Screening for behavioral health problems in primary care
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Purpose of review
The epidemiology of behavioral health disorders in children and the current literature on the identification of these problems within primary care are reviewed. Suggestions are offered on how to implement screening within primary care settings.

Recent findings
The prevalence of behavioral health problems in children is approximately 12–27% yet the detection of these problems within the primary care setting is much lower. Although identification may be improving, underidentification and limited referral for services remain a significant problem. Few physicians use standardized instruments or DSM-IV criteria to identify children. Families, in addition, often do not disclose behavioral health concerns about their child to their physician. Multiple barriers exist for successful screening, including lack of training, limited time and poor reimbursement. Recent evidence suggests that a number of well validated instruments are now available for behavioral health screening within primary care.

Summary
Pediatric settings hold the potential to be an optimal environment to address behavioral health concerns due to the frequent contact and trusted relationship many families have with their pediatrician. There is new evidence that screening can be thoughtfully implemented and that system change around the detection of behavioral health problems is possible.

Keywords
behavioral health, mental health, primary care, screening

Introduction
The high prevalence of behavioral health disorders in children of all ages and the lack of recognition and treatment of these disorders have forced the medical profession to examine this disparity and to identify new approaches to meet children’s mental health needs more fully. Furthermore, the lack of available mental health services for children in this country has placed increasing pressure on pediatricians to recognize and treat children with a range of behavioral health disturbances. Conceptually, pediatric settings are an optimal environment to detect and address behavioral health concerns and disorders because up to 50% of all pediatric office visits address some behavioral, psychosocial, and/or educational concerns [1], and approximately 75% of children with psychiatric problems are seen within primary care settings [2].

The epidemiology of behavioral health disorders in children and the current literature on the identification of behavioral health problems within primary care settings are here reviewed. In addition, we discuss the strategies and tools for screening children for behavioral health disorders, while accounting for some of the challenges and barriers that currently exist.

Epidemiology
The prevalence of psychopathology in children and adolescents is approximately 12–27% [1,2,3,4,5]. These prevalence rates vary depending on the population examined; for example, higher rates of behavioral health disorders have been identified in disadvantaged populations. In a recent report by Costello et al. [6,7] that examined a large, longitudinal cohort of children between ages 9 and 16 (Great Smoky Mountains Study – GSMS), the 3-month prevalence for any behavioral health disturbance was 13.3%, and 6.8% of these cases represented a serious emotional disturbance. Cumulative prevalence revealed that by age 16 years, fully 36.7% of children had met DSM-IV criteria for one or more disorders. Boys had a greater likelihood of having a disorder, and this was primarily attributed to a higher prevalence of both conduct disorders and attention-deficit/hyperactivity disorder (ADHD). Girls had significantly higher rates of depression and anxiety disorders.

In the GSMS, when the prevalence rates for behavioral health disorders were examined by age, there appeared to be two different ages of expression of behavioral health disorders. During each age group, different behavioral health problems predominated. The highest prevalence...
for any behavioral health disturbance was in 9–10-year olds and the lowest prevalence was found in 12-year olds. As the prevalence of early childhood disorders decreased, rates of adolescent behavioral problems began to rise after age 12. Early childhood disturbances included diagnoses such as ADHD, separation anxiety disorder, oppositional defiant disorder, enuresis, and encopresis. Adolescent behavioral health issues included depression, social phobia, substance use disorders, and generalized anxiety disorders. Conduct disorders tended to be expressed first in the earlier age group, with 75% having symptoms before age 10 and 89% before age 13. Early-onset behavioral health disorders tended to be more male-predominant, while the adolescent disorders tended to have a greater representation of females.

Overall, the prevalence rates for childhood-onset behavioral health disorders have been estimated to be as follows: ADHD (9% for boys, 3% for girls depending on the diagnostic criteria used), anxiety disorders (9%), depression (2% for school-aged children, 5% for young adolescents and 8% for older adolescents), and conduct disorder (6–16% for boys and 2–9% for girls depending on the population examined and the criteria used) [1,6*,8]. Results from more recent studies suggest that these values may be inflated and accurate population estimates may be lower than previously reported in cross-sectional studies [6*].

Comorbidity is an important issue to consider when examining the prevalence of behavioral health disorders. In the GSMS report, 25.5% of children with a diagnosis had two or more diagnoses. The strong association between ADHD and Oppositional Defiant Disorder and between Anxiety and Depression primarily accounted for these rates. These high rates of comorbidity and the associations between specific diagnoses have been confirmed in multiple studies [1,8] and have important implications for screening and identification of behavioral health disorders.

