

How Do Primary Care Physicians Identify Young Children with Developmental Delays? A National Survey

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Abstract

Little is known about the current practices of primary care physicians regarding developmental surveillance and screening during pediatric preventive care visits. We conducted a mailed survey of a random national sample of pediatricians and family physicians to describe their practices and identify factors that predict use of developmental screening tools, an efficacious way of identifying children with developmental delays. Most physicians reviewed developmental milestones and prompted parents for developmental concerns at preventive care visits. Approximately half of the physicians used a formal developmental screening instrument. Female physician gender predicted higher rates of use of screening tools for family physicians, but not for pediatricians. Most physicians seemed committed to the early diagnosis of developmental delays. Substantial variability in surveillance and screening practices, barriers of time and reimbursement, and under-reliance on parent-completed questionnaires underscore areas for improvement.

Developmental disabilities affect an estimated 17% of children in the United States. 1 In young children, disabilities often present as less specific delays in the acquisition of expected developmental milestones in speech, cognitive, adaptive, fine motor, or gross motor development. Early identification coupled with early treatment to address delays can improve outcome, enhance function, and reduce the development of secondary behavioral problems. 2–4 Young children with developmental delays, however, seem to be under-identified and underserved. From 1999 to 2000, approximately 1.8% of children aged less than 3 years received early intervention services in the United States under the Individuals with Disabilities Education Act Part C, whereas an estimated 5% of preschoolers were served under Part B. 5 These data indicate that a substantial proportion of infants and toddlers with developmental delays are not identified or fail to receive early intervention services.

Primary care physicians, because they routinely see children less than 5 years of age for preventive care visits, can play a key role in the early identification of developmental delays. 6 Although the primary care physician's role emphasizes monitoring and screening of the development of young children, limited information is available about physicians' actual practices in this area. One of the few studies to examine the issue noted that although 63% of a sample of 121 pediatricians reported using a developmental screening test, only 15% to 20% of these physicians screened more than 10% of their patients. 7 In another study using clinical scenarios to describe young children with a variety of developmental concerns, only 19% of pediatricians reported that use of a standardized developmental screening instrument would be included in their approach to a young child with language delay, and 38% of pediatricians would use such an instrument if parents raised a concern about possible mental retardation in their 3-

year-old child. 8 A study that updated these survey results 15 years later found that pediatricians reported higher rates of use of screening instruments (61% for the child with suspected mental retardation) and were more likely to refer the children described to be assessed by specialists. 9 These and other studies describing physician surveillance and screening behavior have been regional in scope and, in contrast with the current study, have focused on pediatricians to the exclusion of family physicians. 7–9

How might the identification of developmental delays in young children be improved? A recent survey of members of the American Academy of Pediatrics identified several relevant barriers to timely identification in primary care practice in general and to the use of validated screening tools in particular. 10 Barriers to the use of formal developmental screening instruments most frequently endorsed by physicians included insufficient time and reimbursement for this activity. 10 Many of the available provider-administered tools can consume the greater part of a preventive care visit if administered in a standardized fashion. Other important barriers to developmental screening identified in the survey included unfamiliarity with screening tools, the absence of nonphysician staff to participate in developmental screening, and unfamiliarity with billing codes related to this procedure. A minority of physicians were concerned about a lack of available developmental diagnostic and treatment services. 10

These barriers may be surmountable. Validated parent questionnaires have the potential to reduce the amount of provider time needed for developmental screening, thereby addressing one of the major identified barriers to this activity. 11–13 There is also evidence that parental concern about a child's development or behavior can be used as a reliable predictor of actual developmental delays. 14 The extent to which primary care physicians have adopted these newer methods for developmental surveillance and screening is not known.

To better understand how primary care physicians identify young children with developmental delays, we surveyed a national random sample of primary care pediatricians and family physicians. We gathered descriptive information regarding their self-reports of current developmental screening practices and tested several hypotheses regarding whether reported identification efforts varied depending on physician beliefs. First, we hypothesized that physicians who believed in the effectiveness of early intervention services would be more likely to report referral to these services in response to clinical vignettes describing young children with probable developmental delays. We predicted that physicians who reported that there are sufficient resources in their community to serve children with developmental delays would be more likely to provide referral for such services in response to clinical vignettes. Similarly, we predicted that physicians who report confidence in their ability to manage consultations and referrals for therapy would be more likely to make such referrals in response to the vignettes. Last, we predicted that there would be a negative association between physicians' belief in their ability to identify children with developmental delays on the basis of clinical expertise and the likelihood that physicians would report using a formal developmental screening tool in practice.

We also examined two associations identified by other investigators. Female physicians, compared with their male colleagues, exhibit higher rates of screening in adult medicine. 15–17 Among pediatricians in a recent survey, practitioners with more than 50% publicly insured patients or more than 40% non-white patients were more likely to report that they felt less

confident in their ability to perform developmental assessments (self-efficacy) and that they had less time to perform such assessments. 10

Pediatricians' Reported Practices Regarding Developmental Screening: Do Guidelines Work? Do They Help?

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Abstract

Background. In 2001, the American Academy of Pediatrics (AAP) adopted a policy that all infants and young children should be screened for developmental delays at regular intervals. The policy statement promoted the use of valid reliable instruments. It is unknown, however, what proportion of pediatricians follow this recommendation and whether such a practice is associated with improved identification of children with developmental difficulties.

Objectives. To describe the use of developmental screening tests among board-certified pediatricians practicing general pediatrics and to determine the association between standardized screening and the self-reported identification of children with developmental difficulties.

Methods. We mailed a survey to a random sample of AAP members. We used multivariate logistic/linear regression analyses to determine the association between standardized screening and the self-reported identification of children with developmental disabilities.

Results. Of the 1617 surveys mailed, 894 were returned, for a response rate of 55%. Of the respondents, 646 practiced general pediatrics and were included in the analysis. Seventy-one percent of those pediatricians indicated that they almost always used clinical assessment without an accompanying screening instrument to identify children with developmental delays. Only 23% indicated that they used a standardized screening instrument. The most commonly used

instrument was the Denver II. Logistic regression modeling demonstrated odds ratios between 1.71 and 1.90 for a >10% rate of identification of developmental problems among patients of pediatricians reporting standardized screening. Each adjusted odds ratio bordered on statistical significance. Linear-regression models estimating the difference in mean proportions of children identified with developmental problems across screening groups failed to show a statistically or clinically significant difference in physician-reported identification rates.

Conclusions. Our findings indicate that, despite the AAP policy and national efforts to improve developmental screening in the primary care setting, few pediatricians use effective means to screen their patients for developmental problems. It is uncertain whether standardized screening, as it is practiced currently, is associated with an increase in the self-reported identification of children with developmental disabilities.

Key Words: developmental screening early intervention screening tests developmental surveillance

Abbreviations: AAP, American Academy of Pediatrics

Children with developmental difficulties constitute between 12% and 16% of the general pediatric population.¹ Early diagnosis of such children is important, because evidence has demonstrated the effectiveness of early intervention for children with many developmental conditions.²⁶ Because 95% of children from birth through 3 years of age report a regular source of health care⁷ and because pediatricians have frequent contact with infants and young children, many think that primary care pediatricians are uniquely suited for the detection of young children with developmental difficulties.^{8,9}

Although only one half of families report that their children have ever received a developmental assessment performed by their doctors,¹⁰ virtually all general pediatricians report assessing developmental milestones as part of routine well-child care.¹¹ The methods by which they do so vary, however. Previous studies indicated that the most common developmental screening technique used in the primary care setting is informal clinical assessment¹ and that few pediatricians use standardized developmental screening tests routinely during health supervision visits.^{12,13} Unfortunately, clinical assessment alone detects <30% of children with developmental disabilities¹² and, at the present time, only 20% to 30% of children with disabilities are identified before school entrance.¹⁴ In contrast, standardized developmental screening instruments are reported to have sensitivities and specificities of 70% to 90%.^{15,18}

These factors led the American Academy of Pediatrics (AAP) to publish a policy statement in 2001, calling for universal developmental screening of infants and young children as part of routine well-child care. The statement emphasized the use of standardized screening tools that are practical and easy to use in the office setting.¹⁹ Pediatrician practices in the area of developmental screening, however, have not been reexamined systematically since the release of this statement.

The main purpose of this article is to describe the current use of developmental screening tests among a nationally representative sample of board-certified pediatricians. We also examine the

association between standardized screening and the self-reported identification of children with developmental disabilities.

