

ANTIPSYCHOTIC MEDICATION USE IN MEDICAID CHILDREN AND ADOLESCENTS: Report and Resource Guide From a 16-State Study

This report is the product of a collaboration of 16 States, the Medicaid Medical Directors Learning Network (MMDLN) and the Rutgers CERTs (Center for Education and Research on Mental Health Therapeutics).

Prepared by the Publication Committee:

State Medicaid

Mary Ellen Foti, M.D.; Gordon Harper, M.D.; Robert Moon, M.D.; George Oestreich, Pharm.D., M.P.A.; Roger Snow, M.D., M.P.H.; Jeffery Thompson, M.D., M.P.H.

State Mental Health

Molly Finnerty, M.D.; Elsie Freeman, M.D.; Penny Knapp, M.D.; Nina Jo Muse, M.D.; Joseph Parks, M.D.

Rutgers CERTs

Stephen Crystal, Ph.D.; Tobias Gerhard, Ph.D.

AHRQ

Nancy Wilson, M.D., M.P.H.

**Medicaid Medical Directors Learning Network (MMDLN)/Rutgers CERTs
Publication No. 1.**

June 2010

Acknowledgments

This *Report and Resource Guide* is a publication for State Medicaid programs and other stakeholders concerned with care of children and youth in these programs. It is the product of a unique collaboration among 16 States and the Rutgers Center for Education and Research on Mental Health Therapeutics (CERTs) under the auspices of the Medicaid Medical Directors Learning Network (MMDLN). Both the MMDLN and the CERTs are supported and funded by the Agency for Healthcare Research and Quality (AHRQ). Valuable input and advice for this project came from the National Association of State Medicaid Directors (NASMD) and the National Association of State Mental Health Program Directors (NASMHPD). The data and trends represent the combined results of analyses by the collaborating States of their claims for some 12 million children and adolescents in 16 States over four years (2004-2007). The writing of the *Report and Resource Guide* was done via a publication committee with representation from several States and the Rutgers CERTs, as listed on the cover page. The idea for the *Guide* was originated by Jeffery Thompson, M.D. and other Medicaid Medical Directors who strive to move research into the practice of health care and health care policy, together with Stephen Crystal, Ph.D. and Tobias Gerhard, Ph.D., who provided extensive and indispensable expertise, support, and guidance in this work. Numerous people contributed to the concept by sharing information, serving on data definition groups, and reading multiple drafts. The content and interpretations reflect the collaborative process and assessments of the Publication Committee as a whole and do not necessarily reflect the views of AHRQ, the CERTs steering committee, the Rutgers CERTs, AcademyHealth, or individuals who reviewed and commented on sections of the work.

We acknowledge the generous consultations and contributions of:

Partners in Project from AcademyHealth: Amanda Brodt; Katherine Griffith; Emily McPherson.

Data-Analytic Work with Washington Data: Taik Lee.

Data Aggregation from the Rutgers CERTs: Theresa Viggiano, Edmond S. Malka.

Participating States: Alabama, California, Colorado, Illinois, Indiana, Maine, Massachusetts, Missouri, New Hampshire, New York, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Washington.

We also acknowledge and would like to express our appreciation for the valuable comments and editorial suggestions received on drafts of the Report and Resource Guide from Jean R. Slutsky; Marjorie Shofer; Anne Trontell; Parivash Nourjah; and William Lawrence at AHRQ.

Suggested Citation

Medicaid Medical Directors Learning Network and Rutgers Center for Education and Research on Mental Health Therapeutics. *Antipsychotic Medication Use in Medicaid Children and Adolescents: Report and Resource Guide from a 16-State Study*. MMDLN/Rutgers CERTs Publication #1. July 2010. Distributed by Rutgers CERTs at <http://rci.rutgers.edu/~cseap/MMDLNAPKIDS.html>.

Note: This report, without modification, may be freely redistributed. Content may not be modified without permission.

Foreword

The *Report and Resource Guide* on improving quality in the management of antipsychotic use among Medicaid children, and its accompanying data dictionary and compendium of State practices, were motivated principally by the desire of the consortium to provide information that would be useful for State officials, across the nation, in their efforts to improve quality of mental health care for their Medicaid populations. We hope that they will also be useful to others who are concerned with these aims. Incorporating pooled results from States' analyses of their antipsychotic and mental health drug use derived from claims data, the *Report and Resource Guide* aims to provide information that can contribute to State efforts to assess the quality of care in their programs, across counties and prescribers, using quality improvement strategies best suited to State conditions. The States mentioned in this guide gave permission to use their data for illustrative and comparative purposes so that others could learn by their examples.

The *Guide* and compendium of practices were developed with the goal of contributing to the efforts of State leaders who struggle with quality improvement and facilitating the sharing of expertise, ideas, knowledge, and solutions. The various sections may be of particular interest to different users. For example, Sections 1, 4, and 6 may be most useful to senior leaders who are responsible for making the case for mental health quality improvement and taking action, while Sections 2, 3, and 5 may be most useful to program staff involved in developing and implementing specific quality improvement strategies. The goal, of course, is that all groups work on these topics as a team. It is within those discussions and sharing and working together we hope to achieve what we set out to do—help States improve the quality of mental health care and prescription drug use.

Many people for whom these learning tools were intended—State elected and appointed leaders as well as officials in State health departments, mental health and children's programs, Medicaid offices, and other Medicaid officials and stakeholders—provided comments and feedback throughout the development and finalization process. We offer our thanks to all the contributors for this input, and hope that they will use the *Report and Resource Guide*, State practices, and data dictionary in many different ways: to assess their current structure and status, to create new quality improvement programs, to build upon existing programs, and to share with their partners including consumer groups; managed care organizations; mental health clinics; and the clinicians who care for the often-vulnerable population of Medicaid beneficiaries. If you have any comments or questions on the *Report and Resource Guide*, please contact:

Jeffery Thompson, M.D., M.P.H.
Chief Medical Officer
Washington State Medicaid
Olympia WA
Thompj@dshs.wa.gov

Table of Contents

INTRODUCTION	5
Report and Resource Guide	5
What Tools and Resources are in the <i>Report and Resource Guide</i> ?	6
What is the Medicaid Medical Directors Learning Network?	6
Which Stakeholders May Find the <i>Report and Resource Guide</i> Helpful?	7
What is the Structure and Organization of the <i>Report and Resource Guide</i> ?	7
Challenges	8
SECTION 1: Background	10
Clinical Concerns	10
Access to Services	11
Application of Diagnostic Criteria	11
Prescribing Patterns and Use of Mental Health Services	11
Safety	12
Evidence-Based Practices	12
SECTION 2: Methods and Project Timeline	13
SECTION 3: Data	14
Project Population	14
AP Utilization	14
Medicaid Programs and Populations Served	18
Core Measures	18
Results	20
Discussion and Limitations	23
SECTION 4: Interventions	25
Policy	27
Stakeholder Engagement/Management	27
Education/Marketing	27
Feedback	28
System Interventions	29
Characterizing State Implementation Strategies: A Classification Matrix	30
SECTION 5 : Change Management	32
Plan-Do-Study-Act (PDSA) Model	32
Case Study	34
Developing a State Strategy	35
SECTION 6: Lessons Learned	38
Summary of Project Findings	38
Implications for the Future	38
Conclusion	40
EPILOGUE: Outcomes of Participation	41
ATTACHMENTS	
State Practices: 36 State Practice to Improve AP Medication Safety and Quality	
Data Dictionary	
Blank Excel Spreadsheets	
National Drug Codes	

INTRODUCTION

By one estimate, more than 15 million children and adolescents in the United States have a diagnosable psychiatric disorder, often leading to functional impairment and developmental delays in academic, emotional, social, and/or behavioral skills.¹ Many children and adolescents with mental health needs face a variety of barriers to mental health evaluation, psychosocial treatment and other mental health services.² At the same time researchers and payers have noted increased and broadened use of antipsychotic medications for a wide range of clinical indications in children, raising a range of policy challenges for Medicaid programs and other payers, patients and clinicians.³ In response to these concerns, the challenges of mental health services in Medicaid were discussed among State Medicaid Medical Directors and investigators from the Rutgers Center for Education and Research on Mental Health Therapeutics (CERTs) in June 2007 during an Agency for Healthcare Research and Quality (AHRQ) supported Medicaid Medical Directors Learning Network meeting. Out of that discussion, State Medicaid Medical Directors and the Rutgers CERTs developed a plan for a collaborative project to examine the use of antipsychotic (AP) medications for children and adolescents in Medicaid. States provided the analysis of data and policies reported in this guide. Vital convening, expertise, and other support for the project was provided through the AHRQ-funded Rutgers CERTs and Medicaid Medical Directors Learning Network (MMDLN). The National Association of Medicaid Directors and the National Association of State Mental Health Program Directors provided additional review and input. Ultimately, a consortium of 16 States participated, representing a combined enrollment of 12 million children and adolescents in Medicaid. The purpose of the collaborative was to:

- Conduct exploratory analyses in each State on antipsychotic medication use rates and trends for children and adolescents in fee-for-service Medicaid using a comparable set of indicators that could “flag” possible safety and quality issues;
- Provide a forum for discussion of policies and programs for optimizing AP medication prescribing among States; and
- Develop a compendium of State practices classified by the contributing States as mature, promising and emerging according to a consensually developed classification matrix created for this project by the project participants that could be shared with other States to address AP utilization issues.

Report and Resource Guide

The *Report and Resource Guide* provides a set of sections that provide information on aspects of utilization from pooled data, relevant State policies, and definitions for States to use claims data in addressing issues regarding antipsychotic medication prescribing for children and adolescents. Each State’s environment and Medicaid program faces differing pressures, needs, and opportunities. The *Guide* provides information on the 16-State collaborative effort that can inform efforts to examine and understand antipsychotic use and trends related to claims data and utilization flags in each State, including the consortium’s development of a common set of potential safety and quality measures for exploratory analysis of antipsychotic medication utilization. This initial set of measures, developed based on feasibility of calculation by State data analysts under the project’s time and resource constraints, provided a framework for initial

exploration of use patterns and aims to provide the starting point for a more fully developed set of metrics for monitoring treatment patterns over time and across subpopulations, geographic areas and providers. The *Guide* also provides information on State practices related to quality improvement that may inform future activities. These materials are compiled with the aim of assisting efforts to foster prescribing patterns that are supported by evidence, and with the objective of maximizing optimal treatment and health outcomes for the child and adolescent Medicaid population.

The work of the Antipsychotics in Children consortium, which underlies this report, reflects a unique collaboration of State leaders and researchers. Noteworthy was the active involvement of State officials from both Medicaid and Mental Health agencies. Both sets of expertise were key in the project's efforts to address the complex programmatic and clinical issues that influence the care of children and adolescents with mental health conditions. Perhaps more importantly, we all learned from each other and developed a deeper appreciation of the complexities of these issues, as well as the importance of collaboration between Medicaid and mental health programs and between States.

What Tools and Resources are in the Report and Resource Guide?

- A detailed description of how 16 States produced AP and mental health drug utilization data using their pharmacy claims systems.
- A data dictionary and methodology that can be adapted by States to develop similar analyses/reports.
- An overview of the utilization of AP medications in the pooled pediatric FFS Medicaid population of 16 States.
- A description of programs and policies regarding AP medication utilization controls for each of the 16 States.
- A compendium of State-provided information from the States on a total of 36 practices related to AP utilization issues, categorized by the contributing States as mature, promising or emerging based on collaboratively-developed definitions.

What is the Medicaid Medical Directors Learning Network?

The Medicaid Medical Directors Learning Network (MMDLN) was designed to assist clinical leaders in identifying and applying the latest research findings and related information to address high-priority policy and program issues, especially related to quality assurance, quality improvement, and coverage decisions. The current group, composed of State Medicaid Medical Directors from 42 States, began its work in November 2005. The network enables Medicaid Medical Directors to:

- Exchange ideas with their peers and foster a community that encourages colleagues to gather ideas and share experiences with one another;
- Gain access to resources, such as studies, reports, and decision-support tools developed by State Medicaid agencies, AHRQ, and other sources; and
- Foster collaboration to solve problems by working together on issues related to advancing the health of Medicaid enrollees.

Which Stakeholders May Find the Report and Resource Guide Helpful?

- **State Medicaid, Mental Health, and Child Welfare Agencies:** Commissioners, medical directors, pharmacy directors, program staff, quality assurance staff, and others interested in AP medication utilization controls and quality improvement for children and adolescents in Medicaid.
- **State Leaders:** Governors, legislators, and their staff who provide leadership on health policy and/or budget.
- **Clinicians and Provider Organizations:** Physicians, pharmacists, nurse-practitioners, other mental health professionals; Medicaid managed care organizations, mental health clinics, and other provider organizations that deliver care for children and adolescents.
- **Other Nongovernmental Health Care Leaders at State and Local Levels:** Members of professional societies, provider associations, quality improvement associations, voluntary health organizations, business coalitions, community organizations, consumer groups, research analysts, and others who want to stimulate action on health care quality improvement at the State level.

