

Identification of Attentional and Hyperactivity Problems in Primary Care: A Report From Pediatric Research in Office Settings and the Ambulatory Sentinel Practice Network

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ABSTRACT. *Objectives.* To 1) determine the frequency of identification of attentional and hyperactivity problems (AHPs) by clinicians, and 2) examine whether minority children or children from less well-educated, lower-income, or lower-functioning families would be more likely to be identified as having AHPs.

Design. Prospective cohort study of 22 059 consecutive children 4 to 15 years of age being seen for acute, chronic, and health supervision visits.

Setting. Practices of 401 pediatric and family practice clinicians in 44 states, Puerto Rico, and 4 Canadian provinces.

Methods. Parent questionnaires included demographic information and the Pediatric Symptom Checklist. Clinician questionnaires categorized psychosocial problems and addressed how assessment of problems was made. Analyses compared children with newly identified AHPs with those with other newly identified psychosocial problems.

Results. Clinicians identified behavior problems in 18.7% of children, with 9.2% of the entire sample identified as having AHPs. Among those with newly assessed AHPs, clinicians identified minority children and those from low-income or poorly functioning families as having AHPs at the same rate as other children. However, even after controlling for symptoms, males were more likely than females (odds ratio, 2.81) to be identified as having AHPs. Older clinicians were significantly more likely to identify children as having AHPs (odds ratio, 2.09). In assessing AHPs, clinicians used standardized tools such as behavioral questionnaires for only 36.9% of children, and Diagnostic and Statistical Manual criteria for 38.3% of children.

Conclusions. AHPs are highly prevalent in primary care practice. Clinicians do not appear predisposed to label children from disadvantaged backgrounds as having AHPs. Primary care assessment of AHPs lacks standardization. *Pediatrics* 1999;103(3). URL: <http://www.pediatrics.org/cgi/content/full/103/3/e38>; *primary care, child mental health, behavior problems, attention deficit*

hyperactivity disorder, attentional problems, hyperactivity.

ABBREVIATIONS. ADHD, attention deficit hyperactivity disorder; AHP(s), attentional and hyperactivity problem(s); PROS, Pediatric Research in Office Settings; ASPN, Ambulatory Sentinel Practice Network; AAP, American Academy of Pediatrics; DSM, Diagnostic and Statistical Manual; MC, managed care; FFS, fee-for-service; PSC, Pediatric Symptom Checklist.

Stimulant treatment of attention deficit hyperactivity disorder (ADHD) among school children has grown nearly every year since 1971, and two- to sixfold during the past 5 years.^{1,2} This dramatic increase has raised questions about the diagnostic practices of primary care physicians who provide the majority of pediatric stimulant prescriptions for ADHD and related problems in the United States.³

Stimulants are prescribed almost exclusively for youth diagnosed with ADHD. However, in practice, primary care clinicians do not always use formal diagnostic criteria and may prescribe for conditions not meeting the American Psychiatric Association's diagnostic criteria. For the purposes of this discussion, we refer to ADHD, as well as similar problems not necessarily meeting full criteria, with the more general term attentional and hyperactivity problems (AHPs). Little is known about primary care clinicians' assessment of youth presenting with psychosocial problems and why certain children are identified as having ADHD or AHPs.

Critics of the widespread use of ADHD and AHP diagnoses suggest that clinicians are engaging in the "medicalization" of social problems at school and home, with a tendency to label deviant behavior as a medical problem.⁴ With respect to AHPs, the word label is used here to mean the classification of deviant childhood behavior with the medical diagnosis of AHPs. Of additional concern is a growing body of research by mental health specialists that supports the differential application of labeling to behavioral problems according to ethnic and social characteristics.⁵⁻⁸ In these studies, it has been noted that African-American and other minority groups and/or any persons with greater social distance from clinicians are more likely than are European-Americans to receive certain psychiatric diagnoses. Extending

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this scenario to primary care, one might postulate that clinicians would be more likely to label those youth from poorly functioning families, of low-income, and with minority race or ethnicity as having AHPs, independent of parent-reported symptoms.