METHODS

Context and Sample

This survey represented the 53rd in the series of AAP Periodic Surveys of Fellows conducted by the Division of Health Policy Research of the AAP. Each periodic survey is mailed to a unique random sample of US AAP members. For this survey, 1617 pediatricians were selected from the 49530 US AAP members who were active at the time of the study. An estimated 80% of US board-certified pediatricians are members of the AAP. This particular survey was part of a collaborative project of the AAP, the Federal Maternal and Child Health Bureau, the Department of Education Office of Special Education Programs, and the Office of Special Education Programs-funded ChildFind Project to obtain national data identifying barriers to pediatricians' participation in early intervention programs and to explore ways to address those barriers.

Instrument

The 8-page, self-administered survey was developed by an AAP-appointed work group of experts in early intervention from around the United States. The work group included general and developmental pediatricians, educators, physical and occupational therapists, psychologists, and parents. For the purpose of this survey, developmental delays or problems included motor, language, cognitive, behavioral, or emotional issues. The survey was approved by the AAP institutional review board.

The survey questioned respondents about the frequency with which they use a variety of formal and informal screening techniques to identify 0- to 35-month-old patients with developmental problems. Because the AAP policy statement promotes universal screening with a standardized instrument,¹⁹ we considered pediatricians to practice standardized screening only if they responded "always" or "almost always" to the question, "How often do you or your staff use the following methods or tools to identify children birth through 35 months of age at risk for developmental delay or problems" (in relation to the Bayley neurodevelopmental screen, Denver II, Ages and Stages Questionnaire, Parents' Evaluation of Developmental Status, or an unspecified "other" instrument).

Respondents were also asked, "What percent of your current patients <36 months old have been identified with a possible developmental problem through assessments/screens performed in your office" We analyzed this response both as a continuous variable and as a dichotomous variable, with a 10% cutoff value. We chose a 10% cutoff value because it represents a rounded conservative interpretation of the AAP's published estimate that 12% to 16% of children of this age have a developmental problem.

We used a 5-point Likert scale to assess barriers to performing developmental screening with young children. We scored Likert items positively if respondents "agreed" or "strongly agreed" with statements offered as possible barriers.

The demographic portion of the instrument included a series of questions validated by the AAP Department of Research.²⁰ Reported Medicaid and managed care participation was dichotomized relative to the median value of each continuous variable (for Medicaid: 30% participation; for managed care: 60% participation).

Survey Protocol

The survey instrument was mailed to each potential respondent between May and September 2002. Each questionnaire was accompanied by an introductory letter from the Executive Director of the AAP and a business-reply return envelope. Potential respondents received up to 6 mailings.

Statistical Analyses

Only pediatricians who provided health supervision were eligible to respond to survey items on developmental screening and referrals. We also restricted our analysis to pediatricians who reported spending 10% of their time in general pediatrics. From this pool of generalists, we excluded respondents who reported spending any time in a development-oriented specialty, including developmental or behavioral pediatrics, neurodevelopment/disabilities, neonatology or perinatology, genetics, and neurology.

For the study-eligible population, we calculated 4 regression models to describe the association between pediatricians' report of standardized screening and the self-reported identification of patients 0 to 3 years of age with a developmental problem. We used logistic regression to model the association between standardized screening and the identification of >10% of children with a developmental problem. We used linear regression to model the difference in means of reported identification rates between those reporting standardized screening and those not. For both the linear and logistic models, we restricted the analyses to pediatricians reporting an identification rate within 2 SDs of the total sample mean (32%). We imposed this last restriction because we thought it likely that responses higher than this would reflect either a misinterpretation of the survey item or an atypical practice setting. The regression models were as follows.

The first model was simple logistic/linear regression, showing the unadjusted association between standardized screening and physician-reported identification of children with developmental problems. The second model was multivariate logistic/linear regression, with the addition of only Medicaid participation to the simple model. We added Medicaid participation individually because of its empiric association with the report of both standardized screening and identification of children with developmental problems.

The third model was theoretically derived multivariate logistic/linear regression, in which covariates were included on the basis of their theoretical relevance as potential confounders of the relationship between standardized developmental screening and physician-reported identification of children with developmental problems. We chose the following covariates to include in this model: the gender and age of the pediatrician, managed care and Medicaid participation, the proportion of time spent in general pediatrics, whether the pediatrician

practiced in a medical school or university setting, and the proportion of patients 0 to 3 years of age seen in the respondent's practice. The fourth model was backward stepwise logistic/linear regression, in which the least significant variables (age, managed care participation, proportion of time in general pediatrics, and proportion of patients 0-3 years of age) were removed sequentially from the full theoretical model until each remaining variable had a P value of .2.

We chose to present 4 different models because there exists no previous research or rationale to suggest the validity of one over any of the others. In the absence of a clearly superior model, we considered it important to convey the stability of findings across a variety of acceptable models.

RESULTS

Survey Response

Of the 1617 surveys mailed, we received 894, for a total response rate of 55%. Respondents and nonrespondents were similar with respect to age, gender, AAP membership status, and geographic location (data not shown). The characteristics of the respondents in this survey were also similar to the known characteristics of the members of the AAP and to those of respondents to other Periodic Surveys conducted around that time.^{21,22}

Demographic Characteristics

Screening Instruments

Seventy-one percent of respondents reported always or almost always relying on nonstandardized methods to detect developmental problems among their 0- to 3-year-old patients (Table 2). Thirty-three percent reported always or almost always screening with a combination of nonstandardized methods and standardized tests, and 37% reported using a nonstandardized, office-generated checklist or similar method, typically completed by clinic staff members.

A minority of respondents (23% in total) reported always or almost always using a standardized screening instrument. Of all such instruments, the Denver II was the most commonly used. Only 41 pediatricians responded to the survey item concerning the use of other, unspecified, screening instruments; of those respondents, 49% reported using 1 such instrument. (It should be noted that multiple responses were possible; therefore, proportions do not add up to 100%.)

Characteristics of Respondents Using Standardized Tests Versus Nonstandardized Methods

Respondents using standardized tests were more apt to have a high proportion of Medicaid clients (60% vs 48%; $P = .03$) and were more likely to report a >10% rate of identification of developmental problems among their 0- to 3-year-old patients (26% vs 15%; $P = .01$) (Table 3). However, there were no differences in reported frequencies of children identified with developmental problems between those using standardized screening and those not (7.8% vs 6.8%; $P = .07$).

Multivariate Models

The results of multivariate regression models estimating the association between standardized screening and reported identification of developmental problems among children <3 years of age are shown in Table 4. Logistic regression models demonstrated odds ratios between 1.71 and 1.90 for a >10% reported rate of identification of developmental problems among pediatricians reporting standardized screening. The adjusted odds ratios did not change significantly across models, and each adjusted odds ratio bordered on statistical significance. Linear-regression models estimating the difference in the mean proportions of children reported to have been identified with developmental problems across screening groups failed to show a statistically or clinically significant difference; however, all regression coefficients demonstrated a trend toward higher reported identification rates among pediatricians reporting standardized screening.

Barriers to Screening

DISCUSSION

Our study indicates that a majority (71%) of general pediatricians reported using clinical assessments or other nonstandardized methods to monitor the early development of their patients. Only 23% reported consistently using standardized screening; among those respondents, the Denver II was the most widely used instrument. Although we showed a trend toward greater self-reported identification of children with developmental problems among those using standardized screening instruments, our data do not support a statistically significant association between standardized screening, as it is currently practiced, and self-reported detection of developmental problems.

Our results are consistent with previous studies, which showed that 15% to 40% of pediatricians reported using standardized screening^{12,13} and which suggested that the 2001 AAP policy statement has not affected practice widely. Furthermore, our inability to demonstrate an association between standardized screening and improved self-reported detection of developmental delays raises the questions of whether the performance characteristics of these instruments, particularly the Denver II, are maintained in the real world of general pediatric practice and whether such instruments are being used properly. Pediatricians cite time limitations, lack of staff, and inadequate reimbursement as the main barriers to standardized developmental screening.

A recent report by Sices et al²³ suggested that, in the absence of standardized screening, both pediatricians and family physicians are inconsistent regarding their referral patterns for children with possible developmental problems and tend not to consider important risk factors (such as parental concern) when deciding whether to refer patients. In the context of recent research on the importance of early brain development for optimal social and cognitive development²⁴ and evidence that early intervention programs can improve outcomes for patients with developmental disabilities,^{2,3} improving, eliminating the variability in, and providing rigorous effectiveness data for developmental screening practices in the primary care setting are important.

Glascoc and Macias²⁵ suggested several ways to incorporate developmental and behavioral screening into pediatric practice, including dissemination of evidence for using parental reports as a screening tool, links to information about local services, and information on coding and billing practices for adequate reimbursement for developmental screening. In addition, Halfon et al²⁶ argued for systems-level changes that would allow enhanced primary care-based developmental services and Zuckerman and Halfon²⁷ for policy-level efforts aimed at defining medical necessity and requiring reimbursement for these services.