What is the Structure and Organization of the Report and Resource Guide?

The *Report and Resource Guide* is divided into sections that can be read separately to assist the reader in easily finding specific and relevant information so that one can understand the measures and trends and be able to reproduce similar utilization numbers and rates using definitions and templates. The sections are organized as follows:

- Section 1: Background—Provides background on issues in use of antipsychotic medications in children and adolescents as context for the issues of “too many, too much, too young” identified by the Medicaid Medical Directors.
- Section 2: Methods and Project Timeline—Discusses methods and processes so that a State can assess the resources and timelines needed to analyze their own data and practices.
- Section 3: Data—Describes the pooled estimates from State analyses of antipsychotic utilization among fee-for-service (FFS) Medicaid youth in 16 States.
- Section 4: Interventions/State Practices—Discusses State-specific practices related to antipsychotic treatment, classified by the States as mature, promising, or emerging.
- Section 5: Change Management—Discusses system strategies for improving quality, employing a systematic approach for using data to collaborate with local mental health leaders, contractors and prescribers.
- Section 6: Lessons Learned— Describes how States can work together going forward to address quality and safety issues in children, adolescents and adults using antipsychotics and other mental health medications.

Epilogue: Consequences of Participation— Describes the impact and consequences of State participation in the project, based on follow-up interviews conducted in September and October of 2009.

State Practices Attachment: Provides State-supplied descriptions of practices designed to address issues of AP medication prescribing. Each State’s practices are presented using a standard format with standard information elements detailing 36 mature, promising, and emerging practices.

Data Dictionary: Data dictionary used to provide a common framework for the States’ analyses of rates and trends of AP and mental health medication use utilizing their claims files. It includes a tool to facilitate comparison of State-specific features to those of the 16 States in this project.

Blank Excel Spreadsheets: Provides a set of blank downloadable Excel spreadsheets to recreate the various data tables.

National Drug Codes: An Excel workbook providing the National Drug Codes used for this project.

Challenges

It is important to note that during the planning process many measures were proposed and considered. The measures utilized were selected based on feasibility of implementation by State data analysts under the substantial constraints of resources and time available for this project, which limited the complexity of measures that could be calculated. To test these differing measures, Washington State computed the measures using their data, and other States tested whether their claims systems had a similar capacity. After several months of testing, the project participants arrived at a set of five core measures (age, AP dose, two poly-pharmacy measures, and gaps in prescriptions) based foremost on feasibility of capturing the measures from the majority of the participating State claims systems, given the constraints of time and data analysis resources under which this exploratory project operated. The validity of the measures was secondary. For example, as an exploratory measure of poly-pharmacy that could be easily computed by States, we examined use of multiple medications over a calendar year, rather than undertaking the more complex analyses that would be required to estimate concurrent use of multiple medications at a point in time, which is an aim of the collaborators for a subsequent stage of work. Similarly, the “gaps in adherence” measure represents an exploratory analysis that is a first step toward more sophisticated measurement of adherence to medication regimen, which will be of increased importance as work is extended to the population of Medicaid adults with chronic mental illnesses. For high AP dosing, age, and use of multiple APs and MHDs, we chose the Texas Foster Care standards, which are a set of consensus standards developed by the State of Texas to guide practice in this area. Also, while information from States is reviewed in a parallel fashion throughout the *Guide*, definitive comparisons and generalizations among States cannot be made because a variety of local factors, such as population mix, statutes, rules, and secular trends that influence utilization numbers. Perhaps more importantly, analyses were

conducted in parallel by individual States using separately developed statistical programs and coding.

While this distributed model made for less ability to conduct statistical analysis and adjust for differences in the State populations, it allowed more States to participate in this exploratory work by reducing the time that would likely have otherwise been required to implement data sharing agreements. While the data dictionary provided definitions for the measures, and a common set of indicators, it should be noted that variations in details of inclusion criteria, mix of eligibility categories, differences in diagnostic profiles and clinical characteristics, and other cross-State variations limit the inferences that can be drawn from the raw State-to-State differences in our analyses. These were not adjusted for differences in diagnostic and other characteristics of the State populations as is planned for future analyses. For example, the clinical makeup of the population of children and adolescents receiving FFS Medicaid (on which the States' analyses focused) varies from State to State. There are variations in managed care enrollment and procedures across States that influence the composition of the child and adolescent FFS Medicaid population, which includes higher concentrations of children with disabilities, foster care children, and other subgroups at higher risk of mental health problems in some States than in others. There are also a variety of program and policy differences that affect comparability.

It is also important to note that the utilization indicators used in this project as flags for potential safety concerns were developed by consensus of the project participants. The indicators would need to be vetted more broadly and their relationship to patient outcomes studied if widespread adoption were desired. In future work, the consortium aims to develop and implement measures that, while more complex to calculate, provide improved measurement of such key constructs as adherence and poly-pharmacy.

Nevertheless, the analyses conducted by each State provided an important step forward. Examination of patterns across and within States represents a first and critical step in understanding observed variations. Further analysis can seek to understand the parameters that underlie the variation, whether related to geography, policy, access to care or provider/population characteristics, and most importantly, which of these variations are associated with better or worse outcomes.

Describing State-specific interventions promotes understanding of how to monitor and manage pharmacy policy and how to work with community partners. Interventions ranging from the "hard edit" (the categorical denial of a prescription fill that falls outside approved parameters) to education and consultation are described in the *Guide*, as well as approaches ranging from stakeholder engagement to State statutes affecting AP use. All these activities are shared in the spirit of transparency and learning with the acknowledgment that their ultimate value remains to be determined, based on locally achieved evidence of outcomes and peer-reviewed publications describing practices and processes.

SECTION 1

Background

Determining the most appropriate approaches to management of AP medication use in children and adolescents is an important and challenging area for both practice and policy. In determining benefits for children and adolescents covered under Medicaid, State Medicaid programs can play a role in shaping clinician and pediatric use of AP medications. In this *Guide*, “AP medications” refers to the following:

- First generation antipsychotic (FGA) medications such as chlorpromazine (Thorazine), haloperidol (Haldol), and perphenazine (Trilafon).
- Second generation antipsychotic (SGA) medications such as risperidone (Risperdal), olanzapine (Zyprexa), and aripiprazole (Abilify).
- In addition, the term “mental health drugs” (MHD) is used to refer to a broader list of psychoactive prescription medications that include the AP medications as well as antidepressants, anxiolytic/hypnotics, mood stabilizers, sedatives, and other drugs used to treat attention-deficit disorder, anxiety, sleep disorders, and other mental health problems.
- The Food and Drug Administration (FDA) approves medications for specific indications. Practitioners may still prescribe FDA-approved medications for other indications—a practice referred to as “off-label” use, which may or may not be supported by clinical evidence. FDA approvals of psychoactive and other medications with indications for children and adolescents under age 18 have changed and will continue to change over time.

Clinical Concerns

Concerns among state staff and other collaborators about the current use of AP medications in children and adolescents included among others:

- The possibility that some children may receive care that is largely limited to medications without receiving adequately comprehensive mental health evaluations and other mental health services appropriate to their needs.
- Concerns about the application of diagnostic criteria for bipolar illness and its impact on antipsychotic use in children and adolescents.
- Aspects of utilization patterns including multiple psychotropic medication prescribing, within and between drug classes; utilization of appropriate dosages; and utilization in very young children, such as those under age 6.
- Relatively high rates of off-label use (particularly in younger children and in other subgroups of special concern such as foster care youth), considering the limited knowledge that is available about long-term effects of AP medications on the developing nervous system.
- Strategies to reduce risks related to the weight gain and metabolic effects associated with SGA medications.

Access to Services

By one estimate, up to 15 percent of children and adolescents under age 18 who have emotional, behavioral, or mental disorders also suffer functional impairment.¹ Only one in five of these children and adolescents receive services from an appropriately trained professional.⁴ Access to treatment is limited, especially in the public mental health systems, largely due to a shortage of child and adolescent psychiatrists.²

Application of Diagnostic Criteria

Beginning in the 1990s, the use of bipolar (BP) illness as a diagnosis evolved rapidly in child psychiatry and primary care. Current efforts seek to distinguish the small number of children whose symptoms closely fit the Diagnostic and Statistical Manual (DSM) criteria for BP from the larger number who have received the diagnosis of BP, but whose behaviors do not closely fit DSM criteria.⁵ The proposed draft DSM-5 recommendations include a new term, “temper dysregulation disorder” which addresses the issue of mood swings and irritability, and perhaps more accurately describes the chronic nature (greater than 12 months) of excessive temper, over-reactions to stress, and the frequency and nature of mood swings in the child than the current DSM-4 criteria. It has yet to be seen if these recommendations will stand and what effect, if any, this new diagnosis will have on AP medication prescribing for children and adolescents.⁶ The uncertainties surrounding the issue of diagnosis and treatment of bipolar disorder in children add to the importance of initiatives to improve the availability of timely information on these issues to support policy and program development at the State level, including the development of metrics and procedures for monitoring and assessing diagnosis and treatment patterns on a continuing basis. Although resource limitations in the current project precluded incorporating diagnostic information from medical claims in the exploratory measures, this represents an area of opportunity for follow-on efforts in the development and implementation of metrics.

Prescribing Patterns and Use of Mental Health Services

The volume of AP medications prescribed for children and adolescents has risen rapidly. During 1993-2002, medical office visits for children and adolescents that included AP medication prescribing increased approximately five-fold.⁷ Although some studies have shown early indications that AP medication prescribing may be leveling off, use remains high compared to historical and cross-national patterns.³ The simultaneous prescription of multiple agents, including those within the same class, often referred to as poly-pharmacy,⁸ has also increased in both adults and children.

An important issue identified in discussions among the participants was the relationship of AP prescribing to the use of and access to appropriate mental health services. Although the strength of evidence varies across conditions and treatments, and published studies of medication efficacy vastly outnumber studies of the use of medication combined with non-pharmacological treatments for children and adolescents, many studies indicate that psychosocial interventions can be effective with conditions for which children are frequently treated with psychotropics.⁹⁻¹⁶ In many instances, optimal treatment may involve the combination of psychosocial and psychopharmacological interventions, but more information is needed on the extent and characteristics of mental health services received by youth treated with medications such as

antipsychotics. Closely related issues concern the extent to which prescribing is preceded by a comprehensive mental health assessment, and the extent of appropriate follow-up monitoring which can be important to assess treatment response, reinforce adherence, and assess side effects such as weight gain. In response to these concerns, as discussed in Section 4 and the State Practices attachment, several of the collaborating States have developed, or are exploring initiatives, such as access to behavioral health consultations and second opinions to address these issues.

Safety

Studying the safety and efficacy of medications in children and adolescents is inherently difficult. There are informed consent and assent issues associated with conducting such studies. Rigorous studies of the effectiveness of APs in children and adolescents are of limited number, compared with studies of their effectiveness in adults. Because AP medications have unknown effects on the developing central nervous system, concerns have been expressed about their rates of use in children and adolescents.¹⁷ Safety issues require analysis of the risk-benefit profile of these agents, specifically the trade-off of possible harm resulting from medications versus the harm of untreated disorders.¹⁸ Safety in children cannot be inferred from adult data.¹⁹ The definition of adverse events and degrees of symptom severity require standardization, as does calculating the NNTB (number needed to treat in order to benefit one additional child) and the NNTH (number needed to be treated to harm one additional child) so that researchers and clinicians may weigh relative costs and benefits of psychosocial and psychopharmacological interventions alone or in combination.²⁰ Pending clinical trials to establish safety and efficacy of drugs now being used off-label, clinicians must monitor children closely.²¹

Evidence-Based Practices

Most evidence of efficacy describes short-term symptomatic improvement. Long-term studies with rigorously defined functional outcomes for children and adolescents are needed. Effectiveness studies conducted in usual care populations and settings characterized by comorbidity and service limitations are also needed.²² For treatment of disruptive behavior disorders and pervasive developmental disorders, definitive data on long-term safety are lacking.²³ Many studies describe effects of mono-therapy, while in the community there is a high rate of combined pharmacological use.²⁴ More research is needed on the comparative effectiveness of psychosocial versus medication-based versus combined approaches across conditions,²⁵ although some studies have shown non-pharmacological interventions to be effective for particular disorders such as posttraumatic stress disorder,²⁶ depression,²⁷ and anxiety disorders.²⁸

SECTION 2

Methods and Project Timeline

Background

The challenges of mental health services in Medicaid were discussed among State Medicaid Medical Directors, State mental health professionals and policymakers, and investigators from Rutgers' CERTs in June 2007 during an AHRQ-supported Medicaid Medical Directors Learning Network (MMDLN) meeting. Out of that discussion, MMDLN and CERTs participants developed a plan for a collaborative project to examine the use of AP medications for children and adolescents in Medicaid. Ultimately, a consortium of 16 States participated, representing a combined enrollment of 12 million children and adolescents in Medicaid.