Previous research on primary care psychosocial identification and diagnostic practices for children has touched only briefly on clinician identification of attentional problems. AHPs were common in large-scale studies of psychosocial problems from pediatric practice samples in Rochester, NY,⁹ Pittsburgh, PA,¹⁰ and New Haven, CT.¹¹ However, these studies were limited to specific geographic areas proximate to academic centers, and investigators did not examine the characteristics of those labeled with attentional problems versus other patients with psychosocial problems. Among primary care studies directed exclusively at AHPs, Wolraich and colleagues¹² described diagnostic practices among 10 clinicians in the Midwest for children with more narrowly defined ADHD. However, characteristics that differentiate children identified with AHPs have not been studied in a large, representative sample.

The purpose of this study was to 1) determine the frequency of identification of AHPs by clinicians, and 2) examine factors associated with clinician identification of AHPs in children recognized with psychosocial problems. Specifically, we used a large national sample drawn from primary care practice to determine whether minority children or children from less well-educated, lower-income, or lower-functioning families were more likely to be identified by practitioners as having AHPs. We hypothesized that minority youth, children from low-income or from low-functioning families, and those less familiar to clinicians would be more likely labeled as having AHPs.

METHODS

Setting

The study was conducted in Pediatric Research in Office Settings (PROS)¹³ and the Ambulatory Sentinel Practice Network (ASPN),¹⁴ two large practice-based primary care research networks. PROS, a pediatric network established by the American Academy of Pediatrics (AAP) in 1986, currently comprises >1400 clinicians from >475 practices in all 50 states and the Commonwealth of Puerto Rico who provide care for ~1.75 million children in the United States. ASPN is a family medicine network that was established in 1978 and currently consists of ~750 clinicians from 38 states and 6 Canadian provinces who provide care for approximately a half-million patients. Eighty-nine percent of PROS clinicians are pediatricians, 10% are nurse practitioners, and 1% are physician assistants. Eighty-five percent of ASPN clinicians are family physicians, 7% are nurse practitioners, and 8% are physician assistants. ASPN also collaborated with two regional networks to expand the number of participating family physicians. The characteristics of the Wisconsin Research Network and the Minnesota Academy of Family Physicians Research Network are similar to those of ASPN, and contributed 38 and 24 participating clinicians, respectively. Recruitment of PROS and ASPN clinicians into the study has been described fully elsewhere.¹⁵ Of note, clinicians in the study were self-selected. A comparison of pediatricians in the study with a random sample of practicing AAP pediatricians revealed no differences in demographic factors, practice characteristics, and attitudes toward psychosocial problems. In total, this study included 401 pediatric and

family practice clinicians in 44 states, Puerto Rico, and 4 Canadian provinces.

Sample

Participating clinicians were asked to enroll 70 consecutive children 4 to 15 years of age who presented for nonemergency care (acute or well-child procedures only visits excluded) accompanied by a parent or primary caregiver who spoke English or Spanish. Of eligible children across all sites >82% participated. No differences in age or gender were detected in a comparison of participating with nonparticipating children. Children in the western United States were slightly more likely to participate. Results on 22 059 visits are reported. Among those visits, 994 (4.5%) had inadequate or missing data sufficient to preclude additional analyses, resulting in a total sample of 21 065 visits with adequate data. Of these subjects, 3934 (18.7%) were identified by the clinician as having a psychosocial problem, and 1947 (9.2%) were identified by the clinician as having "attention deficit/hyperactivity problems," and these make up the study sample.

Procedures

Procedures and consent forms were approved by institutional review boards affiliated with PROS, ASPN, and the University of Pittsburgh. Study procedures have been described in detail elsewhere.¹⁵ Parents (including primary caregivers) of eligible patients were approached in the practice waiting room for informed consent. Consenting parents completed a brief questionnaire before the visit assessing demographics, child and family functioning, and behavior problems. After the visit, the clinician completed a questionnaire describing patient insurance, reason for visit, recognition, and management of psychosocial problems.

Measures

Clinician-reported Items

Clinician Identification

Clinician identification of a psychosocial problem was noted as a positive response to the question, "Is there a new, ongoing or recurrent psychosocial problem present?" Psychosocial problems were defined as any mental disorders, psychological symptoms, or social situations warranting clinical attention or intervention in the opinion of the primary care clinician. Clinicians did not have access to any of the study data collected from parents, as described below.

