

Implementation of Lipid Screening Guidelines in Children by Primary Pediatric Providers

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Objective To assess the awareness and implementation of lipid guidelines among primary pediatric providers.

Study design An online survey was administered to primary pediatric providers (n = 1488): pediatricians, family medicine/general practitioners, and advanced practitioners (nurse practitioners/physician assistants) in Minnesota. The survey was conducted over 12 weeks in 2012-2013. A multiple-choice questionnaire was used to evaluate the participants' knowledge, screening, and management attitudes regarding pediatric lipid guidelines.

Results The overall response rate was 39% (n = 548 of 1402 successful e-mails). Respondents were primarily pediatricians and family medicine practitioners (37% each), followed by general practitioners (11%) and advanced practitioners (nurse practitioners, 5.5%; physician assistants, 1.6%). Although 74% of providers reportedly believed that lipid screening and treatment would reduce future cardiovascular risk, 34% performed no screening, 50% screened selectively, and only 16% performed universal screening. Pediatricians were more likely to screen, with 30% performing universal screening and 41% performing selective screening. Among perceived barriers to screening, providers reported uneasiness addressing lipid disorders (43%), and unfamiliarity with screening guidelines (31%). The majority (83%) were uncomfortable managing lipid disorders, and 57% were opposed to the use of lipid-lowering medications in children.

Conclusion These findings underscore the need to further educate providers and supply easily accessible information on the screening and treatment of childhood lipid disorders. (*J Pediatr* 2014;164:572-6).

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Atherosclerosis is a lifelong process proven to begin and progress throughout childhood and adolescence. Autopsy, epidemiologic, and longitudinal studies have demonstrated that dyslipidemia in youth is associated with the severity of atherosclerotic lesions in adulthood.¹⁻⁶

Between 1991 and 2008, a series of guidelines for lipid screening in children were published.⁷⁻¹⁴ In the early guidelines, criteria for screening were based on parental history of hyperlipidemia or premature cardiovascular (CV) disease; in the more recent guidelines, child risk factors were assessed. Recent studies have shown that relying on family history alone will miss 30%-60% of children with significant dyslipidemia.^{10,15,16} A study conducted by the National Heart, Lung, and Blood Institute (NHLBI) in 1988 with a follow-up in 1995 examined screening and management of lipid disorders in children.^{17,18}

A large body of evidence and debate among clinicians and epidemiologists has been published regarding the rationale and justification for dyslipidemia screening in children, and treatment with cholesterol lowering measures.¹⁹⁻²⁴ In response, in 2011, an expert panel convened by the NHLBI performed a rigorous and systematic review of the science and released the Integrated Guidelines for CV Health and Risk Reduction in Children and Adolescents,¹¹ endorsed by the American Academy of Pediatrics, which recommended universal screening for dyslipidemia in children aged 9-11 years. These recommendations are based on the concepts of primordial and primary prevention of CV risk factors in children.

In the present study, we hypothesized that pediatric lipid screening is currently inconsistent and incomplete, and sought to evaluate the awareness and implementation of published pediatric lipid guidelines among primary pediatric providers and understand the barriers for implementing lipid screening in current pediatric medical practice.

CV	Cardiovascular
FM	Family medicine
GP	General practitioner
HDL	High-density lipoprotein
NHLBI	National Heart, Lung, and Blood Institute
NP	Nurse practitioner
PA	Physician assistant

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Methods

After receiving approval from the University of Minnesota's Institutional Review Board (exempt status), an online survey was administered to a sample of primary pediatric providers, identified using the Minnesota state physician license list. The providers were identified as pediatricians (MD/DO), family medicine (FM) practitioners (MD/DO), general practitioners (GPs), pediatric subspecialists (MD/DO), physician assistants (PAs), and nurse practitioners (NPs). Only providers practicing in the 7-county Minneapolis/St Paul, Minnesota metropolitan area and Olmstead County (including Rochester, Minnesota) were contacted.