Our study was limited by a number of factors. First, as with many surveys, social desirability biases might have compelled respondents to overestimate their attitudes and practices. Although we addressed this by defining positive responses conservatively, our cutoff values for certain variables are admittedly arbitrary. In addition, although our 55% response rate was consistent with normative values for survey research^{28,29} and respondents appeared representative of the members of the AAP, our findings may not be generalizable to all primary care pediatricians. The association between a higher self-reported rate of identification of developmental problems and screening practices might be confounded by nonmeasurable characteristics, such as respondents' personal interest in developmental issues or a different prevalence of developmental problems among patients of respondents who use standardized screening measures. Finally, it is not known how accurate pediatricians are at estimating the percentages of children in their practices whom they have identified as having developmental problems.

The results of this study should not be construed to mean that standardized, validated, screening tools fail to identify children with developmental problems. The performance characteristics of such tools demonstrate their accuracy to be well above that of informal methods,¹⁵¹⁸ and 1 recent study showed that, when providers switched to standardized instruments, detection rates increased significantly.³⁰ Our findings do, however, raise the concerns that systems of care that foster the proper use of adequate detection methods in the primary care setting continue to be elusive and that we may be missing an important window of opportunity to identify children's developmental problems and to intervene to alter their developmental trajectories favorably.

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FOOTNOTES

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The views expressed are those of the authors and not necessarily those of the American Academy of Pediatrics.

Dr Glascoe developed and has a financial interest in the Parent's Evaluation of Developmental Status developmental screening tool. This instrument is mentioned in the article along with a variety of other instruments. It is by no means a focus of the article.

REFERENCES

Glascoe FP. Early detection of developmental and behavioral problems. *Pediatr Rev.* 2000;21 :272 279

Guralnick MJ. *The Effectiveness of Early Intervention.* Baltimore, MD: PF Brooks Publishing; 1997

Bennett FC, Guralnick MJ. Effectiveness of developmental intervention in the first five years of life. *Pediatr Clin North Am.* 1991;38 :1513 1528

The Infant Health and Development Program. Enhancing the outcomes of low-birth-weight, premature infants: a multisite, randomized trial. *JAMA.* 1990;263 :3035 3042

Brooks-Gunn J, McCarton CM, Casey PH, et al. Early intervention in low-birth-weight premature infants: results through age 5 years from the Infant Health and Development Program. *JAMA.* 1994;272 :1257 1262

McCarton CM, Brooks-Gunn J, Wallace IF, et al. Results at age 8 years of early intervention for low-birth-weight premature infants: the Infant Health and Development Program. *JAMA.* 1997;277 :126 132

Newacheck P. Access to health care for disadvantaged young children. *J Early Interv.* 2002;25 :1 11

Shonkoff CJ, Green M. *Child development: a basic science for pediatrics,* by Julius B. Richmond, MD, *Pediatrics,* 1967;39:649-658. *Pediatrics.* 1998;102 :243 245

Zuckerman B, Parker S. New models of pediatric care. In: Halfon N, Schuster M, eds. *Child Rearing in America.* New York, NY: Cambridge University Press; 2002

Halfon N, Regalado M, Sareen H, et al. Assessing development in the pediatric office. *Pediatrics.* 2004;113(6 suppl) :1926 1933

Silverstein M, Grossman DC, Koepsell TD, Rivara FP. Pediatricians' reported practices regarding early education and Head Start referral. *Pediatrics*. 2003;111 :1351 1357

Smith RD. The use of developmental screening tests by primary care pediatricians. *J Pediatr*. 1978;93 :524 527

Minkowitz C, Mathew MB, Stobino D. Have professional recommendations and consumer demand altered pediatric practice regarding child development *J Urban Health*. 1998;75 :739 750

Palfrey JS, Singer JD, Walker DK, Butler JA. Early identification of children's special needs: a study in five metropolitan communities. *J Pediatr*. 1987;111 :651 659

Glascoe FP. Parents' concerns about children's development: prescreening technique or screening test *Pediatrics*. 1997;99 :522 528

Glascoe FP, Byrne KE, Ashford LG, Johnson KL, Chang B, Strickland B. Accuracy of the Denver-II in developmental screening. *Pediatrics*. 1992;89 :1221 1225

Macias MM, Saylor CF, Greer MK, Charles JM, Bell N, Katikaneni LD. Infant screening: the usefulness of the Bayley Infant Neurodevelopmental Screener and the Clinical Adaptive Test/Clinical Linguistic Auditory Milestone Scale. *J Dev Behav Pediatr*. 1998;19 :155 161

Squires J, Bricker D, Potter L. Revision of a parent-completed development screening tool: Ages and Stages Questionnaires. *J Pediatr Psychol*. 1997;22 :313 328

American Academy of Pediatrics, Committee on Children with Disabilities. Developmental surveillance and screening of infants and young children. *Pediatrics*. 2001;108 :192 195

Brotherton SE, Tang Sfs, O'Connor KG. Trends in practice characteristics: analyses of 19 periodic surveys (1987/1992) of Fellows of the American Academy of Pediatrics. *Pediatrics*. 1997;100 :8 18

Gupta VB, O'Connor KG, Quezada-Gomez C. Care coordination services in pediatric practices. *Pediatrics*. 2004;113(5 suppl) :1517 1521

Sices L, Feudtner C, McLaughlin J, Drotar D, Williams M. How do primary care physicians manage children with possible developmental delays A national survey with an experimental design. *Pediatrics*. 2004;113 :274 282

Shonkoff CJ, Phillips DA. *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academy Press; 2000

Glascoe FP, Macias MM. How can you implement the AAP's new policy on developmental and behavioral screening *Contemp Pediatr*. 2003;4 :85 104

Halfon N, Regalado M, McLearn KA, Kuo AA, Wright K. Building a Bridge From Birth to School: Improving Developmental and Behavioral Health Services for Young Children. New York, NY: Commonwealth Fund; 2003

Zuckerman B, Halfon N. School readiness: an idea whose time has arrived. *Pediatrics*. 2003;111 :1433 1436

Asch DA, Jedrzejewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol*. 1997;50 :1129 1136

Cummings SM, Savitz LA, Konrad TR. Reported response rates to mailed physician questionnaires. *Health Serv Res*. 2001;35 :1347 1355

Pelletier H, Abrams M. The North Carolina ABCD Project: A New Approach for Providing Developmental Services in Primary Care Practice. Portland, ME: National Academy for State Health Policy; 2002

Identifying Infants and Young Children With Developmental Disorders in the Medical Home: An Algorithm for Developmental Surveillance and Screening

1. Council on Children With Disabilities,
2. Section on Developmental Behavioral Pediatrics,
3. Bright Futures Steering Committee,
4. Medical Home Initiatives for Children With Special Needs Project Advisory Committee

Abstract

Early identification of developmental disorders is critical to the well-being of children and their families. It is an integral function of the primary care medical home and an appropriate responsibility of all pediatric health care professionals. This statement provides an algorithm as a strategy to support health care professionals in developing a pattern and practice for addressing developmental concerns in children from birth through 3 years of age. The authors recommend that developmental surveillance be incorporated at every well-child preventive care visit. Any concerns raised during surveillance should be promptly addressed with standardized developmental screening tests. In addition, screening tests should be administered regularly at the 9-, 18-, and 30-month visits. (Because the 30-month visit is not yet a part of the preventive care system and is often not reimbursable by third-party payers at this time, developmental screening can be performed at 24 months of age. In addition, because the frequency of regular pediatric visits decreases after 24 months of age, a pediatrician who expects that his or her patients will have difficulty attending a 30-month visit should conduct screening during the 24-month visit.) The early identification of developmental problems should lead to further developmental and medical evaluation, diagnosis, and treatment, including early developmental intervention. Children diagnosed with developmental disorders should be identified as children

with special health care needs, and chronic-condition management should be initiated. Identification of a developmental disorder and its underlying etiology may also drive a range of treatment planning, from medical treatment of the child to family planning for his or her parents.