Eleven psychosocial problem categories (Table 1) were developed through focus group discussions and pilot-testing for clinician categorization of identified psychosocial problems. The AHPs response category was called "attention deficit/hyperactivity problems." All problems were categorized as either "new" or "previously identified." Clinicians were not asked specifically about the diagnosis of ADHD. Focus group interviews of clini-

TABLE 1. Psychosocial Problem Response Categories

Psychosocial Problems Identified	New or Previously Recognized* n (%)
Adjustment reaction/reaction to stress	935 (23.8)
Behavioral/conduct problems	1570 (39.9)
Other emotional problems (eg, anxiety, sadness)	748 (19.0)
Attention deficit/hyperactivity problems	1947 (49.5)
Physical manifestations (eg, sleep, enuresis, or eating problems)	816 (20.7)
Specific developmental delays (learning disabilities)	644 (16.4)
Childhood psychosis	40 (1.0)
Drug and/or alcohol abuse/dependency	48 (1.2)
Mental retardation	135 (3.4)
Family dysfunction in absence of other problems	489 (12.4)
Other (specify)	335 (8.5)

* The column total exceeds 3934, the number of children identified in the sample of 21 065 as having a psychosocial problem, because the practitioners were asked to check all problems that applied for each patient.

cians indicated that the AHPs response category would include all children thought to have a diagnosis of ADHD, plus additional children with attentional and hyperactivity symptoms who might not have undergone diagnostic evaluation and/or who might not meet the formal diagnostic criteria for ADHD.

Assessment of Psychosocial Problems

Clinicians reported on the assessment techniques they had used to determine the psychosocial problem by indicating one or more of the categories "parent interview," "child interview," "school reports," "observation," standardized assessment tools (eg, behavior checklists), or "diagnosis made by someone else." No information was collected on the weight given to any one technique. Clinicians also were asked about their use of the Diagnostic and Statistical Manual (DSM III, IIR, or IV) criteria.

Insurance Status

Insurance status was reported by the person most knowledgeable about billing or insurance in the office and included both payer (eg, Medicaid, commercial, CHAMPUS, etc) and type (eg, health maintenance organization, fee-for-service [FFS], IPA). Insurance status was categorized as uninsured, Canadian Medicare, FFS, and MC. The FFS and MC categories also were subdivided into Medicaid and commercial groups for some analyses. Within the MC group, clinicians were instructed to identify whether patients were enrolled in health maintenance organizations, preferred provider organizations, individual practice associations, or other types of plans. In addition, the percent of MC patients in the practice was estimated by clinicians.

Clinician/Practice Characteristics

Clinicians indicated their discipline by choosing from a list of seven categories: family practice, pediatrics, internal medicine, physician assistant, family or pediatric nurse practitioner, and other. These categories were collapsed into family practice versus all others. Type of practice structure was indicated from a list of seven categories: solo, two-person partnership, family practice group, pediatric practice group, multispecialty group, corporation, other. These categories then were collapsed into solo versus all others. US Census Bureau classifications of Northeast, South, Midwest, and West were used to define practice location.

Visit Characteristics

Clinicians reported on whether the patient was their primary care patient. They could choose from five discrete categories (including unspecified other), which were combined into three separate categories: their personal patient, their group's patient, or not a primary care patient for the practice.

Parent- or Guardian-reported Items

Behavior Problems

The Pediatric Symptom Checklist (PSC) is a brief parent-report symptom list for primary care.¹⁵ The PSC consists of 35 items with "never" (0 points), "sometimes" (1 point), and "often" (2 points) responses for parents on particular behaviors. An overall sum represents parental impression of their child's psychosocial functioning. The PSC has demonstrated strong internal consistency, test-retest reliability, and validity with psychiatric assessments of child functioning.^{16,17} The PSC has been demonstrated to be a valid and reliable measure for minority and disadvantaged youth.¹⁸

A factor analysis of PSC responses was conducted, which yielded discrete subscales for attentional, oppositional, and internalizing symptoms.¹⁹ Examples of PSC items that load in the attentional subscale include "daydream too much," and "distract easily"; in the oppositional subscale, "not listen to rules," "fight with other children," and "refuse to share"; and in the internalizing subscale, "feel sad," "worry a lot," and "feel down on self." These subscales were used in analyses to examine the association of clinician recognition of AHPs with parent symptom reports.