Preschoolers represent another important group where there is growing awareness of significant behavioral health issues. Prevalence rates of behavioral health problems have been estimated to range from 7 to 24% [9]. Diagnostic categories reflect a developmental continuum and, in addition to behavioral health disorders noted earlier, include other diagnoses such as relational disturbances (e.g., parent–child difficulties and attachment problems) and regulatory problems, such as eating and sleeping disturbances.

**Identification of behavioral health disorders within pediatric practices**

Multiple studies have demonstrated that pediatricians significantly underidentify children with behavioral health disorders [1,2,4,10–12]. In contrast to the epidemiological prevalence rates for behavioral health disorders in children, pediatric providers have been reported to identify approximately 4–17% of children with such disturbances [3*,10]. Studies have indicated that 55–82% of parents who reported problematic behaviors or concerns about their child’s behavior as part of a research protocol did not discuss these concerns with their pediatric provider [1,4,12,13]. Detection rates were lowest when the physician used no standardized screening instrument to aid in the identification of children with behavioral health problems [14]. Pediatricians tend to use DSM-IV criteria and standardized measures most often when screening for ADHD [15,16*], but overall, physicians used DSM criteria or standardized tools in only 23% of visits where psychosocial problems were recognized. Not surprisingly, physicians’ ability to detect child behavior health problems increased substantially when parents reported concerns to the clinician during the visit [12].

Recent studies from the Netherlands, though, contrast with some of these findings and report that physicians do detect psychosocial problems in 25% of school-aged children presenting for pediatric visits [11]. Physicians in this study, however, seem to have detected different problems from those reported by parents when they completed the Child Behavior Checklist (CBCL) about their children’s behaviors. For example, pediatric providers failed to detect psychosocial problems in 71% of toddlers and 43% of school-aged children who were in the clinical range on the CBCL as reported by parents [10,11].

Additional evidence for improved detection comes from a recent comparison of data collected in 1979 and 1996. These data suggest that, since 1979, there has been a trend towards increased identification of children with behavioral health problems. Clinicians substantially increased the detection of behavioral health problems during pediatric visits from 6.8% in 1979 to 18.7% in 1996. The detection of attentional problems showed the greatest increase [5]; this increase is probably because physicians report high levels of comfort in making the diagnosis of ADHD [2]. In contrast to the increased detection of ADHD, the identification of children with mood/anxiety disorders is low even when physicians identify high rates of psychosocial problems [17]. Limited recent literature suggests that pediatricians are developing increased comfort levels in making the diagnosis of anxiety and depression and that they have more confidence in the psychopharmacologic management of these conditions [2]. This literature, however, reflects practice patterns in a narrow geographical region and may not reflect national trends.
manage depression and anxiety, and this correlates with lower rates of detection for these problems. Physicians’ reluctance to diagnose children was due to diagnostic uncertainty, concern about comorbid conditions and hesitation to make a diagnosis that they believed parents were not ready to accept. In a small survey of physicians, although the vast majority felt prepared to discuss psychosocial issues with parents, only 14% felt they had enough time to do this, and 100% felt they were not adequately reimbursed for these efforts [20].

There is a recent report from the Assuring Better Child Health and Development Project (ABCD) in North Carolina describing their experience in successfully implementing statewide developmental and behavioral screening [21*]. Table 2 describes ‘pearls’ based on their experience. One of their key reasons for success was utilizing a PDSA cycle (plan, do, study, act) to assess the implementation of initiatives and make modifications where they were needed. For a practice to implement successful screening procedures, there will be ‘front-end’ work, but the fruits of this investment in time can be greater efficiency during visits, greater parent and physician satisfaction, stronger community partnerships and improved detection of children with behavioral health problems.

Choosing standardized screening measures
When considering implementing a screening strategy, a number of issues need to be addressed by the clinician and the practice to ensure success. In a recent report discussing screening for behavioral and developmental problems in young children, Bergman described a 10-point checklist that has been modified for this paper and that can be used to select and critique screening tools (Table 3) [19]. It is important for pediatricians to keep in mind the distinction between a screening measure, whereby a large number of asymptomatic individuals are tested for a particular problem, and an assessment measure that is designed to help practitioners determine with greater certainty the degree of impairment, the nature of the condition and whether the child identified in a screen could benefit from an intervention [19].

