Use of Practice Guidelines in the Primary Care of Children With Attention-Deficit/Hyperactivity Disorder

Jerry L. Rushton, MD, MPH*; Kathryn E. Fant, MPH‡; and Sarah J. Clark, MPH‡

ABSTRACT. Objectives. Several guidelines have been published for the care of children with attention-deficit/hyperactivity disorder (ADHD); however, few data describe adoption of practice guidelines. Our study sought 1) to describe primary care diagnosis and management of ADHD, 2) to determine whether the care is in accordance with American Academy of Pediatrics (AAP) practice guidelines, and 3) to describe factors associated with guideline adherence.

Methods. We conducted a mail survey of 1374 primary care physicians in Michigan. Main outcome measures were reported adherence to practices specified in the AAP guidelines; ADHD practice patterns; and other measures, including attitudes about parent, teacher, and community influences on ADHD diagnosis and treatment. Bivariate and multivariate analyses were performed to assess patient and physician factors associated with adherence to guideline components.

Results. The overall response rate was 60%. The majority (77.4%) of primary care physicians were familiar with AAP guidelines on ADHD, and many (61.1%) reported incorporating the guidelines into their practice. Differences were apparent by specialty: 91.5% of pediatricians were familiar with the guidelines in contrast to 59.8% of family physicians. The majority of clinicians reported practices consistent with individual components of the diagnostic and treatment guidelines. However, when adherence to multiple components was analyzed together, only 25.8% of clinicians reported routine use of all 4 diagnostic components in the survey. In addition, some physicians continue to use diagnostic modalities that are currently not recommended for routine evaluation of school-aged children with ADHD—continuous performance testing, neuroimaging, and laboratory tests (eg, thyroid, lead, or iron testing). With regard to ADHD treatment, the majority (66.6%) of respondents reported routine recommendation of pharmacotherapy and titration of medications in the first month when prescribed (81.3%). However, just over half (53.1%) reported routine follow-up visits (3–4 times per year) for children who have ADHD and are taking medications. Most (53.4%) clinicians also recommended behavioral therapy for children who had a diagnosis of ADHD. Patterns of specialty differences were less consistent for treatment components: pediatricians were more likely to recommend medications, but family physicians reported more frequent follow-up evaluations for children who receive medications. There were no specialty differences in recommendations for behavioral therapy. In addition to physician specialty variations, differences in management were apparent by practice type and other demographic characteristics. There were few significant associations between adherence to guideline components and physician attitudes about parent, teacher, or community influences. However, these factors were noted by many respondents. Only 32.5% agreed that their community had adequate, accessible mental health resources. Half (50.1%) of the physicians reported that insurers limit coverage for assessment and treatment of ADHD.

Conclusions. Primary care physicians generally report awareness of pediatric ADHD guidelines and follow these clinical practice recommendations. However, some physician variations are apparent, and areas for improvement are noted. Many primary care physicians report poor access to mental health services, limited insurance coverage, and other potential system barriers to the delivery of ADHD care. Additional study is needed to confirm provider-reported data; to determine what constitutes high-quality, long-term management of this chronic condition; and to confirm how reported practices associate with long-term outcomes for children with ADHD. Pediatrics 2004;114:23–28. URL: http://www.pediatrics.org/cgi/content/full/114/1/e23; attention-deficit/hyperactivity disorder, pediatrics, family physicians, practice guidelines, CNS stimulants, mental health services.

ABBREVIATIONS. ADHD, attention-deficit/hyperactivity disorder; PD, pediatrician; FP, family physician; AAP, American Academy of Pediatrics.

Attention-deficit/hyperactivity disorder (ADHD) is the most common childhood behavioral complaint presenting to pediatricians (PDs) and family physicians (FPs). Recent reports indicate that in addition to a rise in the percentage of mental health visits to primary care physicians for ADHD, sizable increases occurred in the use of diagnostic and treatment services during the 1990s. Reports of a 2- to 3-fold increase in stimulant prescription rates during this time period furthered controversies in the medical literature and popular media regarding the care of children with ADHD. Despite research supporting the use of stimulants, concern regarding both overdiagnosis of ADHD and treatment with stimulants has continued. The scientific community has focused on the efficacy and risks of treatment while devoting limited attention to the quality and processes of care. The American Academy of Child and Adolescent Psychiatry developed...
practice parameters on the management of ADHD and use of stimulant medications; however, these were neither targeted nor disseminated to primary care providers, who see the majority of children with suspected attention-deficit disorders.