Scope

As noted in the Introduction, the aims of the collaborative were to conduct exploratory analyses in each State on antipsychotic medication use rates and trends for children and adolescents in fee-for-service Medicaid using a comparable set of indicators that could “flag” possible safety and quality issues; provide a forum for discussion of policies and programs for optimizing AP medication prescribing among States; and develop a compendium of State practices classified by the contributing States as mature, promising and emerging according to a consensually developed classification matrix created for this project by the project participants that could be shared with other States to address AP utilization issues.

The project participants included State Medicaid Medical Directors and State mental health professionals and policymakers. Consensus development among participants was used to define the methodology and plan for data collection. The project included the following milestones:

- A series of informal discussions that generated the project plan.
- A discussion with Medicaid Medical Directors from as many as 23 States pertaining to the project scope and resource needs, which ended with 16 States agreeing to participate given the planned scope and timelines.
- The development of a standardized data dictionary with a subset of State participants.
- An informal data sharing agreement among 16 States to pull and share utilization and demographic data.
- Compilation of information on policies, statutes, and utilization controls related to mental health medications in a State.
- A set of definitions for State practices categorized as mature, promising, and emerging.
- A two-day meeting bringing participating States together to discuss data and trends.
- Calculation of pooled estimates from the State level analyses.
- Creation of a publication committee to write and review a resource guide for States wishing to understand their data and program characteristics.

SECTION 3

Data—Interpreting State Estimates of Utilization and Trends

Project Population

Medicaid covers 25 million children and adolescents less than 21 years of age through a number of programs including the State Children’s Health Insurance Program (SCHIP), providing health care to some of the most vulnerable children in the United States. Health care services are provided through managed care contracts, or through FFS direct payment for services of health care providers. Although the mix of managed care and FFS differs by State, children with the most severe mental health issues are often enrolled in FFS, such as those who are in foster care, Supplemental Security Income participants eligible for Medicaid based on disability, and those with developmental disabilities,²⁹ a fact that is important to consider in interpreting data on this population.

We evaluated trends in the FFS Medicaid population (excluding the small number of Medicaid children and youth who are dually eligible for Medicare and Medicaid) in 16 States, comparing four years of pharmacy claims data capturing AP medications. The retrospective study concentrated on AP medication use but also captured claims for a broader group of prescription mental health drugs (MHDs) during calendar years 2004–2007. For the purpose of these analyses, MHDs included AP medications, attention-deficit hyperactivity disorder (ADHD) drugs, antidepressants, anxiolytic/hypnotics, mood stabilizers, and others, as defined by agreement among project participants. The Medical Directors agreed that these medications represent the typical utilization of mental health drugs in this population.

In 2007, the project involved a total Medicaid population of about 12 million children age 18 and younger. Thirteen States were able to report results for their foster care populations, totaling 285,756 children (Table 1).

AP Utilization

The tables below reflect pooled results from States’ analyses of medication use rates (proportion with a filled prescription during the calendar year) for the years 2004 and 2007, for FFS children and adolescents aged 18 years of age or younger, in the 16 participating States. In 2007, a total of 193,178 of these beneficiaries received an AP prescription, representing 1.60 percent of the total FFS population under 19 years of age (Tables 1 and 2). Variation across States was considerable, ranging from 0.9 percent to 4.1 percent.

Thirteen States were able to report on their foster care populations. In this population in 2007, the rate of AP medication use was higher at 12.37 percent, in contrast to the 1.40 percent rate for children not in foster care (Table 2).

Male beneficiaries were more than twice as likely as female beneficiaries to be prescribed an AP medication (2.23 percent vs. 1.05 percent). AP medication use rates increased with age and varied between eligibility categories, ranging from 0.61 percent for SCHIP to 13.44 percent for the aged, blind, and disabled (ABD) population of children 18 years or younger.

From 2004 to 2007, the pooled AP medication use rate for children and adolescents in the 16 participating Medicaid programs increased from 1.45 percent to 1.60 percent in 2007, about a 10 percent relative increase. For foster care children and adolescents, the AP medication use rate increased (on a relative basis) by 5.6 percent between 2004 and 2007 (from 11.7 percent to 12.4 percent). In comparison, the rate among non-foster care children underwent a relative increase of 12 percent, from 1.25 percent in 2004 to 1.40 percent in 2007.

Table 1: Number of Beneficiaries in Study Population and Number Receiving Antipsychotic Prescriptions, 2007 and 2004

	2007			2004	
	States Reporting (n)	Total Clients (n)	Total AP Users (n)	Total Clients (n)	Total AP Users (n)
Total	16 States	12,063,667	193,178	12,037,000	175,069
Gender¹	15 States				
Male		5,215,718	116,528	5,314,288	106,236
Female		5,061,247	53,172	5,180,777	49,134
Age	16 States				
≤5		5,170,441	11,183	5,108,573	11,965
6-11		3,324,471	66,725	3,360,602	61,449
12-14		1,472,281	48,423	1,549,926	46,836
15-18		1,927,550	66,847	1,832,623	54,820
Eligibility²	14 States				
ABD ⁴		410,325	55,149	379,462	45,164
TANF ⁵		8,006,931	86,397	7,494,449	75,433
SCHIP ⁶		1,117,344	6,849	681,384	7,144
Other		2,182,583	70,361	2,631,950	70,015
Foster Care³	13 States				
Yes		285,756	35,351	278,764	32,652
No		9,111,427	127,965	9,024,285	113,234

¹ For all States except Illinois. States reported 60,167 missing gender cases for 2007 and 62,340 for 2004.
² For all States except New Hampshire and New York.
³ For all States except New Hampshire, New York, and Oklahoma.
⁴ ABD=Aged, blind, and disabled children and adolescents aged 18 years or younger
⁵ TANF=Temporary Assistance for Needy Families
⁶ SCHIP=State Children’s Health Insurance Fund

Table 2: Antipsychotic Medication Utilization Rates (2007 and 2004)*

	States Reporting (n)	2007 AP Use Rate (%)			2004 AP Use Rate (%)		
		Pooled	Min	Max	Pooled	Min	Max
Total	16 States	1.60%	0.90%	4.10%	1.45%	0.90%	3.33%
Gender¹	15 States						
Male		2.23%	1.33%	5.61%	2.00%	1.26%	4.58%
Female		1.05%	0.58%	2.63%	0.95%	0.53%	2.17%
Age	16 States						
≤ 5		0.22%	0.02%	0.67 %	0.23%	0.05%	0.49%
6-11		2.01%	0.94 %	4.95%	1.83%	0.91%	4.00%
12-14		3.29%	2.05%	7.58%	3.02%	1.90%	6.56%
15-18		3.47%	2.00%	8.31%	2.99%	1.58%	7.24%
Eligibility²	14 States						
ABD ⁴		13.44%	8.10%	23.39%	11.90%	7.35%	21.60%
TANF ⁵		1.08%	0.30%	3.57%	1.01%	0.24%	3.45%
SCHIP ⁶		0.61%	0.20%	3.28%	1.05%	0.23%	2.53%
Other		3.22%	1.05%	13.62%	2.66%	0.81%	33.54%
Foster Care³	13 States						
Yes		12.37%	5.80%	22.25%	11.71%	5.40%	23.67%
No		1.40%	0.69%	3.25%	1.25%	0.63%	2.72%

* Sum of AP medication users (numerator) in all States divided by the sum of clients (denominator) in all States.

¹ For all States except Illinois. States reported 60,167 missing gender cases for 2007 and 62,340 for 2004.

² For all States except New Hampshire and New York.

³ For all States except New Hampshire, New York, and Oklahoma.

⁴ ABD=Aged, Blind, and Disabled children and adolescents aged 18 years or younger.

⁵ TANF=Temporary Assistance for Needy Families.

⁶ SCHIP=State Children's Health Insurance Fund.

Medicaid Programs and Populations Served

Most States had a combination of FFS and managed care programs. The size of the FFS programs ranged from just over 12,017 beneficiaries to more than 2.45 million. Proportions of enrollees in different eligibility categories varied widely across States. For example, among FFS enrollees the proportion of children and adolescents in foster care varied from less than one percent to nearly half (data not shown).

Core Measures

In addition to the characterization of AP medication use for children and adolescents in the 16 Medicaid States, the project participants consensually identified five core measures of AP medication and total MHD utilization that served as preliminary measures to flag potential quality and safety issues in AP medication and total MHD therapy:

- Use of AP medications in children 5 years and younger;
- Use of high doses of AP medications;
- Use of multiple AP medications any time during a calendar year (including both concurrent and non-concurrent use);
- Maximal gap in days between AP medication claims, which may reflect medication adherence; and
- Use of multiple MHDs any time during a calendar year (including both concurrent and non-concurrent use).

Many of these core measures stem from the Texas Foster Care Study and from a consensus based on discussion among project participants on dose, age and poly-pharmacy standards, which participants agreed to accept as a base for the project. With respect to dose, the Texas study did not contain a dose recommendation for all ages for all the AP drugs. The participants agreed to use the dose recommendations for adolescents as a base for comparison across age, eligibility and other demographics (Table 3). Each measure was calculated for the calendar years 2004 through 2007 to allow for the evaluation of both pooled rates and trends (Table 4). In the pooled results below, we report on the results for 2004 and for 2007.

	Max Dose (mg per day)
Aripiprazole	30
Clozapine	600
Haloperidol	10
Olanzapine	20
Perphenazine	32
Quetiapine	600
Risperidone	6
Ziprasidone	180

Table 4: Study Population Exceeding Flags Indicating Potential Safety or Quality Issues

Flags	2007				2004				
	Total Users (n)	Average Use Rate (pooled) ¹	Min (%)	Max (%)	Total Users (n)	Average Use Rate (pooled) ¹	Min (%)	Max (%)	
AP Medication Use in Children 5 years and Younger²									
≤ age 5	11,183	0.22%	0.0%	0.7%	11,965	0.23%	0.1%	0.5%	
≥ High Dose, Among AP Users^{2,3}									
< Max	214,866	91.1%	82.1%	98.7%	199,364	91.5%	83.6%	99.3%	
≥ Max	21,049	8.9%	1.3%	17.9%	18,602	8.5%	0.7%	16.4%	
≥ 2X Max	2,459	1.0%	0.0%	2.9%	2,754	1.3%	0.1%	2.6%	
Multiple AP Medication by Age in a Calendar Year, Among AP Users⁴									
<19	One	142,498	79.5%	73.9%	83.6%	122,676	76.9%	72.5%	80.9%
	≥ Two	36,775	20.5%	16.4%	26.1%	36,914	23.1%	19.2%	27.5%
≤5	One	8,177	85.2%	80.3%	94.7%	7,374	83.3%	0.0%	88.6%
	≥ Two	1,433	14.8%	5.3%	19.8%	1,484	16.8%	0.0%	22.2%
6-11	One	50,398	80.4%	75.5%	85.1%	44,646	77.8%	73.3%	81.9%
	≥ Two	12,322	19.6%	15.0%	24.6%	12,739	22.2%	18.1%	26.7%
12-14	One	35,797	78.8%	72.5%	82.3%	33,039	75.9%	70.4%	81.4%
	≥ Two	9,643	21.2%	17.7%	27.5%	10,478	24.1%	18.6%	29.6%
15-18	One	48,125	78.2%	70.7%	85.1%	37,617	75.5%	71.4%	80.5%
	≥ Two	13,555	21.8%	14.9%	29.3%	12,233	24.5%	19.5%	28.6%
Maximal AP Gap in Prescription Claims (days), Among AP Users⁵									
0	20,113	13.7%	2.4%	28.7%	19,950	15.1%	2.3%	34.9%	
>20	58,640	39.9%	23.3%	48.3%	51,810	39.3%	25.3%	49.1%	
>40	31,072	21.1%	9.4%	27.8%	26,860	20.3%	9.8%	26.9%	
Multiple Mental Health Drugs Medications in a Calendar Year⁶									
One	318,099	52.5%	37.2%	63.1%	316,714	51.9%	43.6%	61.5%	
≥ Four	66,224	10.9%	4.6%	19.9%	71,767	11.8%	4.7%	16.4%	

1 Sum of users (numerator) in all States divided by the sum of clients (denominator) in all States.

2 Among children with ≥1 month eligibility to FFS Medicaid per calendar year.

3 Based on reference levels in Table 3 above. See *Use of Psychoactive Medication in Texas Foster Children, State Fiscal Year 2005*. Prepared by the Texas Health and Human Services Commission, Department of State Health Services, and Department of Family and Protective Services. June 2006.