### Table 1 Barriers to screening

<table>
<thead>
<tr>
<th>Barriers to screening</th>
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<tbody>
<tr>
<td>Limited training of physicians</td>
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<td>Limited time</td>
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<td>Poor reimbursement</td>
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<tr>
<td>Reluctance to label children by pediatrician</td>
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<tr>
<td>Lack of disclosure by parent</td>
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<td>Limited access to mental health services</td>
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<td>Limited knowledge of community resources</td>
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<td>Lack of office strategies to integrate screening into well child visits</td>
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### Importance of early detection of behavioral health problems in children

In addition to the importance of identifying children with behavioral health problems so they can receive appropriate interventions, there is also mounting evidence that early identification and treatment of clinical and subclinical behavioral health problems may avert the unfolding of significant mental health problems in adulthood. For example, chronic low-grade dysthymia in childhood has been recognized as a ‘gateway disorder’ to major depression or bipolar disorder later in life [1]. There is also clear evidence that some adult mental health problems begin in childhood. For example, a cohort of children who have been followed since birth in New Zealand has begun to show that in individuals with a psychiatric diagnosis at age 26, three-quarters had a diagnosis by age 18 and one-half had one by age 15 [6**,18].

### Barriers to screening

A number of barriers (Table 1) to successful screening of children for behavioral health disturbances within pediatric practice have been identified [3**,9,19]. In one study, pediatricians surveyed reported that they had a lack of training in behavioral health problems during residency, and when asked in which areas of behavioral health they received the best training, 57% reported none [2]. Most physicians who reported none, however, had been in practice for more than 5 years, while more recent graduates reported higher levels of training in behavioral health disorders, with the greatest emphasis on ADHD. Physicians felt least prepared to

### Table 2 Screening implementation ‘pearls’

<table>
<thead>
<tr>
<th>Screening implementation ‘pearls’</th>
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<tr>
<td>Identify a physician champion who will maintain this initiative as a priority</td>
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<td>Map practice workflow to determine who will be responsible for each task and when</td>
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<td>Train all office staff who will have any involvement with the screening</td>
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<tr>
<td>Identify community partners (mental health and early intervention providers, agencies that provide family support) and establish logistics of communication and referral</td>
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<tr>
<td>Identify and obtain existing educational materials (handouts, existing curricula, on-line presentations for families and physicians, posters) and available CME programs (on-line, chapter AAP, and national Developmental-Behavioral Pediatrics review course)</td>
</tr>
<tr>
<td>Before beginning screening, consult with parents and obtain their feedback at regular intervals</td>
</tr>
<tr>
<td>Plan at the onset for regular staff meetings to review progress and identify challenges</td>
</tr>
<tr>
<td>Pilot screening before practice-wide implementation</td>
</tr>
<tr>
<td>Collect data on the number of completed and uncompleted screens and use information to troubleshoot and improve workflow</td>
</tr>
<tr>
<td>Consider creating an office resource guide that includes community support information and how-tos for implementation of screening</td>
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Simonian advocates using a two-tiered approach to the identification of children: the first level would be a broad, brief and cost-effective measure to screen and, if the screen is positive, it would be followed by a more comprehensive, diagnostic evaluation [34]. Clinicians need to establish what their goals are for screening, and these goals will then guide which screening measures are most appropriate for their practice.

**Psychometric considerations**

When choosing instruments for use as part of a screening program, it is important to consider the psychometric properties of the instrument and to use screens only as they were designed. The inappropriate uses of behavioral health measures can lead to high misclassification rates [22]. Important constructs to consider when selecting an appropriate screen include the following.

1. **Reliability:** Is the test consistent between different assessors and over time?
2. **Validity:** Does the test truly capture the domain or construct that it purports to measure? Does it predict an important subsequent outcome? Has it been tested on children similar to children in the pediatric practice where it will be administered?
3. **Sensitivity:** This represents the ability of the screening measure to identify accurately children who truly have the problem.
4. **Specificity:** This represents the ability of the screening measure to identify accurately children without the problem.
5. **Positive Predictive Accuracy:** This represents the likelihood that a child with a positive screen will truly have the behavioral problem.

**Screening tools**

Table 4 lists screening measures to consider for broad screening purposes within a pediatric primary care setting. This table is not meant to be an exhaustive list, and only a sample of well known or high-quality broad-band measures that might be useful for screening a nonreferred, nonidentified population of children is included.

A pediatrician, however, may choose to screen specific children with particular concerns at particular ages rather than screening all children. Many other measures exist to evaluate children for particular behavioral health problems, such as ADHD, anxiety disorders, depression, autism, phobias, etc. For example, the Vanderbilt Assessment Scales have been developed to screen for ADHD within a primary care setting and are available on the American Academy of Pediatrics website. Pediatricians may also choose to screen children with environmental risk factors for behavioral health problems rather than screening all children in a practice.