Family Functioning

Family functioning was measured using the Family Apgar instrument, a five-item scale designed to measure adult satisfaction with family support.^{20,21}

Patient Demographics

Parents or guardians reported on patient race, ethnicity, age, and gender on the Parent Questionnaire. Parents reported on both race and ethnicity. Parental education was classified as the highest level of education for either parent. Marital status was categorized

as children living with their married parents versus all others. Because no data on family income were collected, Medicaid insurance was used as a proxy for family income.

Analysis

We counted clinician reports of diagnostic assessment techniques in children with AHPs. Children identified with AHPs were compared with children with psychosocial problems not identified as AHPs using χ^2 tests. Analyses to determine factors associated with identification of AHPs were restricted to children with newly identified problems. This was done because clinicians frequently schedule follow-up office visits for children with AHPs whom they have identified previously and prescribed stimulants, causing the sample of children identified previously to be over-represented with children on stimulant medication. For the group of children with newly identified problems, a logistic regression was performed to identify characteristics associated with identification of AHPs versus a non-AHP problem. Estimated odds ratios were calculated from regression coefficients.

RESULTS

Clinicians reported that 18.7% ($n = 3934$) of all visits for children 4 to 15 years of age involved children with psychosocial problems. Selected demographic characteristics of the children with psychosocial problems were as follows: race/ethnicity, 81.8% white (not Hispanic), 7.4% African-American, 7.9% Hispanic, 2.8% other; marital status, 57.2% with both parents married and living at home; education, 54.1% with at least one parent with some education beyond high school, 17.2% with a parent with a graduate or professional degree; and insurance, 2.3% Canadian, 4.6% uninsured, 28.0% Medicaid, 65.1% commercial. Clinicians reported using the following in making their assessments about AHPs: "parent interview" (87.1%), "child interview" (66.6%), "school reports" (53.5%), "observation" (47.3%), and "standardized assessment tools" (eg, behavior checklist) (36.9%). In 28.9% of subjects, the diagnosis had been "made by someone else." DSM criteria were used in only 38.3% of subjects.

For youth with clinician-identified psychosocial problems, we compared those with AHPs versus those without AHPs on child and clinician characteristics. Because we were interested primarily in how clinicians initially categorized children with AHPs compared with other problems, Table 2 presents data for all visits as well as separately for newly identified problems. Including those with problems identified previously, AHP-related visits accounted for 49.5% (1947/3934) of the cases, presumably including return visits for stimulant management. In contrast, AHPs were noted in only 27.1% (263/971) of new psychosocial problems. As expected, males were significantly more likely to be identified as having newly identified AHPs. No racial or ethnic differences were noted in this group.

Table 3 presents the results of the logistic regression. In multivariate analyses examining newly identified psychosocial problems, boys were almost three times as likely to be categorized as having AHPs compared with girls. Children in the early school years (7 to 10 years of age) were twice as likely to be identified as having AHPs, as were those with higher scores on the attentional subscale of the PSC. In

TABLE 2. Patient Demographics and Identification of AHPs Among Children With Psychosocial Problems: Overall Identified Sample and New Problem Visits Only

	Overall Sample (<i>n</i> = 3934)		New Visits Only (<i>n</i> = 971)	
	Non-AHPs (50.5%)	AHPs (49.5%)	Non-AHPs (72.9%)	AHPs (27.1%)
Race/ethnicity				
White (not Hispanic)	50.1	49.9	73.3	26.7
African-American	49.5	50.5	68.7	31.3
Hispanic	55.8	44.2	72.7	27.8
Other	50.9	49.1	73.9	26.1
Age (y)				
4–6	68.2	31.8	80.1	19.9
7–10	40.5	59.5	62.1	37.9
11–15	48.2	51.8***	79.0	21.0**
Gender				
Female	69.8	30.2	84.4	15.6
Male	40.0	60.0***	63.8	36.2***
Living with both parents				
No	49.7	50.3	73.7	26.3
Yes	51.6	48.4	71.9	28.1
Parent education				
≤High school diploma	49.0	51.0	72.0	28.0
One parent >high school	49.8	50.2	73.5	26.5
One parent >college	55.4	44.6*	72.6	27.4
Insurance category				
Uninsured	57.2	42.8	78.6	21.4
Canadian	43.3	56.7	71.4	28.6
MC	51.3	48.7	75.4	24.6
FFS	49.4	50.6	69.5	30.5
Medicaid	51.7	48.3	73.5	26.5

* $P < .05$; ** $P < .01$; *** $P \leq .001$.

contrast, higher scores on the internalizing subscale of the PSC were associated with lower rates of AHPs.