To address this void, the American Academy of Pediatrics (AAP) developed evidence-based guidelines for the diagnosis and treatment of children with ADHD. The AAP published 2 sets of ADHD practice guidelines for children aged 6 to 12 years: one for routine use of components of the guideline items for both diagnosis and treatment of ADHD. The majority of respondents reported reading and incorporating AAP guidelines into their practice. Overall, 91.5% of PDs were familiar with the guidelines, and 78.1% reported that they read and incorporated AAP guidelines into their practice. In contrast, 59.8% of FPs were familiar with the guidelines, and 39.0% reported having read and incorporated the AAP guidelines. The differences between PDs and FPs were statistically significant (P < .001).

Table 2 shows reported adherence to individual components of the guideline items for both diagnosis and treatment. The majority of respondents reported routine use of parent rating scales, teacher rating scales, and assessment for comorbidity. Fewer physicians reported routine use of the Diagnostic and Statistical Manual of Mental Disorders criteria for di-
nosis. Consistently, more PDs than FPs reported routine use of all diagnostic components specified in the guidelines. When we analyzed data for adherence to multiple components, only 34.9% of PDs and 14.3% of FPs reported routine use of all 4 diagnostic components in the survey.

The AAP guidelines specify that certain diagnostic tests should not be ordered routinely in the evaluation of children with suspected ADHD. Survey results were generally consistent with the guidelines in this domain; routine use was reported by only 9% of PDs and FPs for continuous performance testing and by <1% of PDs and FPs for neuroimaging/electroencephalogram. Laboratory tests (e.g., thyroid, lead, or iron testing) were performed more commonly, with 18.1% of PDs and 39.6% of FPs reporting routine use. The difference was statistically significant (P < .001).

With regard to ADHD treatment, the majority of respondents reported routine recommendation of pharmacotherapy, titration of medications, and follow-up visits. Patterns of specialty differences were less consistent for treatment components: PDs were more likely to recommend medications, but FPs reported more frequent follow-up evaluations for children who receive medications. There were no specialty differences in recommendations for behavioral therapy.

Attitudes and Beliefs Regarding ADHD Care
The final portion of the survey assessed physician attitudes and beliefs regarding factors that may in-
fluence ADHD diagnosis and treatment. A small but substantial proportion (20.4%) of respondents believed that parents are reluctant to accept a diagnosis of ADHD or that parents “don’t want to use medication” in ADHD treatment (14.2%). However, these beliefs showed no statistical association with routine use of parent rating scales in diagnosing ADHD, prescription of stimulant medications, or recommendation of behavioral therapy.

Many (55.3%) respondents agreed that teachers pressure them to diagnose ADHD and expect them to use medication for ADHD management (71.3%). There was, however, no statistical association between beliefs about teacher expectations and routine use of teacher rating scales in diagnosing ADHD or prescription of stimulant medications.

With regard to community influences, 43.9% agreed that “misuse of stimulants and other prescription medications is a concern in my community”; in bivariate analysis, physicians with this belief also reported less frequent recommendation of medication for ADHD (58.0% vs 72.5%; $P < .001$). Only 32.5% of respondents agreed that their community has adequate, accessible mental health resources. Physicians did not believe that stigma was a major barrier to care; only 12.4% reported that members of their community are less likely than those in other Michigan areas to seek care for mental health needs. Half (50.1%) of the physicians agreed that insurers limit coverage for assessment and treatment of ADHD. However, in bivariate analyses, attitudes regarding community resources and access to mental health care were not significantly associated with ADHD diagnosis or treatment practices.