There is good evidence that identifying emotional health problems of parents and family stressors that may impact on a child’s behavior and development can be done within pediatric settings using screening measures [23–25]. Some of these psychosocial screening measures are included in Table 3.

**Enhancing the utility of screening measures**

Although using standardized screening tools is a potentially efficient and effective way to detect behavioral health disorders, it is not a substitute for obtaining a careful history, engaging parents in a dialogue, assessing symptom severity and functional impairment, and identifying risk factors that may place children at risk of behavioral health problems. These risk factors include poverty, the presence of parental mental health problems, the absence of family cohesion, lack of social support, marital discord, etc. [34,4,5,9,26]. Physicians have not always incorporated the presence of these risk factors into an algorithm to identify behavioral health problems [1,5]. Lastly, it cannot be overemphasized that a trusting, empathic relationship with a pediatrician will enhance parents’ comfort in disclosing concerns about their child and even about their own behavioral health [27].
Table 4 Screening instruments

<table>
<thead>
<tr>
<th>Screening instrument</th>
<th>Domains covered</th>
<th>Respondent</th>
<th>Age range</th>
<th>No. of items/time to complete</th>
<th>Strengths and weaknesses</th>
<th>Utility in pediatric primary care setting</th>
<th>Website (free download or ordering information)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pediatric Symptom Checklist (PSC)</strong> [29]</td>
<td>Behavioral/emotional</td>
<td>Parent</td>
<td>4–16 years</td>
<td>35 items/5–10 min</td>
<td>Has been well studied with good psychometrics</td>
<td>Designed for use in pediatric setting. Shorter versions being developed. Cut-off scores have varied based on population being assessed [14,30,31]</td>
<td><a href="http://www.mgh.harvard.edu/allpsych/PediatricSymptomChecklist/psc_general.htm">http://www.mgh.harvard.edu/allpsych/PediatricSymptomChecklist/psc_general.htm</a> or <a href="http://www.brightfutures.org/mentalhealth/pdf/tools.html">http://www.brightfutures.org/mentalhealth/pdf/tools.html</a></td>
</tr>
<tr>
<td><strong>Behavior Assessment System for Children – Second Edition (BASC-2)</strong> [33]</td>
<td>Behavioral</td>
<td>Parent (teacher and child forms available). Can be used individually or in combination</td>
<td>2 to 21 years</td>
<td>126 items/10–20 min</td>
<td>Good internal consistency and test-retest reliability. Second edition now available</td>
<td>May be too time consuming and complex for mass screening but may have a role in obtaining strong multidimensional assessment</td>
<td><a href="http://ags.pearsonassessments.com/">http://ags.pearsonassessments.com/</a></td>
</tr>
<tr>
<td><strong>Child Behavior Checklist – Revised (CBCL)</strong> [34]</td>
<td>Behavioral/emotional/developmental</td>
<td>Parent</td>
<td>1½–5 years</td>
<td>99 items/20 min</td>
<td>Extensively studied instrument. Now contains Language Development Survey</td>
<td>May be too time consuming for most practices</td>
<td><a href="http://www.aseba.org/products/cbcl1-5.html">http://www.aseba.org/products/cbcl1-5.html</a></td>
</tr>
<tr>
<td><strong>Child Behavior Checklist (CBCL)</strong> [35]</td>
<td>Behavioral/emotional/social</td>
<td>Parent</td>
<td>6–18 years</td>
<td>138 items/20 min</td>
<td>Long considered the ‘gold standard’, Yields a total behavior problem score and T-scores</td>
<td>May be too time consuming for most practices. Scoring can be done on computer but can take 10 min</td>
<td><a href="http://www.aseba.org/products/cbcl8-18.html">http://www.aseba.org/products/cbcl8-18.html</a></td>
</tr>
<tr>
<td><strong>Preschool Feelings Checklist</strong> [37]</td>
<td>Behavioral/emotional</td>
<td>Parent</td>
<td>3–5.6</td>
<td>20 items/2–4 min</td>
<td>Strong focus on depressive symptoms. Needs more validation studies</td>
<td>Easy to administer and score</td>
<td></td>
</tr>
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</table>