Besides patient factors, children seen by older primary care clinicians were more likely to have new psychosocial problems identified as AHPs. No statistically significant differences were identified for clinician specialty, type of insurance, or whether the child was the clinician's own primary care patient.

DISCUSSION

Our study found little support for the contention that primary care clinicians use AHPs to label children with social and family problems. Clinicians were not more likely to describe the presence of AHPs among minority youth or among those with low family functioning. Also, AHPs rates did not vary by insurance category (our proxy for income) or household structure. This reinforces our previous findings in a smaller sample¹⁵ that after controlling for parent-reported symptoms, overall identification of child psychosocial problems did not vary by racial or ethnic status, educational level of parents, insurance status, or family functioning among primary care clinicians.

Our results contrast with studies cited previously in which mental health specialists displayed different diagnostic tendencies across ethnic and racial groups. However, primary care practice may be different for a variety of reasons. First, the severity of mental health symptoms is much lower in primary care compared with specialty mental health settings. Second, the less differentiated character of symptoms in primary care and the reluctance of primary care clinicians to use psychiatric diagnostic categories may discourage tendencies toward labeling. Finally,

primary care practice may be very different from specialty practice in that the primary care clinicians more often have long-standing relationships with and extensive knowledge of their patients. In this study, >60% of visits made by children were to providers who characterized the subjects as their own patients. This continuity and familiarity with the patient may supersede any tendency by providers to use diagnostic labels inappropriately.

Although socially biased labeling was not supported by our findings, other patient and clinician factors were found to differentiate children with clinician-identified AHPs from those without AHPs. Even after controlling for parent-reported symptoms, girls were less likely to be described as having AHPs. In conjunction with our previous report noting much lower rates of overall problem recognition for girls,¹⁵ our study suggests that girls with significant psychosocial problems are not recognized and, when recognized, are noted infrequently to have AHPs. These girls nevertheless are likely to be at high risk for school failure and family problems. Parental report of internalizing symptoms such as worry, anxiety, and sadness was associated with lower rates of AHP identification. Because internalizing symptoms are more common among girls, it is possible that clinicians focused on these symptoms and failed to notice symptoms of AHPs. Whatever the reason for this gender difference, this study suggests the need for future intervention efforts to make primary care clinicians aware that they may be overlooking AHPs in girls.

Besides patient factors, the age of the clinician also was associated with AHP rates. Older clinicians were more likely to classify children with psychosocial

TABLE 3. Clinician Identification of New AHPs

Variable	Logistic Regression Results	
	Odds Ratio	P Value
Clinician and practice factors		
Male	0.924	.69
37–40 y	1.131	.71
41–43 y	1.590	.16
44–49 y	1.627	.12
≥50 y	2.088	.02
Family practitioner	0.595	.07
Solo practice	1.386	.30
High MC %	1.112	.70
Early patient	0.912	.63
Northeast	0.611	.07
South	1.129	.65
West	0.584	.08
Patient factors		
African-American	0.954	.90
Hispanic	1.062	.86
Other	0.844	.79
Male	2.807	.0001
Parents not together, nor married	1.104	.64
Older age group, 11–15 y	1.424	.20
Middle age group, 7–10 y	2.139	.001
One parent >high school	0.916	.70
One parent >college	1.253	.46
PSC15 Attentional Subscale score	2.084	.0001
PSC15 Externalizing Subscale score	1.075	.09
PSC15 Internalizing Subscale score	0.791	.0001
Family Apgar score ≤5	0.835	.47
Visit factors		
My patient	0.843	.48
Uninsured	0.489	.13
Medicaid MC	0.606	.18
Medicaid FFS	0.794	.50
Commercial MC	0.792	.34
Medicare (Canada)	1.710	.53

problems as having AHPs compared with the younger, and presumably recently trained, clinicians. Although this trend is statistically significant in both bivariate and multivariate comparisons, its clinical relevance is not clear. It is possible that older, more experienced clinicians are more comfortable classifying children with psychosocial problems as having AHPs, with the accompanying implication of possible stimulant therapy. It also is possible that younger clinicians, who presumably have had more recent formal training in behavioral pediatrics, are more comfortable using other diagnoses in children with psychosocial problems.

