insufficient evidence on the balance of benefits and harms of screening for lipid disorders in children and adolescents. Health care professionals should use their clinical judgment when determining whether to screen for high cholesterol levels in persons 20 years and younger, weighing current scientific research, their own knowledge and experience, expert opinion, and the patient's health history, as well as the values and preference of patients and their families.

2. The correct answer is C. Overall, the USPSTF found inadequate evidence to assess the harms of screening for familial hypercholesterolemia or multifactorial dyslipidemia. A large body of good-quality evidence shows that the benefits of statin treatment among children and adolescents with definite familial hypercholesterolemia outweigh the harms in the short term (less than two years), but long-term data are lacking.² Some studies showed reversible elevations of liver enzymes, creatine kinase, or both. Long-term evidence on the treatment of familial hypercholesterolemia was limited to one study of statins, which did not show any severe, permanent harms. Reported adverse events in that study did not differ significantly between groups and were not generally believed to be associated with medication use. Treatment with

bile acid–sequestering agents was commonly associated with gastrointestinal symptoms and poor palatability. One trial of a low-fat, low-cholesterol dietary intervention in children with multifactorial dyslipidemia showed no harms.³

3. The correct answers are A and C. The association between elevated cholesterol levels in youth and cardiovascular disease in adulthood is poorly understood, making this finding a poor predictor of adult heart disease. A single longitudinal study of adolescents and young adults found no association between cholesterol levels and death before 55 years of age. Longitudinal studies suggest that elevated cholesterol levels in adolescence predict elevated cholesterol levels 15 to 20 years later (positive predictive value = 32.9% to 37.3%). Although it appears there is an increased risk of early heart disease in patients diagnosed with familial hypercholesterolemia, universal lipid screening approaches suggest a low diagnostic yield for detecting familial hypercholesterolemia in childhood, and no direct evidence has been found on the relationship between screening and outcomes in childhood or adulthood. Furthermore, there is a lack of convincing evidence that pharmacotherapy for elevated cholesterol levels decreases the incidence of cardiovascular events in adulthood.

The views expressed in this work are those of the authors, and do not reflect the official policy or position of the Uniformed Services University of the Health Sciences, the Department of Defense, or the U.S. government.

REFERENCES

1. US Preventive Services Task Force. Screening for lipid disorders in children and adolescents: US Preventive Services Task Force recommendation statement [published correction appears in *JAMA*. 2016;316(10):1116]. *JAMA*. 2016;316(6):625-633.
2. Lozano P, Henrikson NB, Dunn J, et al. Lipid screening in childhood and adolescence for detection of familial hypercholesterolemia: evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. 2016;316(6):645-655.
3. Lozano P, Henrikson NB, Morrison CC, et al. Lipid screening in childhood and adolescence for detection of multifactorial dyslipidemia: evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. 2016;316(6):634-644. ■