Key Words:

- [development](#)
- [developmental disorders](#)
- [developmental screening](#)
- [disabilities](#)
- [children with special health care needs](#)
- [early intervention](#)
- [medical home](#)

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Responses to this article

- Update on Developmental Surveillance and Screening Recommendations
 - Paul H. Lipkin and
 - Michelle M. Macias, Paula Duncan, Joseph Hagan

Pediatrics published online February 17, 2009

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- Re: annual formal mental health screenings
 - Paul H. Lipkin

Pediatrics published online December 13, 2006

- [Full Text](#)
- annual formal mental health screenings
 - Walter L Harrison, MD

Pediatrics published online October 30, 2006

- [Full Text](#)

Statement of reaffirmation:

- FROM THE AMERICAN ACADEMY OF PEDIATRICS: Policy Statement: AAP Publications Retired and Reaffirmed *Pediatrics* 2010; 125:2 e444-e445; doi:10.1542/peds.2009-3160
 - [Extract](#)
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The following policy statement has been revised:

- AMERICAN ACADEMY OF PEDIATRICS: Developmental Surveillance and Screening of Infants and Young Children
 - Committee on Children With Disabilities

Pediatrics 2001; 108:1 192-195; doi:10.1542/peds.108.1.192

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Articles citing this article

- Preliminary Findings of Long-Term Neurodevelopmental Outcomes of Infants Treated With Intravenous Fat Emulsion Reduction for the Management of Parenteral Nutrition-Associated Cholestasis *JPEN J Parenter Enteral Nutr* 2014; 0:2014 0148607114551965v1-148607114551965
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Improving Developmental Screening Documentation and Referral Completion *Pediatrics* 2014; 134:4 e1181-e1188
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Moving beyond prevalence studies: screening and interventions for children with disabilities in low-income and middle-income countries *Arch. Dis. Child.* 2014; 99:9 840-848
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- NICU Follow-up Care: The Developmental and Advocacy Perspectives *Neoreviews* 2014; 15:8 e336-e343
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Developmental Screening in Rural Primary Care: Real-World Application *CLIN PEDIATR* 2014; 53:9 900-905
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
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 - [Full Text](#)
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- Designing Studies to Evaluate Parent-Mediated Interventions for Toddlers With Autism Spectrum Disorder *Journal of Early Intervention* 2014; 0:2014 1053815114542507v1-1053815114542507

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- Examining Antecedents of Caregivers' Access to Early Childhood Developmental Screening: Implications for Campaigns Promoting Use of Services in Appalachian Ohio *Health Promot Pract 2014; 15:3 413-421*
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 - [Full Text \(PDF\)](#)
- Brief Approaches to Developmental-Behavioral Promotion in Primary Care: Updates on Methods and Technology *Pediatrics 2014; 133:5 884-897*
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 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Psychometric examination of a Spanish translation of a developmental screening instrument *Journal of Early Childhood Research 2014; 0:2014 1476718X14529279v1-1476718X14529279*
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Access to Treatment for Toddlers With Autism Spectrum Disorders *CLIN PEDIATR 2014; 53:3 225-229*
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Identification of infants at risk for autism spectrum disorder and developmental language delay prior to 12 months *Autism 2014; 0:2014 1362361314521329v1-1362361314521329*
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Comparison of a broad-based screen versus disorder-specific screen in detecting young children with an autism spectrum disorder *Autism 2014; 18:2 76-84*
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Primary Care Physicians' Knowledge of and Confidence in Their Referrals for Special Education Services in 3- to 5-Year-Old Children *CLIN PEDIATR 2014; 53:2 166-172*
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Longitudinal Analysis of Developmental Delays in Children With Neurofibromatosis Type 1 *J Child Neurol 2013; 28:12 1689-1693*

- [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Service Coordinators' Perceptions of Autism-Specific Screening and Referral Practices in Early Intervention *Topics in Early Childhood Special Education* 2013; 33:3 153-161
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Creating a National Home Visiting Research Network *Pediatrics* 2013; 132:Supplement_2 S82-S89
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- The Prevalence of At-Risk Development in Children 30 to 60 Months Old Presenting With Disruptive Behaviors *CLIN PEDIATR* 2013; 52:10 942-949
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Early Intervention, IDEA Part C Services, and the Medical Home: Collaboration for Best Practice and Best Outcomes *Pediatrics* 2013; 132:4 e1073-e1088
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Ages and Stages Questionnaires-3 Developmental Screening of Infants and Young Children With Cancer *Journal of Pediatric Oncology Nursing* 2013; 30:5 235-241
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Pediatrician Identification of Latino Children at Risk for Autism Spectrum Disorder *Pediatrics* 2013; 132:3 445-453
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Socioeconomic disadvantage and developmental delay among US children aged 18 months to 5 years *J. Epidemiol. Community Health* 2013; 67:8 689-695
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Developmental Screening Referrals: Child and Family Factors That Predict Referral Completion *Topics in Early Childhood Special Education* 2013; 33:2 102-111
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Motor Delays: Early Identification and Evaluation *Pediatrics* 2013; 131:6 e2016-e2027
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Developmental assessment of children *BMJ* 2013; 346:jan15_2 e8687
 - [Full Text](#)
 - [Full Text \(PDF\)](#)

- Effectiveness of Developmental Screening in an Urban Setting *Pediatrics* 2013; 131:1 30-37
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Early Diagnosis of Minor Brain Damage in Infancy: The Complementary Nature of Clinical and Radiological Findings *Neoreviews* 2012; 13:9 e527-e531
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Neurodevelopmental Outcomes in Children With Congenital Heart Disease: Evaluation and Management: A Scientific Statement From the American Heart Association *Circulation* 2012; 126:9 1143-1172
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Concurrent Validity of Ages and Stages Questionnaires in Preterm Infants *Pediatrics* 2012; 130:1 e108-e114
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Language Development Survey Provides a Useful Screening Tool for Language Delay in Preterm Infants *CLIN PEDIATR* 2012; 51:7 638-644
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Instituting Parent Education Practices in the Neonatal Intensive Care Unit: An Administrative Case Report of Practice Evaluation and Statewide Action *ptjournal* 2012; 92:7 967-975
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Functional Difficulties and Health Conditions Among Children With Special Health Needs *Pediatrics* 2012; 129:3 e714-e722
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Social-Emotional Screening for Infants and Toddlers in Primary Care *Pediatrics* 2012; 129:2 e377-e384
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Comparison of Systematic Developmental Surveillance With Standardized Developmental Screening in Primary Care *CLIN PEDIATR* 2012; 51:2 154-159
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- From child health surveillance to child health promotion, and onwards: a tale of babies and bathwater *Arch. Dis. Child.* 2012; 97:1 73-77
 - [Abstract](#)

- [Full Text](#)
 - [Full Text \(PDF\)](#)
- Book/Media Review: A Clinical Guide to Autistic Spectrum Disorders *J Child Neurol* 2012; 27:1 132-133
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Early Childhood Adversity, Toxic Stress, and the Role of the Pediatrician: Translating Developmental Science Into Lifelong Health *Pediatrics* 2012; 129:1 e224-e231
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Disparities in Provider Elicitation of Parents' Developmental Concerns for US Children *Pediatrics* 2011; 128:5 901-909
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Providing a Primary Care Medical Home for Children and Youth With Cerebral Palsy *Pediatrics* 2011; 128:5 e1321-e1329
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Diagnosis and management of autism in childhood *BMJ* 2011; 343:oct21_1 d6238
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Duration of a Well-Child Visit: Association With Content, Family-Centeredness, and Satisfaction *Pediatrics* 2011; 128:4 657-664
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Enhancing the Algorithm for Developmental-Behavioral Surveillance and Screening in Children 0 to 5 Years *CLIN PEDIATR* 2011; 50:9 853-868
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Learning Disabilities and School Failure *Pediatr. Rev.* 2011; 32:8 315-324
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Efforts must continue to improve developmental screening rates, payments *AAP News* 2011; 32:8 15
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Pediatricians' use of developmental screening tools on the rise *AAP News* 2011; 32:8 15
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Identification of Developmental-Behavioral Problems in Primary Care: A Systematic Review *Pediatrics* 2011; 128:2 356-363
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)

- Trends in the Use of Standardized Tools for Developmental Screening in Early Childhood: 2002-2009 *Pediatrics* 2011; 128:1 14-19
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Supporting the Health Care Transition From Adolescence to Adulthood in the Medical Home *Pediatrics* 2011; 128:1 182-200
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- French Norms and Validation of the Child Development Inventory (CDI): Inventaire du Developpement de l'Enfant (IDE) *CLIN PEDIATR* 2011; 50:7 636-647
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Rates of Parent-Centered Developmental Screening: Disparities and Links to Services Access *Pediatrics* 2011; 128:1 146-155
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Early Autism Detection: Are We Ready for Routine Screening? *Pediatrics* 2011; 128:1 e211-e217
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Speech and Language Development: Monitoring Process and Problems *Pediatr. Rev.* 2011; 32:6 230-239
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Trends in the Prevalence of Developmental Disabilities in US Children, 1997-2008 *Pediatrics* 2011; 127:6 1034-1042
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- The Each Child Study: Systematic Screening for Autism Spectrum Disorders in a Pediatric Setting *Pediatrics* 2011; 127:5 866-871
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Measuring outcomes in outpatient child psychiatry: The contribution of electronic technologies and parent report *Clin Child Psychol Psychiatry* 2011; 16:1 146-160
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Developmental Screening and Parents' Written Comments: An Added Dimension to the Parents' Evaluation of Developmental Status Questionnaire *Pediatrics* 2010; 126:Supplement_3 S170-S176
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)