4 Among children with ≥6 months eligibility to FFS Medicaid per calendar year.

5 Among children with ≥6 months consecutive eligibility to FFS Medicaid per calendar year.

6 Among children with ≥6 months eligibility to FFS Medicaid per calendar year.

Results

Use in AP Medications in Children Five Years and Younger. Overall, 11,183 children age 5 years or younger had a claim for an AP medication in 2007. This represents a use rate of 0.22 percent among children under 6 years old. Use rates ranged across States from 0.02 percent to 0.67 percent. The rates for 2004 and 2007 were similar (.23 percent in 2004 and .22 percent in 2007 for a slight relative decline of 4 percent).

Use of High Doses of AP Medications. These analyses are exploratory and did not utilize maximum dosage levels that varied by the child's age; future work is planned to refine these exploratory analyses. Since most of the AP medication uses for children and adolescents were off-label during the study period, and therefore FDA guidance on dosing ranges for these uses was not available, project participants agreed to use dosing thresholds developed by the Texas prescribing /provider community for a separate project (Table 3). There were 21,049 children and adolescents in 2007 with an AP medication claim at or above a maximum dose as defined by the Texas Foster Care report³⁰ (Table 2) (8.92 percent of children with ≥ 1 AP medication claim) and 2,459 children (1.04 percent of children with ≥ 1 AP medication claim) at or above two times the maximum dose (Table 3). There were large variations across States for high doses of AP medication claims, ranging from 1.3 percent to 17.9 percent at or above the maximum dose, and from 0.01 percent to 2.9 percent at or above two times the maximum dose. Compared with 2004, the rate of AP medication use at or above the maximum dose increased from 8.53 percent to 8.92 percent. Over the same time period, rates at doses at or above two times the maximum decreased from 1.26 percent to 1.04 percent. An appropriate source was not readily available for age-specific thresholds. Individual States examined their data on an age-stratified basis, interpreting results in the context of the age range, using more detailed dosing ranges ranging from less than one-quarter of maximum to more than five times maximum. Table 4 above provides a summary presentation of the pooled data, without age stratification. These pooled results constitute a conservative estimate of high-dose utilization, since a single threshold from the Texas foster care report (typically representing a maximum dose for 12 to 18 year olds) was applied to children of all ages.

Use of Multiple AP Medications During a Calendar Year. The use rate of multiple AP medications, defined as claims for two or more filled prescriptions for different AP medications any time during a calendar year, decreased from 23.1 percent of AP users in 2004 to 20.5 percent in 2007. Multiple AP rates reflect both concurrent and non-concurrent utilization. Concurrent use was not within the data-analytic capability of many States within resources available, so we used for exploratory purposes a simpler measure reflecting use of more than one AP medication within the calendar year (not necessarily concurrent). This measure often reflects the result of medication switches, such as those in response to side effects or lack of response, rather than intended poly-pharmacy. Collaborating States discussed the development of measures of concurrent use, building on measures that have been developed in some States. Further development of States' capacity to calculate more complex measures (e.g., concurrent use), and development and validation of such measures for use across States, was identified as an important area for follow-on work.

Maximal Gap in Days Between AP Medication Drug Claims. As a rough proxy for AP medication adherence, we calculated the maximum gap in supply between consecutive AP

medication claims within a calendar year. A gap of greater than 20 days was considered a potential marker for poor adherence. Pooled results for 2007 indicate that the proportion of AP medication users with a gap of more than 20 days was 39.9 percent with a range of 23.3 percent to 48.3 percent. Between 2004 and 2007, the proportion of children and adolescents with AP medication claims with a gap of more than 20 days remained largely unchanged (rate for 2004: 39.3 percent). Further development of proxy measures for adherence, and State capacity to calculate such measures, was identified as an important topic for subsequent work on quality metrics.

Use of Multiple Mental Health Drugs (MHD) During a Calendar Year. This project also examined utilization of multiple (four or more) MHDs any time during a calendar year. For the purpose of these analyses, MHDs included AP medications, ADHD drugs, antidepressants, anti-anxiety medications, mood stabilizers, and others, as defined by a consensus panel that agreed that these medications represent the typical utilization of mental health drugs in this population. As with use of multiple antipsychotics, we did not undertake to measure concurrent use as this was not within the data-analytic capacity of many States within the time and resources available. Between 2004 and 2007, the rate of MHD users with four or more MHDs decreased from 11.8 percent to 10.9 percent. Further work will explore concurrent use of medications from multiple classes.

Pharmacy Program Structures and Policies. States varied in terms of the populations covered, organizational structure, mental health contracts, statutes, and codes. To characterize differences between programs, States were asked to provide information about their structure. The questions were directed at categorizing State policies and practices related to AP medication management and included the following:

- Medicaid programs and populations served;
- Pharmacy program structure and policy development;
- Pharmacy policies; and
- Pharmacy program outcome monitoring and feedback.

This information was collected during the period from March 2009 through September 2009.

Policy Development and Controls. While pharmacy policy decisions were generally within the province of the Medicaid program itself, input from the State mental health agency or authority varied across States. Most States had one or more capitated contracts covering mental health service. However, in most cases costs of psychotropic medications were carved out from these capitations and paid by the State. A majority had a Maximum Allowable Cost (MAC) program for AP medications and received supplemental rebates for AP medications. States are federally mandated to have Drug Utilization Review (DUR) programs for Medicaid and some States also utilize Pharmacy and Therapeutics Committees to monitor the quality and efficiency of their Medicaid programs. There are a range of different controls and policies that States use to manage their pharmacy programs. Some policies are implemented by pharmacies at the point of filling the prescription through the use of prior authorization (PA), step therapy, or second opinion programs. Some States use prior authorization to enforce preferred drug lists (PDL). Other State policies are designed to improve the efficiency of the Medicaid program, including

generic substitution, generic first start, days supply restrictions (e.g., 15 days for first prescription, 30 days thereafter), pill splitting requirements, and frequency restrictions (e.g., once daily dosing). Some States had prospective policies in place to address quality and safety concerns, including age restrictions, dose restrictions, and combination restrictions. Many States had “grandfathering” or refill protections—allowing for existing prescriptions to continue to be filled when new policies were introduced. Table 5 provides a summary of these results.

Feedback to prescribers and mental health programs was a strategy employed by many States. A majority had used some form of prescriber report cards with individual prescriber AP medication utilization compared to a peer group. A few States incorporate AP medication metrics within their mental health contracts.

Table 5. Number of States with Pharmacy Controls/Regulations by Specific AP Medication															
	Prior Authorization	PDL-Preferred	PDL-Non-Preferred	Provider Type Restriction	Step Therapy	Refill Protections Guidelines	Second Opinions	Age Restrictions	Dose Restrictions	Combination Restrictions	Supplemental Restrictions	Generic First for AP (planning)	Fixed State Maximum Allowable Cost	Total	
First Generation AP Medications (FGAs)															
Chlorpromazine/HCL	0	3	0	0	0	1	2	0	1	3	2	1	4	1	18
Fluphenazine decanoate/HCL	0	3	0	0	0	1	2	0	1	3	2	1	6	1	20
Halperidol/decanoate	0	3	1	0	0	1	2	0	0	3	2	1	5	1	19
Loxapine HCL/succinate	0	3	1	0	0	1	2	0	0	3	2	1	5	1	19
Mesoridazine besylate	1	1	1	0	0	2	1	0	2	2	2	1	2	1	16
Molindone HCL	0	2	0	0	0	1	2	0	0	3	2	1	3	1	15
Perphenazine	0	3	1	0	0	1	2	0	1	3	2	1	4	1	19
Pimozide	0	2	1	0	0	1	2	0	0	3	2	1	2	0	14
Thioridazine/thioridazine HCL	0	3	0	0	0	1	2	0	1	3	2	1	4	1	18
Thiothixene/thiothixene HCL	0	3	1	0	0	1	2	0	0	3	2	1	5	1	19
Trifluoperazine HCL	0	3	0	0	0	1	2	0	1	3	2	1	4	1	18
Triflupromazine	1	2	0	0	0	1	2	0	0	2	2	1	1	1	13
FGAs Total	2	31	6	0	0	13	23	0	7	34	24	12	45	11	208
Second Generation AP Medications (SGAs)															
Aripiprazole	0	6	1	0	0	2	3	1	2	6	5	2	0	0	28
Clozapine	2	4	3	0	1	2	3	1	2	5	4	2	5	2	36
Olanzapine	3	3	4	0	1	2	3	1	2	6	5	1	0	0	31
Olanzapine + fluoxetine (Symbyax)	4	3	4	0	1	2	3	1	1	5	4	1	0	0	29
Paliperidone	4	4	3	0	1	2	3	1	1	6	5	1	0	0	31
Quetiapine fumarate	1	6	0	0	0	2	3	1	3	6	5	2	0	0	29
Risperidone	0	6	0	0	0	2	3	1	3	6	4	2	5	2	34
Risperidone inj.	1	4	2	1	0	3	3	1	3	6	5	1	0	0	30
Ziprasidone HCL	1	5	1	0	0	2	3	1	2	6	5	1	0	0	27
SGAs Total	19	77	24	1	4	34	54	9	27	91	70	27	60	17	514
Combined Total	21	108	30	1	4	47	77	9	34	125	94	39	105	28	722
*A number in a cell indicates the number of states that have a policy for the drug and/or class															

Discussion and Limitations

Results of this multi-State effort to monitor utilization and potential safety issues for AP medication prescriptions using the claims systems of 16 States indicate that pharmacy claims can provide useful information across multiple States when using a common data dictionary, although further work is needed to increase and assure comparability across states. A key next step is to incorporate information from medical claims so that, for example, states can track diagnoses associated with antipsychotic prescribing. States' analyses provided them with information on several aspects of AP medication use in their state, including use in very young children, multiple AP medications prescribed for children in a calendar year, and a measure of refill gaps. Additionally, the data highlighted variations in both inter- and intra-State prescribing practices, although further analysis would be required to understand more clearly the contribution of case-mix and other factors in these variations.

Certain factors limit the general applicability of the data and conclusions that can be drawn from this project. The analyses for this project incorporated no clinical or diagnostic information. Some States had difficulty stratifying AP medication use by gender and eligibility groups (e.g., foster care). We were not able to examine other important potential factors related to the implementation or outcomes of AP medication use, including patient, family or provider preferences. The project was limited to children in the FFS Medicaid program and may not generalize to other populations. Outcomes related to other human services systems (e.g., juvenile justice activity, school attendance, etc.) were not measured and should be examined in future research. Our data appeared to show an increase in use of AP medications in some subpopulations, but additional information would be necessary in order to evaluate the medical necessity of these treatments. Further systematic analysis is planned in several States to examine the reasons for these observed trends.

Participating States described a wide variety of approaches to managing their pharmacy programs. Many States introduced new policies and programs over the study period including steps aimed at addressing issues of dose, age, and poly-pharmacy (i.e., multiple AP medications and MHDs) through prior authorization. Several of these initiatives were developed as a result of participation in this initiative, as discussed in Section 4. In general, the programs recorded by this study were too new to show a relationship to the 2004-2007 utilization data.

In interpreting these FFS utilization data, it is important to bear in mind the information discussed above (see Challenges section of the Introduction). As noted, data reflect populations of FFS beneficiaries whose composition varies across States, depending in part on varying eligibility procedures and managed care programs, and the measures were selected based on simplicity and feasibility of implementation by data analysts in the individual States under the resource and time constraints available for these exploratory analyses. We have not yet, for example, undertaken to measure simultaneous use of multiple medications or medication possession ratios as a proxy for adherence. The distributed data analysis model allowed multiple States to participate without the need to implement data use agreements, but it also limited the ability to perform iterative or multivariate analyses, adjust for clinical, eligibility, and other characteristics, or examine patterns in subgroups with different diagnoses, which are goals for subsequent stages of the work. While the data dictionary provided an overall template for State analyses, application of rigorous procedures for consistent distributed data analysis, such as use

of common statistical programs and coding, was not feasible. However, the pooled data provide useful insights into trends in antipsychotic use in Medicaid youth and variations across important subpopulations such as age groups, genders, and eligibility categories including foster care. The data also represent important first stages in a process intended to facilitate effective use by States of their claims data to understand and monitor treatment practices going forward, as well as to examine and compare treatment patterns and outcomes utilizing more refined and rigorous analytic procedures in subsequent collaborative work.

Notwithstanding these limitations, work on this project demonstrated the effective use of pharmacy claims data to explore utilization of AP medications and mental health drugs across multiple State Medicaid programs. Perhaps more importantly, it showed that State programs could work together to develop and use data definitions and measures for potential safety and quality issues (age, dose, multiple drug exposure, and adherence gaps) to highlight trends and monitor across State practices. This work has helped participating States begin to utilize their data more effectively to understand patterns of AP medication use in their programs. Identification of characteristics of and variations in prescribing for subpopulations of special concern, such as foster care children, has helped to focus efforts on quality improvement in these populations. The work has also highlighted the need for better-resourced collaborative efforts to develop and implement metrics and quality improvement initiatives. These efforts have the potential for considerable public health impact in improving pediatric mental health treatment and outcomes in the vulnerable populations served by the Medicaid programs.