Although the design of our study precludes any detailed assessment of clinicians' decision-making process, our study suggests that clinicians are relying primarily on interviews of parents and children and, to a lesser extent, on reports from school, in making their assessments of AHPs. Standardized assessment tools such as behavioral questionnaires are being used in slightly greater than one third of patients with AHPs, with the DSM criteria being used in a similar proportion. These results suggest a lack of standardization in the primary care evaluation process for AHPs.

The size and scope of this study provide some reassurance about the stability and external validity of these results. Nevertheless, the study is limited in several ways. First, the study included mostly pa-

tients seen in private, primary care, office-based practices. Although such settings account for >80% of all outpatient pediatric care in the United States, some racial and ethnic groups are represented less often in such settings.²² The lowest income groups frequently use hospital-based clinics, neighborhood health centers, and emergency rooms for their pediatric primary care and, as such, are not well represented in this sample. Additional assessments of child and family mental health also would have strengthened the study. Although the PSC has been used extensively and validated against other behavioral scales and measures of dysfunction, it is not a diagnostic instrument. More detailed assessment of ADHD symptoms and family history would have allowed more specific categorization of children. Finally, although a large-scale study such as this can report major trends in diagnostic behaviors by primary care clinicians, it is unable to explore the reasoning or decision-making strategies that providers use during office visits for new psychosocial problems.

IMPLICATIONS

We find it reassuring that our analysis revealed no evidence for social, ethnic, or racial influences in the diagnosis of AHPs by primary care clinicians. Based on the study findings, we offer several recommendations. First, better investigations are needed to provide a more detailed focus on clinician decision-making used in diagnosing AHPs. Although understanding the elements of diagnosis are important for all childhood psychosocial problems, they are especially critical for AHPs, in which long-term stimulant medication is a therapy commonly recommended and the consequences of a false-positive diagnosis are higher. Second, the underrecognition of girls with AHPs demonstrated in this study underscores the need to use our current understanding of attentional disorders to standardize the psychosocial diagnostic process. To this end, a subcommittee of the AAP Committee on Quality Improvement is currently developing an evidence-based practice guideline on the diagnosis of ADHD. Only through such endeavors can the identification of AHPs in primary care be improved.

APPENDIX. Participating CBS Practices

PROS Participating Practices

The pediatric practices or individual practitioners who completed this study are listed here by AAP Chapter: Alabama, Drs Heilpern and Reynolds, PC (Birmingham); Alaska, Anchorage Neighborhood Health Center (Anchorage); Arizona, Mesa Pediatrics Professional Association (Mesa), Pediatric Ambulatory Care Clinic (Phoenix), Orange Grove Pediatrics (Tucson); California 1, Anita Tolentino-Macaraeg, MD (Hollister), Palo Alto Medical Foundation (Los Altos); Colorado, Arvada Pediatric Associates (Arvada), Family Health Center (Denver), Gino Figlio, MD (Lamar); Connecticut, Gerald Jensen, MD (Bristol), Barry Keller, MD (Danbury), Community Health Services (Hartford), St. Francis Pediatric Primary Care Center (Hartford); Florida, Atlantic Coast Pediatrics (Merritt Island), Children's Clinic (Tallahassee); Georgia, The Pediatric Center (Stone Mountain); Hawaii, Melinda Ashton, MD (Honolulu), Straub Clinic-Pediatrics (Aiea); Iowa, Newborn & Pediatric Specialist, PC (Des Moines), David Kelly, MD (Marshalltown); Illinois, SIU Physicians & Surgeons