- Enhancing Developmentally Oriented Primary Care: An Illinois Initiative to Increase Developmental Screening in Medical Homes *Pediatrics* 2010; 126:Supplement_3 S160-S164
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Developmental Milestones: Cognitive Development *Pediatr. Rev.* 2010; 31:9 364-367
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Small Changes Can Have Large Impacts: Health Care Overhaul Should Include Child Maltreatment Prevention in Primary Care *American Journal of Medical Quality* 2010; 25:5 334-335
 - [Full Text \(PDF\)](#)
- Improving Developmental Screening in Pediatric Resident Education *CLIN PEDIATR* 2010; 49:8 737-742
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Developmental Milestones: Motor Development *Pediatr. Rev.* 2010; 31:7 267-277
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Parenting Behaviors, Perceptions, and Psychosocial Risk: Impacts on Young Children's Development *Pediatrics* 2010; 125:2 313-319
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Improved Detection of Developmental Delays Among Young Children in Foster Care *Pediatrics* 2010; 125:2 282-289
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Implementing Developmental Screening and Referrals: Lessons Learned From a National Project *Pediatrics* 2010; 125:2 350-360
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Development and Validation of a New Lucknow Development Screen for Indian Children Aged 6 Months to 2 Years *J Child Neurol* 2010; 25:1 57-60
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Initiatives target developmental screening services *AAP News* 2010; 31:1 24
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Implementing Electronic Health Record-Based Quality Measures for Developmental Screening *Pediatrics* 2009; 124:4 e648-e654
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- PEDS and ASQ Developmental Screening Tests May Not Identify the Same Children *Pediatrics* 2009; 124:4 e640-e647

- [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Sugar-coaters and Straight Talkers: Communicating About Developmental Delays in Primary Care *Pediatrics* 2009; 124:4 e705-e713
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Reflecting on "Reflections on Well-Child Care Practice" *Pediatrics* 2009; 124:3 990-991
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Trajectories and Predictors of the Development of Very Young Boys with Fragile X Syndrome *J Pediatr Psychol* 2009; 34:8 827-836
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- No Change in the Age of Diagnosis for Fragile X Syndrome: Findings From a National Parent Survey *Pediatrics* 2009; 124:2 527-533
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Developmental Screening: Is There Enough Time? *CLIN PEDIATR* 2009; 48:6 648-655
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Lowering Developmental Screening Thresholds and Raising Quality Improvement for Preterm Children *Pediatrics* 2009; 123:6 1516-1523
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Clinical Assessment and Management of Toddlers With Suspected Autism Spectrum Disorder: Insights From Studies of High-Risk Infants *Pediatrics* 2009; 123:5 1383-1391
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Routine Developmental Screening Implemented in Urban Primary Care Settings: More Evidence of Feasibility and Effectiveness *Pediatrics* 2009; 123:2 660-668
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Managing Referrals for Children with Receptive Language Delay *CLIN PEDIATR* 2009; 48:1 72-80
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Assessment in Early Childhood: Instruction-Focused Strategies to Support Response-to-Intervention Frameworks *Assessment for Effective Intervention* 2008; 34:1 25-34
 - [Abstract](#)
 - [Full Text \(PDF\)](#)

- Communication About Child Development During Well-Child Visits: Impact of Parents' Evaluation of Developmental Status Screener With or Without an Informational Video *Pediatrics* 2008; 122:5 e1091-e1099
 - [Abstract](#)
 - [Full Text](#)
 - [Full Text \(PDF\)](#)
- Family Stress and Children's Language and Behavior Problems: Results From the National Survey of Children's Health *Topics in Early Childhood Special Education* 2008; 28:3 148-157
 - [Abstract](#)
 - [Full Text \(PDF\)](#)
- Selecting Developmental Surveillance and Screening Tools *Pediatr. Rev.* 2008; 29:10 e52-e58
 - [Full Text](#)
 - [Full Text \(PDF\)](#)

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Policy Statement-Reprinted From the American Academy of Pediatrics

THE APGAR SCORE

American Academy of Pediatrics; Committee on Fetus and Newborn; American College of Obstetricians and Gynecologists; Committee on Obstetric Practice

Abstract

The Apgar score provides a convenient shorthand for reporting the status of the newborn infant and the response to resuscitation. The Apgar score has been used inappropriately to predict specific neurologic outcome in the term infant. There are no consistent data on the significance of the Apgar score in preterm infants. The Apgar score has limitations, and it is inappropriate to use it alone to establish the diagnosis of asphyxia. An Apgar score assigned during resuscitation is not equivalent to a score assigned to a spontaneously breathing infant. An expanded Apgar score reporting form will account for concurrent resuscitative interventions and provide information to improve systems of perinatal and neonatal care.

Family Pediatrics

Report of the Task Force on the Family

1. American Academy of Pediatrics

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Abstract

Why a Task Force on the Family? The practice of pediatrics is unique among medical specialties in many ways, among which is the nearly certain presence of a parent when health care services are provided for the patient. Regardless of whether parents or other family members are physically present, their influence is pervasive. Families are the most central and enduring influence in children's lives. Parents are also central in pediatric care. The health and well-being of children are inextricably linked to their parents' physical, emotional and social health, social circumstances, and child-rearing practices. The rising incidence of behavior problems among children attests to some families' inability to cope with the increasing stresses they are experiencing and their need for assistance. When a family's distress finds its voice in a child's symptoms, pediatricians are often parents' first source for help.

There is enormous diversity among families—diversity in the composition of families, in their ethnic and racial heritage, in their religious and spiritual orientation, in how they communicate, in the time they spend together, in their commitment to individual family members, in their connections to their community, in their experiences, and in their ability to adapt to stress. Within families, individuals are different from one another as well. Pediatricians are especially sensitive to differences among children—in their temperaments and personalities, in their innate and learned abilities, and in how they view themselves and respond to the world around them. It is remarkable and a testament to the effort of parents and to the resilience of children that most families function well and most children succeed in life.

Family life in the United States has been subjected to extensive scrutiny and frequent commentary, yet even when those activities have been informed by research, they tend to be influenced by personal experience within families and by individual and cultural beliefs about how society and family life ought to be. The process of formulating recommendations for pediatric practice, public policy, professional education, and research requires reaching consensus on some core values and principles about family life and family functioning as they affect children, knowing that some philosophic disagreements will remain unresolved. The growing multicultural character of the country will likely heighten awareness of our diversity.

Many characteristics of families have changed during the past 3 to 5 decades. Families without children younger than 18 years have increased substantially, and they are now the majority. The average age at marriage has increased, and a greater proportion of births is occurring to women older than 30 years. Between 1970 and 2000, the proportion of children in 2-parent families decreased from 85% to 69%, and more than one quarter (26%) of all children live with a single parent, usually their mother. Most of this change reflects a dramatic increase in the rate of births to unmarried women that went from 5.3% in 1960 to 33.2% in 2000. Another factor in this change is a slowly decreasing but still high divorce rate that is roughly double what it was in the mid-1950s.

Family income is strongly related to children's health, and the financial resources that families have available are closely tied to changes in family structure. Family income in real dollars has

trended up for many decades, but the benefits have not been shared equally. For example, the median income of families with married parents has increased by 146% since 1970, but female-headed households have experienced a growth of 131%. More striking is that in 2000, the median income of female-headed households was only 47% of that of married-couple families and only 65% of that of families with 2 married parents in which the wife was not employed. Not surprising, the proportion of children who live in poverty is approximately 5 times greater for female-headed families than for married-couple families.

The composition of children's families and the time parents have for their children affect child rearing. Consequent to the increase in female-headed households, rising economic and personal need, and increased opportunities for women, the proportion of mothers who are in the workforce has climbed steadily over the past several decades. Currently, approximately two thirds of all mothers with children younger than 18 years are employed. Most families with young children depend on child care, and most child care is not of good quality. Reliance on child care involves longer days for children and families, the stress imposed by schedules and created by transitions, exposure to infections, and considerable cost. An increasing number and proportion of parents are also devoting time previously available to their children to the care of their own parents. The so-called "sandwich generation" of parents is being pulled in multiple directions. The amount and use of family time also has changed with a lengthening workday, including the amount of commuting time necessary to travel between work and home, and with the intrusion of television and computers into family life. In public opinion polls, most parents report that they believe it is more difficult to be a parent now than it used to be; people seem to feel more isolated, social and media pressures on and enticements of their children seem greater, and the world seems to be a more dangerous place.