(continued overleaf)
<table>
<thead>
<tr>
<th>Screening instrument</th>
<th>Domains covered</th>
<th>Respondent</th>
<th>Age range</th>
<th>No. of items/time to complete</th>
<th>Strengths and weaknesses</th>
<th>Utility in pediatric primary care setting</th>
<th>Website (free download or ordering information)</th>
</tr>
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<tbody>
<tr>
<td>Eyeberg Child Behavior Inventory (CBI) [38]</td>
<td>Behavioral</td>
<td>Parent</td>
<td>2–16 years</td>
<td>36 items/5 min</td>
<td>Sensitivity is 80%, specificity 86%, not available in Spanish</td>
<td>Primarily designed to assess disruptive behaviors and conduct problems. Normed on a broad range of children. Easy to administer and score.</td>
<td><a href="http://www.parinc.com">www.parinc.com</a></td>
</tr>
<tr>
<td>Ages and Stages: Social-Emotional (ASQ:SE) [39]</td>
<td>Behavioral</td>
<td>Parent</td>
<td>6–60 months</td>
<td>10–15 min</td>
<td>Can be photocopied. Can be used alone or with ASQ</td>
<td>Questionnaires correspond with timing of pediatric visits</td>
<td><a href="http://www.agesandstages.com">www.agesandstages.com</a></td>
</tr>
<tr>
<td>Toddler Behavior Screening Inventory [40]</td>
<td>Behavioral</td>
<td>Parent</td>
<td>12–41 months</td>
<td>40 items/10 min</td>
<td>Adequate psychometrics</td>
<td>Specifically designed for physicians to use in well child visits. Normed on a middle class sample</td>
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</table>

**Family Psychosocial Screens**

<table>
<thead>
<tr>
<th>Screening instrument</th>
<th>Domains covered</th>
<th>Respondent</th>
<th>Age range</th>
<th>No. of items/time to complete</th>
<th>Strengths and weaknesses</th>
<th>Utility in pediatric primary care setting</th>
<th>Website (free download or ordering information)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Psychosocial Screening [41]</td>
<td>Family psychosocial risk factors</td>
<td>Parent</td>
<td>N/A</td>
<td>15 min</td>
<td>Sensitivity and specificity reported to be greater than 90%</td>
<td>Can be used as an intake form</td>
<td><a href="http://www.pedsrtest.com/files/fampsych.pdf">http://www.pedsrtest.com/files/fampsych.pdf</a></td>
</tr>
<tr>
<td>Edinburgh Postnatal Depression Scale [42]</td>
<td>Postpartum depression</td>
<td>Parent</td>
<td>N/A</td>
<td>10 items/5 min</td>
<td>Can be downloaded for free. High sensitivity and specificity. Validated in many cultures</td>
<td>Easy to complete and brief</td>
<td><a href="http://dbpeds.org/articles/detail.cfm?TextID=485">http://dbpeds.org/articles/detail.cfm?TextID=485</a></td>
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</table>
Follow-up after screening

Unfortunately, children who have positive screens for behavioral health problems do not always get adequate follow-up. In one study, only 16% of children who screened positive for a behavioral health problem were given a referral for follow-up [19]. In addition, only approximately a half to two-thirds of children who receive a referral from a pediatrician for mental health services actually see a mental health specialist, and only 30% of those children saw the mental health specialist more than once [3“,19]. These data suggest that administering a screening measure is not the end point in detecting behavioral health disorders but, in fact, the beginning of a process to identify such children, to connect them successfully with appropriate assessment and treatment and to monitor and support the child and family over time.

Conclusion

Data suggest that pediatricians have consistently underdiagnosed behavioral health problems in children and that routine, systematic screening does not occur in most pediatric practices. Many barriers exist to implementing effective screening in pediatric practices. There are, however, a number of well validated and reliable instruments available for use within a pediatric primary care setting. If a practice determines its goals for screening and decides who should be screened and at what age, there is evidence that the implementation of screening can be successful. Additional research needs to focus on the identification and treatment of behavioral health disorders in primary care settings but, currently, funding from the NIH directed towards this area is insufficient [28]. More information is still needed in order to effect system change, including information about how to develop effective collaborations with mental health providers, how to implement innovative models of collaborative care, how to interpret screens to make the best use of their results and how to receive adequate financial reimbursement so that pediatricians can successfully meet the behavioral health needs of their patients.

Acknowledgements

We gratefully acknowledge the assistance of Julia Robertson and Carol Coughlin in the preparation of this paper.

References and recommended reading

Papers of particular interest, published within the annual period of review, have been highlighted as:

• of special interest

• of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (p. 682).


3 Simonian S. Screening and Identification in Pediatric Primary Care. Behav Modif 2006; 30:114–131. This well written and comprehensive review article highlights the critical issues related to screening in pediatric primary care settings and reviews key screening instruments.


These studies describe how primary care practices in North Carolina successfully incorporated screening for developmental and behavioral problems.