SECTION 4

Interventions—Learning from State-Specific Practices

This section includes brief examples of State practices/programs that encourage appropriate prescribing of antipsychotic medication for children and adolescents. Detailed descriptions of the full 36 State practices can be found in the State Practices attachment. Every state contributed one or more practices. States described their practices using a standard template that included:

- Background
- Development timeline
- Program cost/ Funding source
- Measures results
- Outcomes
- Lessons learned

State practices were then categorized based on the type of broad implementation strategy utilized. The strategic categories with descriptive examples follow.

- **Policy:** Statute/administrative code modification related to AP medication prescription sharing.
- **Stakeholder Engagement:** Creation of multi-stakeholder task forces or workgroups to collaboratively address AP medication utilization.
- **Education/Marketing:** Coordination of efforts such as electronic handheld device programs, Web-based communications, consultation/training programs, consumer education, road shows, and academic detailing about AP medication prescribing.
- **Provider-Patient Feedback:** Patient/provider-specific feedback, report cards.
- **System Interventions:** Pharmacy requirements such as criterion-triggered second opinions, medication therapy management, rate setting, clinic-based quality improvement, prior authorization, electronic information exchange. Other interventions include PDL Programs, Maximum Allowable Cost/Rebate programs, Pay for Performance, and e-prescribing.

Finally, States ranked their practices as mature, promising, or emerging based on a State Implementation Strategies Classification Matrix (Table 2) that was developed for this project by the publications committee. The criteria are listed below:

- Evidence
- Maturity
- Dissemination
- Cost Effectiveness
- Access
- Acceptance
- Implementation

Table 1. State Practices

State	Strategy Description	Classification	Category
Missouri	Treatment Adherence Program (TAP)	Promising	Policy
Washington	Mental Health Law and Confidentiality	Emerging	Policy
Washington	Generics First	Promising	Policy
California	Medication Therapy Management Services (MTMS)	Emerging	Stakeholder
California	CalMEND Collaborative Performance Improvement Project	Promising	Stakeholder
California	Stakeholder Engagement in Development and Implementation of CalMEND	Emerging	Stakeholder
Indiana	Mental Health Quality Advisory Committee	Promising	Stakeholder
Massachusetts	Working Group on Psychoactive Medication for Children	Emerging	Stakeholder
New York	PSYCKES, Clinic-Based Continuous Quality Improvement and Drug Utilization Review	Promising	Stakeholder
Oregon	Psychotropic Medication Utilization Management	Unclassified	Stakeholder
Texas	Psychotropic Medication Utilization Parameters	Promising	Stakeholder
Alabama	Stakeholder Engagement/Management & Consensus Building Interventions	Emerging	Education
California	Epocrates (Education/Marketing)	Promising	Education
Colorado	Medicaid Rx Review Program	Unclassified	Education
Massachusetts	Public Education	Emerging	Education
Missouri	Road Shows for Behavioral Pharmacy Management (BPM)	Emerging	Education
Missouri	Access to Consultation in Behavioral Pharmacy Management (BPM) Initiative	Mature	Education
Washington	Evidence-Based Mental Health Care	Mature & Promising	Education
California	Relationship of Poly-Pharmacy Rate to Practice Setting	Emerging	Feedback
California	Pharmacy Tool Kit	Emerging	Feedback
Colorado	Comprehensive NeuroScience (CNS) Program	Promising	Feedback
Maine	Academic Detailing	Emerging	Feedback
Maine	Report Cards	Emerging	Feedback
Massachusetts	Access to Consultation—MCPAP	Mature	Feedback
Missouri	Benchmark Reporting in BPM Intervention	Mature	Feedback
Oklahoma	SoonerPSYCH Behavioral Health Rx Management	Promising	Feedback
Oklahoma	SoonerCare Medical Risk Management	Emerging	Feedback
Washington	Provider Access Lines (Phone-Based Consultation)	Promising	Feedback
California	Use of the Web	Promising	Systems
Colorado	Use of the Web	Unclassified	Systems
Maine	Edits at Point of Sale	Promising	Systems
Missouri	Prior Authorization of ADHD Medications	Unclassified	Systems
New Hampshire	E-Prescribing	Emerging	Systems
New York	PSYCKES—Prior Authorization and Feedback	Promising	Systems
Pennsylvania	Prior Authorization of Olanzapine	Mature	Systems
Washington	Second Opinions	Mature	Systems

Policy

Statutes and Administrative Code on AP Prescription Sharing: *Washington*

- Washington State law required a release from the patient before sharing the mental health record. The mental health record definition extended to mental health medications, such that one prescriber of an AP medication could not know what another prescriber of a second AP medication was doing for a single patient unless a release was signed for both prescribers' records to be shared. In July 2007, legislation was passed which permits prescribers to share mental health prescription and diagnosis information contained in the medical claims file.

Stakeholder Engagement/Management

Task Force/ Working Group Creation: *California, Massachusetts, Texas*

Three States have either instituted or planned efforts to engage stakeholders in educational and/or therapeutic management activities:

- California established a client-oriented Clinically Informed Outcomes Management (CIOM) system within their broader California Mental Health Care Management (CalMEND) system with the goal of encouraging client participation in care plan management. CIOM is a Web-based, real-time electronic survey form executed at each visit before the client meets with the practitioner. Because the form is online, the results are immediately available to the practitioner during the visit.
- California established CalMEND, the California Mental Health Care Management Program in 2005. Since institution of the Web site, there has been an increase in both the number of visits and the average length of time spent on the site by stakeholders.
- Texas recognized high use of psychotropic medications among children in foster care and developed a focused program to monitor and optimize care in this population. They implemented personal health records for Medicaid clients who constitute the STAR health network and an online "passport" was developed that contains demographic data, immunizations, prescriptions, encounter data, diagnoses and medication allergies. Monitoring of these data permits review of cases outside of parameters identified by an interagency council.
- Massachusetts established a stakeholder-based work group to analyze pediatric utilization of psychotropic medications after the death of a four-year-old girl diagnosed with ADHD and bipolar disorder. The group identified practice outliers in psychopharmacological administration and in comprehensiveness of treatment. Trends and utilization are now being monitored as a statewide collaborative initiative.

Education/Marketing

Access to Consultation Programs: *Alabama, Missouri*

- To address the issue of the steadily increasing use of second-generation antipsychotics, Alabama convened a task force comprised of child psychiatrists, primary care physicians,

pharmacists, State agency representatives, and other payers to gather input from multiple sources and to design effective interventions. The task force agreed on two interventions: focused mailings to prescribers of any antipsychotic to children aged 0-17, and the educational telephone calls by child psychiatrists to prescribers of antipsychotics to children under the age of 5.

- Missouri uses its Behavioral Pharmacy Management system to analyze prescribing patterns for children and adolescents, after which letters are sent to prescribers offering consultation on best prescribing practices. Analysis of experience with this intervention showed that repeated messaging produced increased benefit over time as measured by an overall reduction in the percentage of outlier prescriptions by Community Mental Health Centers (CMHCs).

Use of the Web: *California, Massachusetts*

- California developed a Contract Drug List for Medi-CAL patients, and loaded its list to the mobile pharmacy database Epocrates in January 2007. The Epocrates software permits the viewing of coverage data as well as alternatives to drugs with utilization limits and constraints.
- Massachusetts separately maintains an online and hard-copy educational document for public education for parents, guardians and social workers. The document is periodically updated and focuses on both information about psychotropic medications and the broader context of the assessment of children's behavioral and emotional problems.

Feedback

Patient-Provider Feedback: *Colorado, Maine, Washington, Massachusetts*

- Massachusetts developed a program (Massachusetts Child Psychiatry Access Project [MCPAP]) to provide telephone consultative support by child psychiatry specialists to pediatricians. It is regional, flexible and supportive across all payers. The calls go to one of five regions determined by the home of the patient. This triage facilitates face-to-face consultation when indicated. The distribution also prevents specialists from becoming overburdened. The program has been in place since 2003 with strong acceptance by the pediatrician community.
- Washington began a telephone access consultation (Partnership Access Line [PAL]) similar to that of Massachusetts; however, the consultations are provided centrally by one source rather than regionally. The program has an ambitious evaluation component; the preliminary results indicate strong acceptance by the pediatrician community.
- Colorado engaged in a two-year program that used the services of a vendor, Comprehensive NeuroScience (CNS), to administer a Behavioral Pharmacy Educational (BPE) program. BPE provided educational alerts and letters to prescribers detailing information about the psychiatric medication utilization of their patients. Prescribing patterns post-intervention were followed and, if desirable changes did not occur, follow-up letters and face-to-face encounters with peer consultants were held.
- Maine initiated a report card program to inform prescribers by auto-fax of lapses in prescription filling. Also, the State's pharmacy management contractor (GHS) sends

quarterly reports to prescribers with at least 20 Medicaid patients, documenting the level of compliance with the PDL.

System Interventions

Criterion-Triggered Mandatory Second Consultations (Opinions): *Washington*

- Washington initiated a program to require a second opinion from a community psychiatrist when prescriptions for ADHD medications exceeded consensus-defined safety thresholds based on dose, combination therapies or age less than five. The program was well received in the prescribing community. Limits and guidelines are available at palforkids.com.

Hard Edits: *Maine, Pennsylvania, Tennessee*

- Maine established “hard” edits associated with their PDL for specific quality parameters including dosage, duplicate therapies, and potentially adverse drug interactions. These edits take place at the point of sale, disallowing the filling of a prescription without prior authorization. In addition, trial of at least one preferred antipsychotic is required before allowing use of a non-preferred SGA.
- Pennsylvania established a hard edit for prescription of olanzapine, requiring prior authorization for non-grandfathered prescriptions. The program began in 2005 and resulted in a marked decrease in the use of olanzapine; however, there was significant shift to the use of another branded SGA, aripiprazole.

Preferred Drug Lists (PDLs): *California, Massachusetts, Maine, New Hampshire, Pennsylvania, Washington*

- These States all have a version of a PDL. It is likely that other States also have a list of drugs that are either preferred or for which access is restricted in some way. The degree to which these lists are accompanied by sets of rules that balance access, quality and costs is presently undetermined. Specific rules to set the PDL lists differ by States although several States use the common evidence based reviews. For more information the reader is encouraged to contact these States for more specific details regarding policies and practices for setting a PDL.

Clinic-Based Quality Improvement: *New York*

- New York uses an inpatient computerized, Web-based quality and utilization review program, the Psychiatric Services and Clinical Knowledge Enhancement System (PSYCKES) for the Medicaid population, from inpatient setting to outpatient clinics. This tool is presently in use both in New York City and throughout the State, and is used to identify poly-pharmacy and use of PAs with high/moderate risk of metabolic side-effects.

Electronic Information Exchange: *New Hampshire*

- New Hampshire developed e-prescribing as part of its pharmacy benefit management services. The program is jointly administered by NH Medicaid and its pharmacy benefit administrator, First Health Services, Inc.

Characterizing State Implementation Strategies: A Classification Matrix

New mental health programs are implemented frequently but comparisons between programs are problematic due to differing maturity, scope, and trends in treatment patterns unique to each State. A matrix (Table 2) was developed by a subcommittee of this project comprised of members from Washington, Massachusetts, Minnesota, Alabama, and California. They invited States to classify their practices as mature, promising, or emerging (State Practices attachment). The purpose was to identify practices that have worked well or are likely to, and highlight them in a standard manner. The matrix does not “rank” or “rate” performance but simply creates a set of standards for States to help in evaluating whether another State’s program can be implemented within resources and the current environment. The classification was designed to give a State the means to review each practice and consider its value based on the context of each State’s needs.

A “mature” practice was defined as one with methods and data showing measured and validated results implemented across multiple sites—often statewide. “Promising” practices have been implemented at one or a few sites and have some data showing results. “Emerging” practices have been implemented in at least one site with only preliminary data available. Not every practice described has all the properties listed within a single column. For example, a “mature” practice may be disseminated to only a few implementers, possibly because of cost or difficulty in implementation. Another practice that has been taken up by many sites may have very little information available about its efficacy and thus remain a “promising” practice. In each case, assignment will depend on the thoughtful judgment of the person or person making the classification assignment.

There are undoubtedly other features of practices that have not been addressed by this matrix. There is always a tension between completeness and usability of the tool. The publication committee believes the features selected can help to identify useful health care improvement activities for consideration.