Social and public policy has not kept up with these changes, leaving families stretched for time and stressed to cope and meet their responsibilities. What can and what should pediatrics do to help families raise healthy and well-adjusted children? How can individual pediatricians better support families?

Family Pediatrics The American Academy of Pediatrics (AAP) Board of Directors appointed the Task Force on the Family to help guide the development of public policy and recommend how to assist pediatricians to promote well-functioning families (see Appendix). The magnitude of the assigned work required task force members to learn a great deal from research and researchers in the fields of social and behavioral sciences. A review of some critical literature was completed by a consultant to the task force and accompanies this report. That review identified a convergence of pediatrics and research on families by other disciplines. The task force found that a great deal is known about family functioning and family circumstances that affect children. With this knowledge, it is possible to provide pediatric care in a way that promotes successful families and good outcomes for children. The task force refers to that type of care as "family-oriented care" or "family pediatrics" and strongly endorses policies and practices that promote the adoption of this 2-generational approach as a hallmark of pediatrics.

During the past decade, family advocates have successfully promoted family-centered care, "the philosophies, principles and practices that put the family at the heart or center of services; the family as the driving force." Most pediatricians report that they involve families in the decision

making regarding the health care of their child and make an effort to understand the needs of the family as well as the child. Family pediatrics, like family-centered care, requires an active, productive partnership between the pediatrician and the family. But family pediatrics extends the responsibilities of the pediatrician to include screening, assessment, and referral of parents for physical, emotional, or social problems or health risk behaviors that can adversely affect the health and emotional or social well-being of their child.

Family Context of Child Health The power and importance of families to children arises out of the extended duration for which children are dependent on adults to meet their basic needs. Children's needs for which only a family can provide include social support, socialization, and coping and life skills. Their self-esteem grows from being cared for, loved, and valued and feeling that they are part of a social unit that shares values, communicates openly, and provides companionship. Families transmit and interpret values to their children and often serve as children's connection to the larger world, especially during the early years of life. Although schools provide formal education, families teach children how to get along in the world.

Often, efforts to discuss families and make recommendations regarding practice or policy stumble over disagreements about the definition of a family. The task force recognized the diversity of families and chose not to operate from the position of a fixed definition. Rather, the task force, which was to address pediatrics, decided to frame its deliberations and recommendations around the functions of families and how various aspects of the family context influence child rearing and child health.

One model of family functioning that implicitly guided the task force is the family stress model (Fig 1). Stress of various sorts (eg, financial or health problems, lack of social support, unhappiness at work, unfortunate life events) can cause parents emotional distress and cause couples conflict and difficulty with their relationship. These responses to stress then disrupt parenting and the interactions between parent and child and can lead to short-term or lasting poor outcomes. The earlier these events transpire and the longer that the disruption lasts, the worse the outcomes for children. The task force favors efforts to encourage and support marriage yet recognizes that every family constellation can produce good outcomes for children and that none is certain to yield bad ones. Unequivocally, children do best when they are living with 2 mutually committed and loving parents who respect and support one another, who have adequate social and financial resources, and who are actively engaged in the upbringing of their children.

Conclusions From its discussions with family experts, its review of research literature, and its own intensive discussions, the task force was able to draw about the American family a limited number of conclusions that are relevant to pediatrics. Two overriding conclusions were apparent. First, children's outcomes—their physical and emotional health and their cognitive and social functioning—are strongly influenced by how well their families function. Second, there is much that practicing pediatricians can do to help nurture and support families and, thus, promote optimal family functioning and children's outcomes.

Other conclusions were organized into 4 categories: 1) family function and structure, 2) family circumstances, 3) pediatric practice, and 4) policy. Within the first category, there are conclusions about the effect of family structure, values, beliefs, roles, and relationships on child

rearing and child outcomes. The second category, family circumstances, summarizes information on the emotional climate within and outside the home that can promote or impede children's healthy development. Third, to provide appropriate care for children, pediatricians must expand their practices to encompass the assessment of family relationships, health, and behaviors. They must have the skills and comfort to inquire and learn about individual families, address family issues realistically, and link families to support groups and community resources. Pediatricians' ability to practice family pediatrics is influenced by training, personal experience and orientation, the work environment, and professional relationships. Finally, there is a need to develop policies that support reimbursement of pediatricians for services for families; that acknowledge the importance of marriage, parenting, and families for children; and that set clear expectations for parents while providing opportunities for them to obtain desired support.

Recommendations The task force intended that its recommendations follow logically from the conclusions it was able to draw. The scope of family issues that were reviewed and discussed was very wide; consequently, in some cases, the conclusions are broad and the associated recommendations are numerous. The 80 recommendations also were organized into 4 categories to facilitate their consideration by individual physicians and various bodies within the pediatric profession. The first category, education, offers suggestions on family content for resident training and for continuing education for practitioners. It also contains some guidance on priority topics that should be addressed by parent education materials published by the AAP.

The second category, policy and advocacy, suggests public policy positions that would support families and promote good child outcomes. It also addresses reimbursement policies, including diagnostic and procedure coding, which could enable pediatricians to practice family pediatrics. Some suggestions for internal AAP policies that would highlight the importance of a family orientation for the organization also are provided. Finally, opportunities are identified for the AAP to promote local and national policies and activities that support and strengthen families through its chapters and its relationships with other professional organizations.

The third and most extensive category comprises recommendations about pediatric practice. This category includes suggestions for how pediatricians can modify their practice behaviors to promote good family functioning and effective parenting. Included are recommendations for how pediatricians can help strengthen parental partnerships in different family types, screen for family circumstances that put children at risk, and help create family-friendly practice environments. For additional guidance, some characteristics of a family-friendly pediatrician are listed in the final table of the report.

The final category makes recommendations for research that the AAP should encourage or undertake to better enable pediatricians to provide family-oriented care. Areas for research include the mechanics, content, and effectiveness of family-oriented pediatrics practice; public policies and programs that promote family functioning and family-oriented care; and progress toward adopting the principles and content of family pediatrics among health care organizations, insurers, and AAP members.

Taken as a whole, the recommendations provide a comprehensive plan for the AAP and pediatricians to assist families to function well and meet the needs of their children. The scope of

work that is required is extensive and touches on nearly every aspect of the work done by the organization. It also requires modifications in pediatric practices to accommodate changes in the characteristics and circumstances of families that are served.

Next Steps to Ensure Implementation The task force report is only the first step in what needs to be an ongoing process to ensure that children's health care is effectively provided in the context of their families. Attention to families should become integrated into the work of the AAP. This report should be reviewed and discussed by AAP staff, committees, sections, and members to determine which recommendations apply to their work and to plan strategies for their implementation. A single entity needs to take ongoing responsibility for monitoring and promoting activities related to the task force's recommendations. These responsibilities should be assigned with high priority to a standing committee of the AAP.

Screening for Developmental Delay

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According to the literature, 12 to 16 percent of children in the United States have at least one developmental delay, yet as many as one-half of affected children will not be identified by the time they enter kindergarten. If developmental delays are detected too late, opportunities for early intervention may be lost. Empirical literature on clinical recommendations for developmental delay screening in primary care is inconsistent and often insufficient to direct the family physician. In addition, multiple barriers exist, which often prevent physicians from performing initial screening and completing additional evaluation and referrals. Implementing office-based systems for screening and referrals may overcome these barriers and improve outcomes. Recent studies support the use of a validated screening tool at regular, repeated intervals, in addition to physician surveillance, at all well-child visits. The literature also supports screening for developmental delay with parent-completed tools rather than directly administered tools. The most extensively evaluated parent-completed tools are the Parents' Evaluation of Developmental Status and the Ages and Stages Questionnaire. Family physicians should be familiar with currently available screening tools, as well as their limitations and strengths. Additional evaluations and referrals are recommended if developmental delay is identified or suspected.

Providing high-quality care for young patients can be challenging, especially identification of possible developmental delay. Twelve to 16 percent of children in the United States have at least one developmental delay,^{1,2} but early detection is complicated by conflicting national screening recommendations.