The survey consisted of 21 multiple-choice questions, including 3 demographic questions pertaining to the provider's medical specialty, clinical practice setting, and time since completion of medical training and 18 questions concerning the domains presented in the conceptual model to assess lipid valuation processes. Knowledge questions included familiarity with normal and abnormal lipid levels in children and awareness of lipid guidelines for children. Screening questions included whether or not the practitioner screened children, screening methods used, and barriers to screening. Management questions included comfort level in treating children with lipid disorders, approaches to treatment, and attitude toward use of medications in children with lipid disorders. The survey was pilot tested for clarity and refinement.

An introductory e-mail was sent containing a brief description of the study, consent information describing the voluntary and anonymous nature of the survey, and access to the Web-linked survey. The survey was administered through an online survey Web site (SurveyMonkey, Palo Alto, California). The introductory e-mail and survey were sent to a systematic sample of the providers who had a listed e-mail address in the Minnesota state physician license list for pediatricians and FM. An attempt was made to balance the 2 groups by sending e-mails only to the first 919 pediatric providers and 670 addresses on the FM/GP providers list.

A total of 1488 e-mails were sent to providers. Invalid e-mail addresses, returned e-mails, and duplicate e-mail addresses were classified as unsuccessful e-mails ($n = 86$). Participation was voluntary, and responses were tracked to determine which providers had taken the survey, but participant names and other identifiers were not collected. Nonresponders received an e-mail reminder after 4 weeks. The survey remained open for 12 weeks, from December 1, 2012, to February 28, 2013. No financial incentives were offered to respondents.

Frequency data were analyzed with the χ^2 test for categorical variables using SAS version 9.2 (SAS Institute, Cary, North Carolina).

Results

Out of the 1402 successful e-mails sent, 548 responses were received (response rate, 39%). The practice and training pro-

file of the study participants is characterized in **Table I**. Among the respondents, the predominant medical specialties were pediatricians and FMs, followed by GPs, NPs, and PAs. Providers classified as "other" (3%) described themselves as fellows in training, retired physicians, hospitalists, and radiologists. The largest clinical setting group was private practice, followed by community-based clinics and public health clinics. The majority of respondents were 6-10 years out from medical training. Based on type of training and specialty, primary providers were classified into 3 major categories: pediatricians, FM/GPs, and NPs/PAs. Owing to heterogeneity of the "other" category, these respondents were not included in the analyses.

Although 74% of respondents reported believing that lipid screening and treatment of children with dyslipidemia would reduce future CV risk, 34% did not perform any screening, 50% screened selectively based on family history (16%) or patient risk factors (34%), and only 16% performed universal screening (**Figure**). Only 7% of respondents believed that lipid disorders were not a problem in children. Compared with other specialties, a greater proportion of NP/PAs believed that lipid screening and treatment of children with dyslipidemia would reduce future CV risk, but pediatricians were more likely to perform universal screening (30%) or screening based on risk factors (41%).

All provider groups primarily used fasting lipid panels for screening (74%), followed by nonfasting lipid panels (13%), nonfasting total cholesterol (9%), and nonfasting non-high-density lipoprotein (HDL) cholesterol (5.9%) (data not shown). Pediatricians were more likely to use nonfasting lipid panels compared with FM/GPs and NP/PAs (22% vs 3% and 16%, respectively). The 3 groups had nearly identical use of nonfasting non-HDL cholesterol screening (6% for pediatricians and FM/GPs, 5% for NP/PAs).

Table I. Practice and training characteristics of the study participants ($n = 548$)

Characteristic	Number of responses (%)
Medical specialty ($n = 548$)	
Pediatrician	201 (36.7)
FM	203 (37.0)
GP	62 (11.3)
NP	30 (5.5)
PA	9 (1.6)
Subspecialist	29 (5.3)
Other	14 (2.6)
Clinical setting ($n = 542$)	
Private practice	161 (29.7)
Community clinic	152 (28.0)
Public health clinic	115 (21.2)
University/academic	87 (16.1)
Military	9 (1.7)
Indian Health Service	2 (0.4)
Other	16 (3.0)
Years since completion of medical training ($n = 546$)	
0-5	84 (15.4)
6-10	184 (33.7)
11-15	98 (17.9)
15-20	111 (20.3)
>20	69 (12.6)

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