Table 2. Implementation Strategies Classification Matrix

	Mature Practice			Promising Practice			Emerging Practice	Unclassified
Evidence	Peer Reviewed. Published studies or detailed reports with methods and outcomes data showing clearly showing desired results. More than one study or report. Independent review(s).			At least one implementation site with data showing desirable results.			Implementation in at least one site. Data may be preliminary.	None
Maturity	Varies, but usually three or more years.			Varies. Usually within one-three years.			Less than one year to two years. Could be longer.	Usually less than year or could be in planning phase. Could be longer.
Dissemination	Multiple implementations (possibly of varying maturity). Geography depends on the practice.			One or more implementations, at least one site with data.			At least one implementation.	May still be conceptual.
Cost Effectiveness*								
Cost	Net Saving	Wash		Net Saving	Wash		Uncertain	Unknown
Quality	Increase or same	Increase		Increase or same	Increase or same		Increase or same	Unknown
Access	Substantial shifts in access in the desired direction.			Shifts in access in the desired direction.			May show shifts in access in the desired direction; or does not shift untoward.	Unknown
Acceptance*								
By Provider	Good	Fair	Good	Fair	Fair	Poor	Undetermined	Unknown
By Member	Good	Good	Fair	Good	Fair	Poor	Undetermined	Unknown
Implementation	Straightforward. Minimal review. Minimal additional costs. Most resources already in place.			May be straightforward, or may require agency or legislative review. May require budgetary increases and/or additional resources.			Significant perceived barriers of cost, acceptance, review and/or resources.	Unknown, but barriers expected.

*Requires both elements.

SECTION 5

Change Management—Using the Resource Guide to Develop AP and MHD Quality Strategy

Introduction

Measurement is a critical component of quality improvement. There are numerous efforts to develop consensus on standardized measures for quality improvement in mental health care. The National Association of State Mental Health Program Directors Research Institute has implemented standardized measures across nearly all State psychiatric hospitals in the United States.^{31, 32} The Joint Commission recently developed a set of measures to assess the quality of inpatient psychiatric care in both the public and private sector.³³ The National Quality Forum is working to develop consensus on the best and most important measures across sectors and settings, reflecting a diversity of conditions, treatments, populations, and quality concerns.³⁴ Thus far, they have identified over a dozen measures for mental health.

There is however, a need for additional outpatient-based measures for children and adolescents. The *Report and Resource Guide* seeks to provide information that will contribute to a State's efforts to implement quality improvement initiatives aimed at these objectives. Various sections in this guide address distinct information needs and State users. Senior leaders are responsible for making the case for mental health quality improvement and taking action (Sections 1, 4, and 6) while program staff would need to provide the information necessary to develop and implement a quality improvement strategy (Sections 2, 3, and 5).

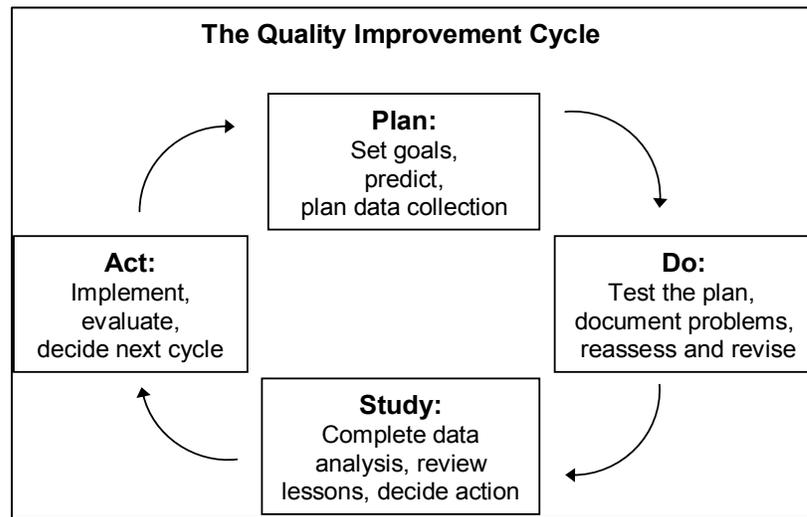
This Section discusses a model for quality improvement, presents a case study, discusses evaluation and offers a model for evaluation purposes. It also discusses how State leaders can begin to develop their own State-specific strategies to collect, analyze, and compare the data on AP use in children within their State.

Plan-Do-Study-Act (PDSA) Model

The PDSA is a time-tested quality improvement tool for guiding quality enhancement projects of all types (Figure 1). The PDSA model conceptualizes the continuing cycle of improvement. Its steps for effective quality improvement include:

- **Plan:** Set the goals of the quality improvement cycle—questions, predictions, data to be collected, and the who, what, when, and where of the project.
- **Do:** Carry out the plan and document problems and unexpected observations.
- **Study:** Complete the analysis of the data, compare to predictions, and summarize lessons.
- **Act:** Determine changes to be made and decide what will happen in the next cycle.³⁵

Figure 1.



Source: Adapted from Langley G, Nolan K, Nolan T, et al. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. San Francisco: Jossey-Bass Publishers, 1996.

The PDSA cycle usually applies at the point of production, in this case to the front-line of health care at the point of care. The concept also can be applied to the quality improvement role of State leaders. Drawing on insights from State quality improvement activities around the use of AP medications in children, State leaders might consider a “Partner-Plan-Do-Study-Act” model.

- **Partner:** Decide who are the strategic partners of quality improvement and recruit them to the project—champions in health care production, stakeholders (e.g., consumer/patient groups, health care professionals, purchasers, health plans, and topic experts), and key State leaders and agencies (e.g., visible champions, child mental health experts, program planning/evaluation staff, and quality improvement experts). Is the group large enough to include key leaders and perspectives, yet small enough to be productive?
 - For example, some States have local collaboratives for mental health quality improvement that address local issues while other States have a Statewide quality collaborative that include a variety of stakeholders along with key staff of relevant State agencies.
- **Plan:** The goals of a project will be broad in the context of statewide activities because many partners and processes will need to be involved. What does the group predict are the current obstacles to quality care? How will the goals be put into action? What data need to be collected to prove that the changes are indeed improvements?
 - For example, some States use the process to address a specific issue like AP use in clients under 5 years of age while others use it to assist in setting statewide polices, obtaining buy-in for guidelines, prior authorization criteria and policies for generic use.

- **Do:** Test the plan and document problems and unexpected observations as data are collected. Initial plans seldom produce desired results the first time. Pilot test the ideas of the group with front-line health care programs, providers, and consumers. Reconvene the partners and discuss successes and problems.
 - For example, see Section 6 and Epilogue for descriptions of how States have used the project data and are implementing utilization control.
- **Study:** Complete the data analysis, compare the results to predictions, and summarize lessons learned. Do the test results convince the partners that full-scale implementation will be successful? Because the scope of activities may be broad and costs may be involved, the planned action should be based on reasonable data and results.
 - For example, the State practices attachment and Section 4 are concise descriptions of the 36 practices being addressed in 16 States.
- **Act:** Determine the changes to be made. Implement the changes statewide or in a district. Continually assess those changes through data collection and analysis. Are the changes working? What will happen in the next cycle?
 - For example, the case study below is useful in understanding how one State acted on an issue and used the PDSA model to solve an issue with mental health drug prescribing.
 - The PDSA model can be applied to the context of State leadership in quality improvement. The actual approaches and actions that States take will be as varied as the examples that appear in Section 4 of this guide.
 - Additional tools include:
 - The Health Care and Workforce Improvement tools (<http://www.qaproject.org/resourcesintro.html>).
 - The Institute for Healthcare Improvement (IHI) breakthrough series focuses on change at the provider level, but is an important approach that State leaders should understand for developing change agents (<http://www.ihl.org/ihl>).

Case Study

Partner

Washington's State Department of Social and Health Services worked with the psychiatric community to improve prescribing practices of medications for ADHD in children and adolescents receiving FFS Medicaid services. Their process follows the PDSA model.

Plan

Beginning in 2004, Medicaid workers in Washington worked with community mental health and primary care providers to create consensus based safety thresholds for prescribing ADHD medications. These thresholds included age (less than 5 years old), combination use (use of two or more ADHD drugs for more than 30 days), and high doses of amphetamines or dexamethylphenidate (greater than 60 mg), methylphenidates or atomoxetine (greater than 120 mg), methylphenidate patch (greater than 30 mg), or Lisdexamfetamine [L-lysine-D-amphetamine]

(greater than 70 mg). The group approved thresholds and guidelines, which served as the basis for requiring second opinions whenever a child or adolescent was prescribed a drug which exceeded one of the thresholds.

Do

Beginning in May 2006, Washington Medicaid contracted with three children's medical centers and their pediatric and adolescent psychiatrists or developmental pediatricians to conduct second opinions via record reviews. A second opinion was required for combination use of ADHD medications for more than 30 days (except in instances of titration, tapering and crossover between medications). Refills of medications in excess of thresholds were allowed during record review; however, first-time prescriptions that exceeded thresholds were not filled while under review. If additional questions arose during the record review, the second-opinion provider often held a consultation with the prescriber via telephone.

Study

Washington Medicaid payment system contains patient-level information on use, demographics, and cost. Researchers were able to analyze this information both before (May 2004–April 2006) and after (May 2006–April 2008) the second-opinion process was put into place. Information on this process was collected from ADHD worksheets containing the prescribing rationale and second-opinion outcome (i.e., approval, denial, or alternative). The resulting analyses reflected that 5.35 percent of ADHD prescriptions exceeded thresholds, requiring 1,046 second-opinion reviews. Just over half (51.4 percent) of these resulted in a prescription adjustment. High doses of ADHD medications were reduced by 53 percent, in combinations by 44 percent and for patients less age 5 years and younger by 23 percent. The savings to Washington Medicaid as a result of the program was \$1.2 million.

Act

One key result of the ADHD second-opinion program was the extension by the Washington State legislature of this process to SGA medications prescribed to children and adolescents. Medicaid and a medical center are now required to measure prescription utilization as well as long-term outcomes such as symptom reduction, permanence of placement for children and adolescents in foster care, school performance, graduation rates, juvenile justice activity, and overall health benefits.³⁶

Developing a State Strategy

Implementation Teams

A few States are currently utilizing implementation teams to promote the use of evidence-based practices. Key team members could include individuals who know and/or have used the interventions or practices that need to be implemented, are skilled in implementation methods, and engage in continuous quality improvement. Team members also need to know how to apply usability testing and the PDSA cycle described above. In addition, the implementation team

would also include intermediaries—opinion leaders and change agents. Opinion leaders implement the new practice, which helps to overcome caution about risks and costs, and can help persuade others to take up the innovation. Change agents create demand for new practices, reduce barriers to adoption, and act as bridges between technical experts and potential users.

Getting Started

The six steps in the evaluation process may vary as to when they are carried out, though one step usually lays a foundation for the next. Steps will be repeated as results become clear and new issues arise. Each step serves to ensure the effectiveness of the evaluation.

- **Engaging stakeholders** is essential to ensure that the evaluation addresses the important elements of the program and that the evaluation is used. Several States have regular meetings with mental health leaders or use the Drug Utilization Review (DUR) committees as a sounding board to action.
- **Describing the program and goals** helps to detail strategies and provide opportunities for consensus building. Some States have charters and business plans that address AP use; others engage the community and legislature in setting safety standards and guidelines.
- **Focusing the evaluation design** addresses the greatest issues of concern. This step includes identifying the purpose of the evaluation; defining the users and usefulness of the evaluation; listing stakeholders' questions that need to be addressed; establishing methods to ascertain information upon which the evaluation will be based; and developing consensus around particular roles and responsibilities pertaining to the evaluation. Some States have started slowly to build trust and credibility. There are examples in Section 4 where evaluation and design have led to community agreements on prior authorization criteria and generics first programs for APs.
- **Gathering credible evidence** contributes to the robustness of the evaluation. Developing credible evidence involves defining appropriate indicators, identifying legitimate sources of information, ensuring the quality of data gathered, and aligning the infrastructure for collecting evidence with the environment (and individuals) from which the information is gathered. This is where the data dictionary allows a State to recreate the data described in Section 3. Using common data definitions, flags can be created, areas of concern can be noted, and then brought back to the committee. Some States have used this data in DUR presentations, targeting outlier counties for interventions and profiling prescribers.
- **Justifying conclusions** is important to ensure that the evaluation will be used. When consensus is reached regarding the goals and strategies of the program, when the values of the evaluation are aligned, and when the evidence gathered is credible, then conclusions will naturally be justified. At this point, conclusions and recommendations can be made using data. In addition, data can be used as an ongoing quality improvement program and contracting expectations. Some States have used the data and committees to assist in setting codes and informing legislators on statutory changes to improve quality and safety related to AP use.

- **Ensuring use and sharing lessons learned** includes designing mechanisms for feedback and dissemination of the information gained in the evaluation. For example, the data dictionary contains a process to measure and display county-to-county variations based on the flags.