The U.S. Preventive Services Task Force (USPSTF) reports that there is insufficient or inconsistent evidence to recommend for or against routine use of brief, formal screening instruments in primary care to detect speech and language delay in children up to five years of age.^{3,4} The recommendation is not a statement for or against the effectiveness of formal screening, but a conclusion of the current state of strong evidence to support specific clinical preventive services. The American Academy of Family Physicians agrees with the USPSTF's rigorous assessment of empirical evidence.⁵ The American Academy of Pediatrics recommends surveillance at all well-child visits, combined with standardized screening for developmental delay at nine, 18, and 30 (or 24) months of age, as well as at every well-child visit when developmental delay is suspected.⁶ This policy is intended to disseminate clinical preventive service recommendations based on empirical and clinical evidence revealing either clear benefits or harm.⁷

Because subtle disabilities such as language impairment, mild intellectual disabilities, and learning disabilities are associated with poorer health status and higher rates of school failure, in-grade retention, and special education, early intervention is generally thought to improve outcomes.^{8–10} Based on evidence from controlled studies, early intervention for premature infants, low-birth-weight infants, and children from families with low socioeconomic status has been shown to improve IQ and result in higher academic achievement, increased adult employment, and decreased criminality.^{8,11} If developmental delays are detected too late, however, opportunities for early intervention may be lost.^{12,13} The USPSTF states that it is ultimately the responsibility of the physician to seek out and address parental concerns about speech delays.³

The Individuals with Disabilities Education Act Amendments of 1997 and Title V of the Social Security Act mandate that health care professionals provide early identification and intervention for developmental delays within community-based collaborative systems.^{6,13,14} In 2005, the Centers for Disease Control and Prevention recommended the use of a brief developmental assessment to identify children who should receive more intensive diagnosis or evaluation.¹³ More quality research is needed to establish consistent clinical recommendations for primary care.

SORT: KEY RECOMMENDATIONS FOR PRACTICE

View Table

Surveillance vs. Screening

As many as one-half of American children with developmental delay will not be identified by the time they enter kindergarten, even though most will show mild developmental delays by two years of age.^{12,15} One reason for low detection rates is high dependence on clinical surveillance alone. Surveillance methods such as checklists and clinical observation have poor sensitivity.¹² Reports show that clinical judgment alone is inadequate and insensitive.⁸ One study revealed that physician impression alone would have missed 45 percent of children eligible for early intervention.¹⁶ Because children's development is dynamic in nature, regular and repeated screening combined with surveillance is needed to detect developmental delays.^{6,12}

Barriers to Screening

Developmental delay can be identified with reasonable accuracy using a screening tool,⁸ yet only 23 percent of primary care clinicians report using standardized screening tools.¹ Multiple barriers to screening exist, including time constraints, competing clinical demands, cost burden, staffing requirements, lack of consensus on the most suitable tools for the general childhood population, and lack of physician confidence because of insufficient training and expertise.^{1,2,9,17} Additional barriers noted in a recent study were high staff turnover, unequal distribution of screening tools, and lack of reimbursement for the 30-month visit.¹⁸ In one study, 82 percent of primary care clinicians cited ongoing time constraints as the most prominent barrier.¹⁹

Tools for Developmental Screening

The literature does not identify a criterion standard in developmental assessment, other than the lengthier screening test performed after a referral has been made.¹² Criterion standard is defined as an ideal test that covers all areas of development, is equally applicable to all ages, has construct validity, and has a sensitivity and specificity close to 100 percent.²⁰ No universally accepted screening tool is recommended as appropriate for all populations and ages.⁶ The function of a screening tool is to identify areas in which children's development differs from established norms for age.⁶ Although its purpose is to differentiate those who might have a delay from those who most likely do not, the selected tool should be a quality instrument that is as accurate as possible to minimize underdetection and overreferrals.¹² There are no randomized studies of contemporary tools that compare children who have been screened with those who have not.⁸ [Table 1](#) lists the limitations and strengths of available developmental delay screening tools to assist family physicians in choosing the best one for their patient population.^{6,8,12,17,19–26}

Table 1. Practical Applicability in the Office: Factors to Consider in Choosing the Appropriate Developmental Delay Screening Tool

[View Table](#)

PSYCHOMETRICS

Sensitivity, specificity, and validity are measures that reflect the accuracy and potential usefulness of a particular tool. [Table 2](#) compares psychometric values for developmental delay screening tools.^{6,8,12,20,21,23,26–28} When looking specifically at developmental delay, sensitivity is defined as the percentage of children with true delays who are correctly identified by the screening tool.¹² The accepted sensitivity in this area is 70 to 80 percent. Specificity is defined as the percentage of children without delays who are correctly classified by the screening tool.¹² Higher specificities result in fewer overreferrals. The accepted standard for specificity is approximately 80 percent.¹²

Table 2. Comparison of Common Developmental Delay Screening Tools

View Table

A good developmental screening tool is standardized on a large sample of children with characteristics that represent the general population. Because no developmental screening tool does a great job of accurately classifying children with and without delay, it is common for only one out of three referred children to actually have a developmental delay diagnosis.¹² The accuracy of the tool also depends on the population to which it is applied.¹⁶ As physicians transition to electronic health records, it is important to know if the embedded tools are valid, because shortened versions degrade validity and reliability.

PARENT-COMPLETED VS. DIRECTLY ADMINISTERED TOOLS

There are two types of formal developmental screening tools: direct observation in conjunction with parent report (known as directly administered) and those based on parent report alone (known as parent completed). Directly administered screening tools, which provide more in-depth information and take longer to complete, are useful as second-stage screening tools. They are best used in a setting in which there is time given to work individually with patients.

Parent-completed tools are an effective way to screen for developmental delay.²⁹ They are feasible and easy to use in busy primary care offices,^{12,18,30} and are more time efficient and practical in this setting than directly administered tools.^{12,16} Parents can complete them while they wait for their appointment or, if sent by mail, before the appointment. If there is a literacy problem, they can also be completed via interview.¹² Several of these tools are valid and have a sensitivity and specificity similar to those of directly administered tools.^{1,8}

The cost of parent-completed screening tools has also been studied, and they have been found to be less expensive than directly administered tools for both negative and positive screening results.^{8,17,25} These tools meet two important elements of the patient-centered medical home: they engage parents as active participants in their child's health and facilitate the parent-child-physician relationship. Parent-completed screening tools can reduce cost and increase time efficiency.

SPECIFIC TOOLS

Two of the most extensively evaluated parent-completed tools are the Parents' Evaluation of Developmental Status (PEDS) and Ages and Stages Questionnaire (ASQ). The PEDS tool has eight yes/no questions and two open-ended questions written at a fourth-to fifth-grade reading level. It takes two minutes for the parent to complete and, if it is read to the parent, it takes five minutes to complete. The PEDS tool can be done in the office while waiting or at home before the visit. An electronic version that can be integrated into the electronic health record is available online at <http://www.pedstest.com>.

For all ages combined, the PEDS tool has a sensitivity of 75 percent and a specificity of 74 percent.⁸ Its validity was measured by comparing it with the Woodcock-Johnson Psychoeducational Battery: Tests of Achievement, Stanford-Binet Intelligence Scale, and Bayley Scales of Infant Development II.⁸ Psychometric properties are maintained across parental

education level, socioeconomic status, and childrearing experience.⁸ There is no true numeric scoring¹⁹; children are instead placed in low-, medium-, and high-risk categories. In general, children found to be at medium or high risk require referral for further testing. In one study of urban pediatric clinics, physicians identified developmental problems more accurately and earlier in the visit after implementing use of the PEDS tool. The physicians also reported that by using the tool, the efficiency of their visits and appropriate follow-up care improved.³⁰

The ASQ, third edition, has a series of 21 age-specific questionnaires starting at one month and ending at five and a half years of age. Five developmental domains are evaluated (i.e., fine motor; gross motor; language and communication; problem-solving/adaptive behavior; and personal/social performance), with six items to query skills in each area. In addition, a section comprised of 10 questions assesses general parental concerns. There is a pass/fail score to measure each domain, as well as an overall pass/fail score. It is written at a fourth-to sixth-grade reading level. It takes 10 to 15 minutes for parents to complete; if interviewer assistance is needed, it takes 20 minutes to complete. It also takes one to five minutes to score.⁸ The ASQ was originally designed to be completed at home before the visit, but it can also be done in the office while waiting. The ASQ, third edition, is available online at <http://agesandstages.com>.

Overall specificity of the ASQ, third edition, is 86 percent, with an average sensitivity of 85 percent.²¹ Its validity was measured by comparing it with the Battelle Developmental Inventory.²⁷ Test-retest and inter-rater reliability are strong ($r = 0.94$).¹⁹ Studies looking at implementation of the ASQ in busy health care settings found it to be feasible, to have a low cost, and to not impede office flow.^{18,31,32} Some primary care clinics preferred using the ASQ because it aligned well with screenings already used in local outreach or early intervention programs.¹⁸ The ASQ-Social-Emotional (ASQ-SE) is also available to evaluate social and emotional competence, but is beyond the scope of this article.