**Multivariate Results**

Multivariate analysis was used to examine physician factors that predict reported physician incorporation of AAP guidelines into clinical practice. Results are shown in Table 3. After controlling for physician variables of gender, years in practice, additional behavioral training, practice ownership, percentage of practice in managed care, and percentage of practice in Medicaid, PDs were still more likely than FPs to report reading and incorporating AAP guidelines on ADHD into their practice (odds ratio: 4.9; 95% CI: 2.6–11.0).

**TABLE 3.** Likelihood of Incorporating AAP Guidelines Into Practice

<table>
<thead>
<tr>
<th>Guideline Component</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD</td>
<td>5.4</td>
<td>2.6–11.0</td>
</tr>
<tr>
<td>Additional behavioral/psychiatric training</td>
<td>4.2</td>
<td>0.8–22.1</td>
</tr>
<tr>
<td>Male gender</td>
<td>0.8</td>
<td>0.5–1.3</td>
</tr>
<tr>
<td>&gt;10 y in practice</td>
<td>0.8</td>
<td>0.5–1.3</td>
</tr>
<tr>
<td>Solo practice</td>
<td>0.5</td>
<td>0.3–0.9</td>
</tr>
<tr>
<td>Full-time practice</td>
<td>0.7</td>
<td>0.4–1.3</td>
</tr>
<tr>
<td>Academic practice</td>
<td>1.3</td>
<td>0.6–3.0</td>
</tr>
<tr>
<td>Volume of patients</td>
<td>1.0</td>
<td>0.5–2.0</td>
</tr>
<tr>
<td>(&gt;50/wk)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (&gt;40%) managed</td>
<td>0.9</td>
<td>0.7–1.2</td>
</tr>
<tr>
<td>care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (&gt;40%) Medicaid</td>
<td>1.0</td>
<td>0.7–1.3</td>
</tr>
</tbody>
</table>

CI indicates confidence interval.
and greater confidence in guidelines that are developed by their own specialty organizations. Additional attention should be given to wider and more deliberate dissemination of those practice guidelines that affect all primary care providers.

In addition to lack of awareness, there are multiple potential reasons for lack of adherence to guidelines: disagreement with recommendations, lack of physician self-efficacy, and other significant barriers such as reimbursement for services. Responses to items on potential service delivery barriers support factors such as lack of accessible mental health services and insurance coverage as important issues that many clinicians face across all specialties.

Although these results contribute to our understanding of the current reported primary care practices in ADHD care, several limitations must be noted. First, our sample includes only primary care providers in Michigan; thus, our results may not be generalizable to other regions. Second, our study assessed primary care physicians' reported diagnostic and treatment practices. Previous studies have demonstrated that physician self-report can over- or underestimate actual practice, when compared with confirmation methods such as chart audit or patient surveys. Additional confirmation of actual practice patterns for children with ADHD is necessary to validate physician-reported data. Finally, our study focuses on physician knowledge, beliefs, and practices for ADHD care. However, we need to consider contributions and perspectives of other providers, teachers, parents, and children themselves in the processes of care. Additional study on the role of school-based educational and counseling services should explore potential burdens and demands on services outside of the medical system.

This initial investigation found that most respondents provide care consistent with recommended practices. However, the guidelines are general and broadly defined in several areas, including the identification process and long-term management of ADHD. The process of identification for children with suspected attention problems is still largely unexplored. These important antecedent steps leading up to the diagnosis of ADHD are critical to a full understanding of practice and specialty variations. On the other side of the process, ADHD is a chronic condition; however, little attention has been paid to the ongoing evaluation and long-term treatment of children and adolescents. Even the AAP committee that developed the guidelines noted that insufficient evidence exists to guide follow-up and long-term care for ADHD.

In conclusion, our results suggest that primary care physicians are generally following evidence-based clinical practice guidelines for the care of children with ADHD, with differences by physician specialty, practice type, and other factors. Additional study is needed to examine the relationship between variations in care and clinical outcomes to determine what constitutes high-quality, long-term management of this chronic condition. Finally, we must continue to monitor practices as new treatment options and evidence emerge for school-aged children and adolescents.
other important groups such as preschoolers and adolescents.

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