Other Ideas for State Action

For some State leaders, broad statewide quality improvement efforts may seem unattainable or unrealistic, given the scope of their responsibilities or the status of their budgets. There are, however, other activities that help raise awareness of quality improvement and build support over time for larger quality improvement efforts. Some options include the following:

- Talk with other organizations and individuals about ways to improve care in your State (e.g., staff in the State health department, advocacy organizations, health care professional organizations for mental health, as well as providers and health plans).
- Convene a conference or advisory group of experts in the State to discuss strategies for quality improvement or work with one that already exists.
- Hold/participate in a legislative hearing or town hall meeting on health care quality in the State.
- Participate in State efforts to raise public awareness about the use of antipsychotic medications in children.
- Consider public-private partnerships and public-private collaboratives to address quality improvement.
- Examine ways for State employee health programs and Medicaid offices to work together to improve care.
- Help establish a program for Medicaid clients by partnering with private sector organizations for services.

SECTION 6

Lessons Learned—Moving Forward

Summary of Project Findings

The Antipsychotic Medication Use in Medicaid Children and Adolescents project was the first to assess and compare AP medication use in Medicaid children and adolescents across a large group of collaborating States. The project demonstrated that State Medicaid programs could agree on a set of core measures to flag potential issues in the safety of AP medication and MHD therapy, and could develop a framework for each State's analysis of its data on medication use. States shared a wide variety and number of approaches being developed to improve the quality of prescribing. Almost all the approaches showed some degree of effectiveness to change prescribing practices, improve quality or mental health outcomes. There was no single essential approach—each State crafted interventions based on its specific environment. Practices in this area are evolving and will continue to change and grow. The sharing of State data and practices allow for analysis of trends, turning data into information, prioritizing issues, learning from others and benchmarking to achieve a more reasonable assurance of success.

Implications for the Future

Standardizing Measures Across States

The paucity of nationally standardized data definitions and quality measure definitions applicable to the Medicaid population is an obstacle for Medicaid health care improvement. Pharmacy claims data were chosen for this initial set of exploratory analyses in part because there is greater standardization of data elements in pharmacy benefit programs and minimal claim lag. While a data dictionary provided definitions for a common set of indicators, variations in details of inclusion criteria, mix of eligibility categories, differences in diagnostic profiles and clinical characteristics, and other cross-State variations still existed. State data analyses were conducted separately by statistical programmers at the various sites, using separately developed programming code that varied across States. The project required the investment of a substantial amount of staff time at the State level for reruns of initial tables due to such issues as variations in claims systems, data element definitions, and the need to resolve apparent inconsistencies. Future projects would benefit from broader standardization and testing of data elements, measure definitions, and data collection instructions.

Achieving meaningful nationwide improvements in Medicaid will require both Federal and State commitment as well as an investment of time and effort to develop and use standardized measures and benchmarks.

Evaluating Clinical and Functional Outcomes in Claims Data and Beyond

This project focused on a relatively narrow core of descriptive measures related to utilization patterns and did not address the more complex issues of clinical outcomes such as medication side effects or patient functional status. These exploratory analyses do not provide a basis for determining optimal utilization rates that are consistent with optimizing patient outcomes. It was also not possible to determine the effect that interventions to reduce pharmacy utilization had on

utilization and costs in other health care service areas. Multiple methods will be required in future work to better improve understanding of changes in total health care service utilization and costs, as well as clinical outcomes. Ideally, future efforts would include cycles of measurement, intervention, and remeasurement.

Adopting Structured Approaches to Quality Improvement

Because this project was a snapshot of independent, State-specific practices, it proved difficult to understand the impact attributable to particular interventions. Most of the participating States used multiple interventions that overlapped. Adopting a more structured approach to quality improvement across States could accelerate the identification of interventions that have an impact on AP medication prescribing practices and health outcomes. Within States, adopting a standardized model for quality improvement with measurement of clinical outcomes, in addition to AP medication prescribing practices, would promote the identification of those interventions most effective in improving patient outcomes.

Sharing Lessons Learned

Bringing the Medicaid Medical Directors together on a focused project markedly increased their awareness of the varied number and breadth of innovative interventions targeted at the prescribing practices of AP medications for children and adolescents. Project participants benefited greatly from the work effort by developing an in-depth understanding of new practice options and differing potential measures of outcomes. The project highlighted the need to establish ongoing mechanisms for sharing new learning in this rapidly growing field.

Benchmarking

Although project participants remarked on the potential benefits of benchmarking, most agreed that further work is needed to translate these measures into metrics suitable for provider feedback and dissemination of State comparative information. Engaging stakeholders in the design and implementation of future improvement initiatives should increase acceptance of the validity and meaningfulness of results. In addition, State leaders may want to work incrementally toward transparent and comparative benchmarking by developing community-wide agreement on how such data are to be used.

Pay for Performance

Contractual arrangements play a variety of roles in the provision of clinical services and pharmacy benefits in Medicaid programs. When contracting for pharmacy benefits and overseeing managed care providers, State Medicaid programs could explicitly require effective practice improvement interventions and attach fiscal benefits and penalties to their performance. Using the data and flags outlined in this project, a State can dialogue with providers and contractors concerning measures and goals that could fit into a contract or pay-for-performance program.

Investing in Databases

Health care system administrators, including State Medicaid leaders, are responsible for seeing that the populations they serve receive adequate services within the usual standard of care while improving both quality and costs, which add to the value of mental health care. Health care system administration is, at its best, a population-based form of evidence-based medicine. Evidence-based medicine is defined as “the integration of the best research evidence with clinical expertise and patient values.”³⁷ State leaders can optimize their decisionmaking by investing in and developing quality and outcome information from their claims systems to complement and enhance clinical research evidence and expert consensus.

Project participants found great value in learning about State’s actual service utilization and practices, and felt it greatly complemented the repertoire of evidence-based interventions developed in more idealized research settings (see State Practices attachment on actions in response to participation in this collaborative initiative). As noted in the Epilogue, to capture the impact and consequences of State participation in this project, all States were contacted by phone between September and October of 2009. Brief interviews were conducted with State point persons and notes were taken during these meetings. Quotes were summarized and reviewed by States to check for accuracy and States were provided an opportunity to update this information in March and April of 2010. For many States participation in the MMDLN project furthered initiatives related to psychotropic prescribing practices for children that were already underway. For other States, participation was the first step toward addressing this quality concern. Examples of the utility of participation (Epilogue) included helping to identify quality indicators to incorporate into existing programs such as prior approval programs, quality improvement collaboratives, drug utilization review procedures, and consultation programs; identifying treatment disparities for populations of special concern such as foster care children; identifying quality issues of special concern for the State; communicating concerns with stakeholders; lending credibility to quality improvement initiatives already underway; and supporting the development of new policy and legislation.

Conclusion

This project provided an opportunity for States to come together to discuss their experience with policies and practices related to the challenging issue of prescribing AP medication to children and adolescents, and a framework for identifying issues in their AP utilization trends. It also helped participating States to make more effective use of their own data to monitor and address issues of AP medication prescribing by providing a collaboratively agreed upon set of core measures and a standardized approach to data collection and analysis. Most important, this project demonstrated the value of working collaboratively to more broadly measure and monitor treatment practices for children and adolescents who suffer from a psychiatric disorder. Ultimately, the objective of this project is to foster more collaboration and information sharing among States to identify and develop best practices that provide America’s children and adolescents with the right care at the right time for the right reasons.

EPILOGUE

State Actions Taken as a Result of Participation in the Antipsychotic Medication Use in Medicaid Children and Adolescents

Outcomes of Participation

To capture the impact and outcomes of State participation in this project, all States were contacted by phone between September and October of 2009. Brief interviews were conducted with State point persons, and notes were taken during these meetings. Quotes were summarized and reviewed by States to check for accuracy (Table 1). Examples of the utility of participation included:

- Lending credibility to efforts already underway;
- Bringing special attention to health disparities, such as those involving children in foster care, or regional variation;
- Identifying quality indicators to incorporate into existing programs such as State DURs, PA programs, quality improvement collaboratives, clinical decision-making supports, and consultation programs;
- Defining quality indicators, for example in high dose parameters where therapeutic doses have generally not been defined;
- Offering examples of State programs for improving quality of care;
- Use of multi-State comparison data, based on a standard set of definitions, that help to identify quality concerns for a State and may assist in implementing new initiatives;
- Use of multi-State comparison data to increase awareness of quality concerns and practice trends (e.g., rising use of AP for children) among stakeholders, policymakers, and community providers; and
- Supporting development of new policy and legislation.

Table 1. Outcomes of Participation Table

AL	<ul style="list-style-type: none"> ▪ This project was aligned with efforts already underway in Alabama to address antipsychotic use in children. Participation in the project lent further credibility and support to these efforts and provided an opportunity to collaborate with other States.
	<ul style="list-style-type: none"> ▪ A task force has been established to review AP use (although underway when the project began, the project reinforced the need).
	<ul style="list-style-type: none"> ▪ Two primary interventions have been developed: (1) focused mailing to prescribers who have clients less than 18 years of age on an antipsychotic; (2) peer-to-peer phone calls conducted by a child psychiatrist with any physician with a client less than 5 years old on any AP to discuss the use of these drugs in children.
CA	<ul style="list-style-type: none"> ▪ The project provided an approach to examine dosing of antipsychotics in children, where therapeutic doses had generally not been defined. These quality indicators may be adopted by the Department of Health Care Services (DHCS) to reduce variation.
	<ul style="list-style-type: none"> ▪ The project enhanced the activities of CalMEND (California Mental Health Care Management), a collaborative quality improvement initiative between DHCS and Mental Health to improve antipsychotic prescribing practices for adults and children.
	<ul style="list-style-type: none"> ▪ Beginning in 2007, CalMEND carried out a Performance Improvement Project (PIP). This multi-county collaboration led to the development of a set of quality measures for antipsychotic use in adults and a “pharmacy toolkit.” As part of PIP, optimum ranges for dose, medication adherence (gaps between prescriptions), access to medication, and poly-pharmacy indicators were developed for use in treatment of adults with seriously mentally ill (SMI).
	<ul style="list-style-type: none"> ▪ Based on this work, the antipsychotic utilization review/management quarterly report of the California Department of Health Care Services Pharmacy Benefits Division includes the measures for adults with SMI. In addition to adult measures, the demographic analyses include children and adolescents (age, ethnicity, geographic location by counties). ▪ In their next quarterly report, California’s Pharmacy Benefits Division plans to highlight the children and adolescent population using the AP measures. It is hoped that use of these measures will begin the process of vetting and adopting the AP measures by DHCS.
CO	<ul style="list-style-type: none"> ▪ The initiation of this project coincided with Colorado’s desire to examining antipsychotic use in children. Participation in this project provided a set of indicators to examine and examples of State programs for improving quality of care.
	<ul style="list-style-type: none"> ▪ Since the project began, Colorado has introduced a PDL for stimulants, antidepressants and atypical antipsychotics.

IN	<ul style="list-style-type: none"> As the first multi-State comparison of AP use in children, the project provided the basis for comparison to other States, their policies, and practices.
	<ul style="list-style-type: none"> Project data will be shared with the Mental Health Quality Advisory Committee (MHQAC) as they begin discussion of mental health drug use in children.
	<ul style="list-style-type: none"> The MHQAC was created during the 2005 session of the Indiana General Assembly to develop guidelines and programs to allow open and appropriate access to mental health medications, provide educational materials to prescribers, and to promote appropriate use of mental health medications. This project will align with the MHQAC objectives for 2010.
MA	<ul style="list-style-type: none"> Massachusetts has two Medicaid/Department of Mental Health workgroups devoted to psychopharmacology; both workgroups have been influenced by work of MMDLN and this project.
	<ul style="list-style-type: none"> The first workgroup, concerned with all ages, has developed an emerging program of PA for certain psychotropic drugs, supported by educational letters to prescribers, and informed by the efforts of the MMDLN project.
	<ul style="list-style-type: none"> The second workgroup focuses on Medicaid members under the age of 19, and has followed the work of the MMDLN closely. This committee works with both managed care organizations (MCOs) and non-MCO members for data collection to support decisionmaking. While MCO and non-MCO data may vary, the committee has sought to have its data collections as close to the MMDLN as possible. This effort is in direct response to the MMDLN effort.
ME	<ul style="list-style-type: none"> Maine relies heavily on academic research and national surveys as sources of validation in its work to develop consensus for policy implementation (example, Dartmouth Atlas, health disparities research) and found participation in the project helpful for a peer-level comparison.
	<ul style="list-style-type: none"> The project provided the opportunity to view Maine’s performance and policies in comparison with other States, making participation “tremendously useful.”
	<ul style="list-style-type: none"> The project informed quality improvement and reinforced the need for data collection, review, and reporting in an ongoing fashion for the child and adolescent population.
	<ul style="list-style-type: none"> Maine has used the project and its key questions as a template to review State policies.