Office Implementation

OVERCOMING BARRIERS TO SCREENING

A consistent screening and referral system can be implemented to address and overcome many screening barriers. The North Carolina Assuring Better Child Health and Development Project, a quality improvement initiative, showed improved efficiency by replacing existing processes with the use of the PEDS tool or ASQ.²⁵ The Enhancing Developmentally Oriented Primary Care Project, a three-year Illinois collaborative, showed significant increases in screening when using the ASQ.³³

EVALUATION AND REFERRAL

When a developmental delay is suspected or identified with a screening tool, further evaluation is necessary. Several studies show inconsistent evaluation and referral patterns among physicians.^{18,34} Inconsistency can hinder identification and impede possible improvement in outcomes. Therefore, it is imperative that a detailed developmental assessment and a comprehensive medical evaluation be scheduled in a timely manner, along with a referral for early developmental intervention/early childhood services.⁶ [Table 3](#) lists evaluation tests and

services, as well as referral options for specialists and programs.^{6,12} The family physician, as part of the patient-centered medical home, is integral to the process of coordinating the evaluations and authorizing referrals. As primary care offices become patient-centered medical homes and the systems of screening and referrals are improved, the gap in evidence linking screening and outcomes may close.

Table 3. Recommendations for Further Evaluation and Referral in Children with Possible Developmental Delay

View Table

Data Sources: A PubMed search was completed using the key terms developmental delay and screening tools. A separate search was completed using the key terms Parent Evaluation of Developmental Status and Ages and Stages Questionnaire. The search included meta-analyses, randomized controlled trials, clinical trials, and reviews. Also searched were the Agency for Healthcare Research and Quality evidence reports, the Canadian Task Force on Preventive Health Care, the Cochrane database, Database of Abstracts of Reviews of Effects, the Institute for Clinical Systems Improvement, the National Guideline Clearinghouse database, U.S. National Library of Medicine, and the U.S. Preventive Services Task Force. Search dates: March 1, 2009 through September 30, 2010.

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REFERENCES

1. Rydz D, Srour M, Oskoui M, et al. Screening for developmental delay in the setting of a community pediatric clinic: a prospective assessment of parent-report questionnaires. *Pediatrics*. 2006;118(4):e1178–e1186.
2. Oberklaid F, Efron D. Developmental delay—identification and management. *Aust Fam Physician*. 2005;34(9):739–742.
3. U.S. Preventive Services Task Force. Screening for speech and language delay in preschool children: recommendation statement. Rockville, Md.: Agency for Healthcare Research and Quality; 2006. <http://www.uspreventiveservicestaskforce.org/uspstf/uspshdv.htm>. Accessed June 27, 2011.
4. Law J, Garrett Z, Nye C. The efficacy of treatment for children with developmental speech and language delay/disorder: a meta-analysis. *J Speech Lang Hear Res*. 2004;47(4):924–943.
5. American Academy of Family Physicians. Summary of recommendations for clinical preventive services. February 2011. http://www.aafp.org/online/etc/medialib/aafp_org/documents/clinical/CPS/rcps08–2005.Par.0001.File.tmp/June2010.pdf. Accessed June 27, 2011.
6. Council on Children With Disabilities; Section on Developmental Behavioral Pediatrics; Bright Futures Steering Committee; Medical Home Initiatives for Children With Special Needs Project Advisory Committee. Identifying infants and young children with developmental disorders in the medical home: an algorithm for developmental surveillance and screening [published correction appears in *Pediatrics*. 2006;118(4):1808–1809]. *Pediatrics*. 2006;118(1):405–420.
7. American Academy of Pediatrics Steering Committee on Quality Improvement and Management. Classifying recommendations for clinical practice guidelines. *Pediatrics*. 2004;114(3):874–877.
8. Hamilton S. Screening for developmental delay: reliable, easy-to-use tools. *J Fam Pract*. 2006;55(5):415–422.
9. Nelson HD, Nygren P, Walker M, Panoscha R. Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force [published correction appears in *Pediatrics*. 2006;117(6):2336–2337]. *Pediatrics*. 2006;117(2):e298–e319.
10. Buschmann A, Jooss B, Rupp A, et al. Parent based language intervention for 2-year-old children with specific expressive language delay: a randomised controlled trial. *Arch Dis Child*. 2009;94(2):110–116.

11. Stebbins H, Knitzer J. State early childhood policies. National Center for Children in Poverty; June 2007. http://www.nccp.org/publications/pub_740.html. Accessed June 27, 2011.
12. Glascoe FP. Screening for developmental and behavioral problems. *Ment Retard Dev Disabil Res Rev*. 2005;11(3):173–179.
13. Centers for Disease Control and Prevention. Child development: Using developmental screening to improve children's health. <http://www.cdc.gov/ncbddd/child/improve.htm>. Accessed June 27, 2011.
14. Illinois State Board of Education. Individuals with Disabilities Education Act Amendments of 1997 (IDEA). <http://www.isbe.state.il.us/SPEC-ED/html/idea.htm>. Accessed June 27, 2011.
15. Brothers KB, Glascoe FP, Robertshaw NS. PEDS: developmental milestones—an accurate brief tool for surveillance and screening. *Clin Pediatr (Phila)*. 2008;47(3):271–279.
16. Aylward GP. Developmental screening and assessment: what are we thinking? *J Dev Behav Pediatr*. 2009;30(2):169–173.
17. Dobrez D, Sasso AL, Holl J, Shalowitz M, Leon S, Budetti P. Estimating the cost of developmental and behavioral screening of preschool children in general pediatric practice. *Pediatrics*. 2001;108(4):913–922.
18. King TM, Tandon SD, Macias MM, et al. Implementing developmental screening and referrals: lessons learned from a national project. *Pediatrics*. 2010;125(2):350–360.
19. Rydz D, Shevell MI, Majnemer A, Oskoui M. Developmental screening. *J Child Neurol*. 2005;20(1):4–21.
20. Weiss LG, Oakland T, Aylward GP. Bayley-III Clinical Use and Interpretation. Boston, Mass.: Academic; 2010.
21. Ages & Stages Questionnaires. Comparison chart of screeners. <http://agesandstages.com/asq-products/asq-3/comparison-chart-of-screeners/>. Accessed June 27, 2011.
22. PEDSTest.com. Parents' Evaluation of Developmental Status (PEDS). <http://www.pedstest.com/LearnAboutPEDS/IntroductiontoPEDS.aspx>. Accessed June 27, 2011.
23. Behavior Science Systems, Inc. Child development review: Screening and assessing the development of young children using parent report and professional observations. <http://www.childdevrev.com>. Accessed June 27, 2011.
24. Moore KJ. Coding & documentation. Answers to your questions. *Fam Pract Manag*. 2002; 9(2): 22. <http://www.aafp.org/fpm/2002/0200/p22.html>. Accessed June 27, 2011.

25. Earls MF, Hay SS. Setting the stage for success: implementation of developmental and behavioral screening and surveillance in primary care practice—the North Carolina Assuring Better Child Health and Development (ABCD) Project. *Pediatrics*. 2006;118(1):e183–e188.
26. Feightner JW. Chapter 26: Preschool screening for developmental problems. In: Canadian Task Force on Periodic Health Examination. The Canadian Guide to Clinical Preventive Health Care. Ottawa, Ontario, Canada: Health Canada; 2006: 290–296. <http://www.phac-aspc.gc.ca/publicat/clinic-clinique/pdf/s2c26e.pdf>. Accessed June 27, 2011.
27. Squires J, Twombly J, Bricker D, Potter L. ASQ User's Guide. Baltimore, Md.: Paul H. Brookes Pub.; 2009.
28. Sices L, Stancin T, Kirchner L, Bauchner H. PEDS and ASQ developmental screening tests may not identify the same children. *Pediatrics*. 2009;124(4):e640–e647.
29. Nicol P. Using the Ages and Stages Questionnaire to teach medical students developmental assessment: a descriptive analysis. *BMC Med Educ*. 2006; 6: 29. <http://www.biomedcentral.com/1472-6920/6/29>. Accessed June 28, 2010.
30. Schonwald A, Huntington N, Chan E, et al. Routine developmental screening implemented in urban primary care settings: more evidence of feasibility and effectiveness. *Pediatrics*. 2009;123(2):660–668.
31. Hix-Small H, Marks K, Squires J, Nickel R. Impact of implementing developmental screening at 12 and 24 months in a pediatric practice. *Pediatrics*. 2007;120(2):381–389.
32. Marks K. Should general pediatricians not select the Ages & Stages-Questionnaire in light of the Rydz et al study? *Pediatrics*. 2007;120(2):457–458; author reply 458, discussion 459.
33. Allen SG, Berry AD, Brewster JA, et al. Enhancing developmentally oriented primary care: an Illinois initiative to increase developmental screening in medical homes. *Pediatrics*. 2010;126(suppl 3):S160–S164.
34. Sices L, Feudtner C, McLaughlin J, et al. How do primary care physicians manage children with possible developmental delays? A national survey with an experimental design. *Pediatrics*. 2004;113(2):274–282.