(Auburn), Emalee Flaherty, MD (Chicago), Southwest Pediatrics (Palos Park); Indiana, Bloomington Pediatric Association (Bloomington), Community Health Access Program (Bloomington), Georgetown Medical Care (Indianapolis), Jeffersonville Pediatrics (Jeffersonville), Pediatric Advocates (Peru); Kansas, Bethel Pediatrics (Newton); Kentucky, Tri-State Pediatrics, PSC (Ashland); Louisiana, Children's Clinic of Southwest LA (Lake Charles); Maine, John Salvato, MD (Waterville), Intermed Pediatrics (Yarmouth); Maryland, O'Donovan & Ahluwalia, MD, PA (Baltimore), Children's Medical Group (Cumberland), Shore Pediatrics (Easton), Clinical Associates Pediatrics (Towson/Woodlawn); Massachusetts, Holyoke Pediatric Associates (Holyoke), Medical Associates (Leominster), The Fallon Clinic (Worcester); Michigan, University Pediatricians, PC (Detroit), Pediatric Associates of Farmington (Farmington), Mott Children's Health Center (Flint), H. M. Hildebrandt, MD (Ypsilanti); Montana, Stevensville Pediatrics (Stevensville); Nebraska, Southwest Pediatrics (Omaha); Nevada, Capital Medical Associates (Carson City), Physician's Center West (Fallon); New Hampshire, Exeter Pediatric Associates (Exeter); New Jersey, Delaware Valley Pediatric Association (Lawrenceville); New Mexico, Albuquerque Pediatric Association (Albuquerque); New York 1, Pediatric Associates (Camillus), Elmwood Pediatric Group (Rochester), Park Medical Group (Rochester), Edward D. Lewis, MD (Rochester), Panorama Pediatric Group (Rochester), Amherst Pediatric Associates (Williamsville); New York 2, Centro Medico (Jackson Heights); New York 3, Pediatric Office at Roosevelt Island (New York); North Carolina, Triangle Pediatric Center (Cary), Goldsboro Pediatrics (Goldsboro), Medical Association of Surry (Mount Airy), Peace Haven Family Health Center (Winston-Salem); North Dakota, MeritCare Medical Group—Pediatrics (Fargo), Altru Clinic (Grand Forks), Dakota Clinic (Jamestown), Medical Arts Clinic (Minot); Ohio, Oxford Pediatrics & Adolescents (Oxford), Pediatrics (Portsmouth), St. Elizabeth Health Center (Youngstown); Oklahoma, Eastern Oklahoma Medical Plaza (Poteau), Shawnee Medical Center Clinic (Shawnee), Pediatric & Adolescent Care (Tulsa); Pennsylvania, Pediatric Practice of Northeastern (Honesdale), Schuylkill Pediatrics (Pottsville), Cevallos and Moise Pediatric Associates, PC (Quakertown), Pennridge Pediatric Associates (Sellersville); Puerto Rico, Ethel Lamela, MD (Isabela), Primary Care Pediatric Clinic Catano (Rio Piedras); Rhode Island, Marvin Wasser, MD (Cranston); South Carolina, Carolina Primary Care (Columbia); Tennessee, Johnson City Pediatrics (Johnson City); Texas, The Pediatric Clinic (Greenville), Department of Pediatrics (Lackland Air Force Base), MD Pediatric Associates (Lewisville), Winnsboro Pediatrics (Winnsboro); Utah, Gordon Glade, MD (American Fork), Mountain View Pediatrics (Sandy), Salt Lake Clinic (Sandy), Granger Medical Center (West Valley City); Vermont, CHP Brattleboro Pediatrics (Brattleboro), University Pediatrics (Burlington), Rebecca Collman, MD (Colchester), Essex Pediatrics (Essex Junction), Mouse-trap Pediatrics (Milton), CHP Timber Lane Pediatrics (South Burlington), Joseph Hagan, Jr, MD (South Burlington), Practitioners of Pediatric Medicine (South Burlington), University Pediatrics (Williston); Virginia, Drs Casey, Goldman, Lischwe, Garrett, and Kim (Arlington), James River Pediatrics (Midlothian), Pediatric Faculty Practice Office (Richmond); Washington, Jemima Tso, MD (Auburn), Redmond Pediatrics (Redmond), Rockwood Clinic (Spokane); West Virginia, Tess Alejo (Martinsburg), Medical & Pediatric Associates (Parkersburg), Grant Memorial Pediatrics (Petersburg); Wisconsin, Beloit Clinic SC (Beloit), Middleton Pediatric Clinic (Middleton), Waukesha Pediatric Associates (Waukesha), Gundersen Clinic—Whitehall (Whitehall); Wyoming, Cheyenne Children's Clinic (Cheyenne), Jackson Pediatrics (Jackson).