MO	<ul style="list-style-type: none"> ▪ The study was helpful to focus Missouri’s efforts in understanding AP use in kids.
	<ul style="list-style-type: none"> ▪ Prior to the project initiation, Missouri had been focusing on high dose and poly-pharmacy but had overlooked the rapidly increasing use of AP in the youth population. Missouri has refocused its interventions to include general AP use in kids.
	<ul style="list-style-type: none"> ▪ As a result of data, policy, and practice review related to AP in kids, Missouri has identified an opportunity to start a dialogue with P&T and DUR. The resulting information will be presented to the General Assembly to begin a legislative dialogue around the topic.
	<ul style="list-style-type: none"> ▪ As a result of this study, Missouri conducted a study on foster children (wards of State) and medication use in the cohort.
	<ul style="list-style-type: none"> ▪ The project was helpful in understanding the practices among participating States to confirm current best practices and activities.
	<ul style="list-style-type: none"> ▪ Missouri viewed the project as a collection of best practices related to psychotropic medication use in children.
NH	<ul style="list-style-type: none"> ▪ New Hampshire has used the project as a launching point for work on AP use in children.
	<ul style="list-style-type: none"> ▪ Based on the project, New Hampshire has taken action and brought new initiatives to work groups focused on AP use in kids.
	<ul style="list-style-type: none"> ▪ Based on work with the project, New Hampshire has identified indicators to flag for children on AP, reviewed measurement indicators, identified additional measurement strategies, reviewed peer controls, and is considering the use of second opinions and step therapy.
NY	<ul style="list-style-type: none"> ▪ Project participation has increased awareness of prescribing for children in foster care and prompted a series of meetings among the Department of Health (DOH), the Office of Mental Health (OMH), and the Office of Children and Family Services (OCFS), and some exploratory data analysis.
	<ul style="list-style-type: none"> ▪ The Psychiatric Services and Clinical Knowledge Enhancement System (PSYCKES), a Web-based platform to support quality improvement efforts in Medicaid, will incorporate the project indicators. The auspices of the AHRQ–MMDLN project helped to promote acceptance of the quality indicators, for example in selecting and defining dose parameters.
OR	<ul style="list-style-type: none"> ▪ The project provided both new and renewed interest in AP use in kids including legislative action, PDL development, and DUR changes.
	<ul style="list-style-type: none"> ▪ As a result of participation in this project, and in alignment with efforts already underway in Oregon, a review of psychotropic medication use in foster children resulted in passage of new 2009 State legislation. This statute mandates annual review of medications for foster children taking more than two psychotropic medications and

	requires a mental health assessment prior to issuance of any antipsychotic medication.
OK	<ul style="list-style-type: none"> As a result of participation in this project, Oklahoma has developed a director-level workgroup between the Department of Mental Health and the Medicaid agency.
	<ul style="list-style-type: none"> Oklahoma was concerned with its prescribing practices and health status ranking, as previously they had exhibited poor performance on select health indices as compared to other States. The project provided an opportunity to evolve policies and gain awareness into the work of other States.
	<ul style="list-style-type: none"> Oklahoma would like to continue its involvement in multi-State work groups for peer comparison and best practice review.
PA	<ul style="list-style-type: none"> Pennsylvania found participation in the project very useful.
	<ul style="list-style-type: none"> The data requests allowed for directional data analysis. Pennsylvania then followed with “deep dives” into the data for further review of AP use and populations served. As a direct result of the data pull for this project, Pennsylvania looked further into foster care and use of AP. From data review, Pennsylvania confirmed concerns surrounding (1) short-term use of AP in foster care, (2) low dose of AP for non-diagnosis specific treatment (no mental health diagnosis to support use), (3) observation of non-guideline based use for AP for difficult behavior disorders and substance abuse treatment (withdrawal), and (4) episodic use for conduct disorders and sedation for ADHD at night (quetiapine). Pennsylvania conducted a cohort review for a two-year period to confirm hypothesis Based on this review, Pennsylvania found a significant number of children were prescribed antipsychotics for episodic non-guideline based use (generally used as sedation agents).
	<ul style="list-style-type: none"> The project reinforced Pennsylvania’s implementation of required PA of all requests to use APs in children under 6 years of age.
TN	<ul style="list-style-type: none"> At time of project initiation, Tennessee had a parallel interest in reviewing use of psychotropic medication in children. Prior to project initiation, Tennessee had instituted controls on psychotropic use in children.
	<ul style="list-style-type: none"> Historically, Tennessee has a high drug utilization rate. Based on this, Tennessee was interested in learning more about other State’s prescribing rates and populations.
	<ul style="list-style-type: none"> While there were no “ah ha” moments, the project outcomes helped to validate the work through multi-State comparisons. The project served as a litmus test to determine if limits have worked as intended.

WA	<ul style="list-style-type: none"> At time of project initiation, Washington had set up two mental health work groups to address the use of psychotropic and mental health medication in children and adults. Prior to project initiation, Washington had instituted controls on ADHD, mood stabilizers, and antidepressant use in children with some published success in the use of second opinions for ADHD drugs (too young, too many, too much).
	<ul style="list-style-type: none"> Historically, Washington has a low drug utilization rate; however, based on comparisons with other States, medication gap rates are high. Washington is interested in learning more about other State's prescribing rates and how to improve adherence. WA plans to reach out to States that performed well on this measure to explore incorporating their programs.
	<ul style="list-style-type: none"> While Washington's total rates were good in comparison (except for gap in prescriptions), the project outcomes helped to validate the work and prioritize activities. In addition, the project has help to galvanize the State into several new statutes (HB1088, HB5892, HB5773) as well as several new programs such as a "generics first" program for new AP starts.

References

- Shaffer D, Fisher P, Dulcan MK, et al. The NIMH Diagnostic Interview Schedule for Children Version 2.3 (DISC-2.3): Description, acceptability, prevalence rates, and performance in the MECA Study. *J Am Acad Child Adolesc Psychiatry* Jul 1996;35(7):865-877; U.S. Department of Health and Human Services. Mental Health: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, 1999. <http://mentalhealth.samhsa.gov/features/surgeongeneralreport/home.asp>.
- Thomas CR, Holzer CE, 3rd. The continuing shortage of child and adolescent psychiatrists. *J Am Acad Child Adolesc Psychiatry*. Sep 2006;45(9):1023-1031.
- Crystal S, Olfson M, Huang C, et al. Broadened use of atypical antipsychotics: safety, effectiveness, and policy challenges. *Health Aff (Millwood)*. Sep-Oct 2009;28(5):w770-781.
- Burns BJ, Costello EJ, Angold A, et al. Children's mental health service use across service sectors. *Health Aff (Millwood)*. Fall 1995;14(3):147-159.
- Parens E, Johnston J. Controversies concerning the diagnosis and treatment of bipolar disorder in children. *Child Adolesc Psychiatry Ment Health*. 2010;4:9.
- American Psychiatric Association. Available at: <http://www.dsm5.org/Pages/Default.aspx>. Accessed June 4, 2010.
- Zito JM, Safer DJ, DosReis S, et al. Rising prevalence of antidepressants among US youths. *Pediatrics*. May 2002;109(5):721-727.
- DosReis S, Zito JM, Safer DJ, et al. Multiple psychotropic medication use for youths: a two-state comparison. *J Child Adolesc Psychopharmacol*. Feb 2005;15(1):68-77.
- David-Ferdon C, Kaslow NJ. Evidence-based psychosocial treatments for child and adolescent depression. *J Clin Child Adolesc Psychol*. Jan 2008;37(1):62-104.

10. Eyberg SM, Nelson MM, Boggs SR. Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *J Clin Child Adolesc Psychol*. Jan 2008;37(1):215-237.
11. Fossum S, Handegard BH, Martinussen M, et al. Psychosocial interventions for disruptive and aggressive behaviour in children and adolescents: a meta-analysis. *Eur Child Adolesc Psychiatry*. Oct 2008;17(7):438-451.
12. March J, Silva S, Vitiello B. The treatment for adolescents with depression study (TADS): methods and message at 12 weeks. *J Am Acad Child Adolesc Psychiatry*. Dec 2006;45(12):1393-1403.
13. Miklowitz DJ, Axelson DA, Birmaher B, et al. Family-focused treatment for adolescents with bipolar disorder: results of a 2-year randomized trial. *Arch Gen Psychiatry*. Sep 2008;65(9):1053-1061.
14. MTA Cooperative Group. National Institute of Mental Health Multimodal Treatment Study of ADHD follow-up: 24-month outcomes of treatment strategies for attention-deficit/hyperactivity disorder. *Pediatrics*. 2004;113:754-761.
15. O'Kearney RT, Anstey KJ, von Sanden C. Behavioural and cognitive behavioural therapy for obsessive compulsive disorder in children and adolescents. *Cochrane Database Syst Rev*. 2006(4):CD004856.
16. Young S, Amarasinghe JM. Practitioner review: non-pharmacological treatments for ADHD: a lifespan approach. *J Child Psychol Psychiatry*. Feb 2010;51(2):116-133.
17. Coyle JT. Psychotropic drug use in very young children. *JAMA*. Feb 23 2000;283(8):1059-1060.
18. Correll CU. Antipsychotic use in children and adolescents: minimizing adverse effects to maximize outcomes. *J Am Acad Child Adolesc Psychiatry*. Jan 2008;47(1):9-20.
19. Vitiello B. Ethical considerations in psychopharmacological research involving children and adolescents. *Psychopharmacology (Berl)*. Dec 2003;171(1):86-91.
20. Whittington CJ, Kendall T, Fonagy P, et al. Selective serotonin reuptake inhibitors in childhood depression: systematic review of published versus unpublished data. *Lancet*. Apr 24 2004;363(9418):1341-1345.
21. Zito JM, Derivan AT, Kratochvil CJ, et al. Off-label psychopharmacologic prescribing for children: history supports close clinical monitoring. *Child Adolesc Psychiatry Ment Health*. 2008;2(1):24.
22. Weisz JR, Doss AJ, Hawley KM. Youth psychotherapy outcome research: a review and critique of the evidence base. *Annu Rev Psychol*. 2005;56:337-363.
23. Jensen PS, Buitelaar J, Pandina GJ, et al. Management of psychiatric disorders in children and adolescents with atypical antipsychotics: a systematic review of published clinical trials. *Eur Child Adolesc Psychiatry*. Mar 2007;16(2):104-120.
24. Safer DJ, Zito JM, DosReis S. Concomitant psychotropic medication for youths. *Am J Psychiatry*. Mar 2003;160(3):438-449.
25. Domino ME, Swartz MS. Who are the new users of antipsychotic medications? *Psychiatr Serv*. May 2008;59(5):507-514.
26. Cohen JA, Mannarino AP, Perel JM, et al. A pilot randomized controlled trial of combined trauma-focused CBT and sertraline for childhood PTSD symptoms. *J Am Acad Child Adolesc Psychiatry*. Jul 2007;46(7):811-819.
27. March JS, Silva S, Petrycki S, et al. The Treatment for Adolescents With Depression Study (TADS): long-term effectiveness and safety outcomes. *Arch Gen Psychiatry*. Oct 2007;64(10):1132-1143.

28. Silverman WK, Pina AA, Viswesvaran C. Evidence-based psychosocial treatments for phobic and anxiety disorders in children and adolescents. *J Clin Child Adolesc Psychol*. Jan 2008;37(1):105-130.
29. Kaiser Family Foundation. State health facts, distribution of Medicaid spending by services. 2001. Available at: <http://www.Statehealthfacts.kff.org>. Accessed June 4, 2010.
30. Texas Department of State Health Services. Psychotropic Medication Utilization Parameters for Foster Children. In: Texas Department of State Health Services, ed. Vol Version – 050207cb2007.
31. National Association of State Mental Health Program Directors Research Institute Inc (NRI). National public rates—age stratification report; behavioral healthcare performance measurement system: restraint hours, 2010. Available at: http://www.nri-inc.org/reports_pubs/2010/Public_Age_Stratification_Rates.pdf. Accessed June 10, 2010.
32. National Association of State Mental Health Program Directors Research Institute Inc (NRI). National public rates—understanding aggregate rate reports; behavioral healthcare performance measurement system, 2010; http://www.nri-inc.org/reports_pubs/2010/National_Public_Rates.pdf; Accessed June 10, 2010.
33. Joint Commission. Hospital based inpatient psychiatric services (HBIPS) core measure set. 2010; <http://www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/Hospital+Based+Inpatient+Psychiatric+Services.htm>. Accessed June 10, 2010.
34. The National Quality Forum. National voluntary consensus standards for hospital psychiatric care, 2010. Available at: http://www.qualityforum.org/Projects/Hospital_Psychiatric_Care.aspx. Accessed June 10, 2010.
35. Langlely GJ. *The improvement guide: a practical approach to enhancing organizational performance*. 1st ed. San Francisco: Jossey-Bass Publishers; 1996.
36. Thompson JN, Varley CK, McClellan J, et al. Second opinions improve ADHD prescribing in a Medicaid-insured community population. *J Am Acad Child Adolesc Psychiatry*. Jul 2009;48(7):740-748.
37. Sackett DL, Straus SE, Richardson WS, et al. *Evidence-based medicine: how to practice and teach EBM*. 2nd ed. Edinburgh; New York: Elsevier/Churchill Livingstone; 2000.