ASPN Participating Practices

Arkansas, Batesville Family Practice Center (Batesville); California, Foothills Family Medical Group (Auburn), Loma Linda Family Medical Group (Loma Linda); Colorado, Renate Justin, MD (Fort Collins), Harrington, Knaus & Spence, PC (Carbondale), La Mariposa Clinic (Denver), Colorado Springs Health Partners (Monument), Penrose Family Health Center (Penrose); Florida, The Family Doctors of Belleview (Belleview); Georgia, Titus Taube, MD (Warner Robbins); Louisiana, Family Medicine Center of Baton Rouge (Baton Rouge); Minnesota, Eagle Medical (Excelsior), Ramsey Clinic—Maplewood (Maplewood); New Hampshire, Mascoma Valley Community Care (Enfield) Hillsboro Medical

Services (Hillsboro); New Jersey, A. John Orzano, MD (Flemington), Community Care Center (Lebanon); New Mexico, Santa Fe Family Practice (Santa Fe); New York, Raj B. Kachoria, MD (Macedon), Canal Park Family Practice (Palmyra), Montefiore Comprehensive Family Care (Bronx), Mary Kay Ness, MD (Honeoye Falls); North Carolina, Bakersville Community Medical Clinic (Bakersville), Nalli Clinic (Matthews); North Dakota, University of North Dakota Family Practice Center—Minot (Minot), Minot Center for Family Medicine (Minot); Ohio, Center for Family Medicine (Cleveland); Oregon, Dunes Family Health Care, Inc (Reedsport); Pennsylvania, John Farmer, DO (Waynesboro), Good Samaritan Family Practice (Lebanon); Tennessee, Michael H. Hartsell, MD (Greeneville), Mountain City Extended Hours Clinic (Mountain City); Texas, Van Horn Rural Health Clinic (Van Horn); Virginia, June Tunstall, MD (Surry); Tappahannock Family Practice (Tappahannock); West Virginia, North Fayette Family Health Center (Hico); Wisconsin, Kronenwetter Clinic (Mosinee); Alberta, Foothills Family Medicine Center (Black Diamond); New Brunswick, David Ross, MD (Moncton); Newfoundland, Newhook Community Health Center (Whitbourne), Ross Thomas, MD (Sackville); Ontario, Steve Nantes, MD (Kitchener), Metcalfe & Dowdell (Kitchener), Bryan Alton, MD (Hamilton).

Minnesota Academy of Family Physicians Research Network Participating Practices

Family Medical Practice, PA (Willman), Family Medicine of Winona (Winona), River Valley Clinic (Hastings), Family Medicine Clinic of Lake Crystal (Lake Crystal), Gateway Family Health Clinic (Moose Lake), Eagan Medical Associates (Eagan), Fairview Uptown Clinic (Minneapolis), Bay Area Health Center (Silver Bay), West Side Health Center (St. Paul), Hopkins Family Physicians (Hopkins), Family Practice Center (St. Cloud), Mt. Royal Medical Center (Duluth), North Memorial Family Practice (Minneapolis).

Wisconsin Research Network Participating Practices

Wisconsin, Poynette Family Practice Center (Poynette), Medical Associates (Baraboo), Plymouth Family Physicians (Plymouth), Monroe Clinic (Monroe), UCC/Mona Grove (Madison), Family Doctors—Black Creek (Black Creek), Southwestern Family Practice (South Milwaukee), Family Health Plan (Elm Grove), LaSalle Clinic (Appleton), Marshfield Clinic—Merrill Center (Merrill), Tigerton Clinic (Tigerton), Dean Medical (Oregon), Physicians Plus/Fitchburg (Fitchburg), Family Health Plan (Glendale), Franciscan Skemp Clinic (Tomah), Galesville Medical Center (Galesville), Medical Associates (Beaver Dam), LaSalle Clinic (Waupaca).

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