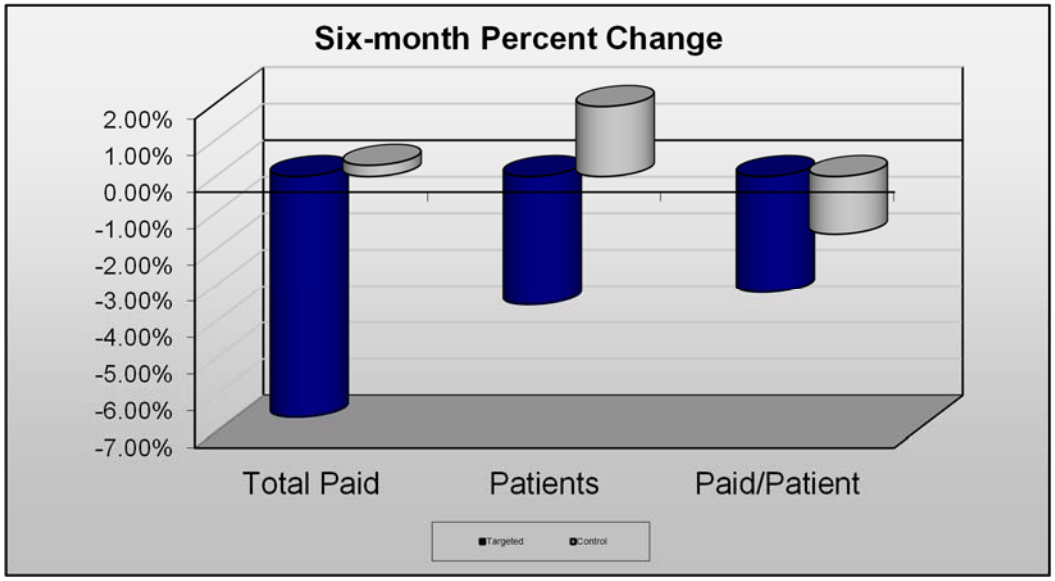
Management of Psychotropic Drugs in Pediatrics
Prepared for Texas Medicaid in January 2022

EXECUTIVE SUMMARY

Purpose of Intervention	The goal of this quality management program is to assist physicians in the evaluation of psychotropic drug therapy in youth to maximize therapeutic benefits while minimizing risks and adverse outcomes, avoiding unnecessary concomitant therapy, and providing cost-avoidance opportunities.

Intervention	Intervention Type	Population-based mailing
	Intervention Mailing Date	March 18, 2021
	Pre-intervention Period (Baseline)	Oct 01, 2020 – March 31, 2021
	Post-intervention Period (Post)	May 01, 2021 – Oct 31, 2021
	Number of Letters Mailed	154
	Number of Targeted Physicians	154



Savings Calculations

State Cost Savings Calculation:	
Targeted Group: Actual Psychotropic Drugs Average Cost Per Patient Per Month (Pre)	$196.38
% Change in Control Group from Pre to Post	-1.58%
Estimated Psychotropic Drugs Paid Amount Per Targeted Patient Per Month if No Intervention	$193.29
Targeted Group: Psychotropic Drugs Cost Per Patient Per Month (Post)	$190.13
Estimated Cost Savings Per Patient Per Month	$3.16
Total Monthly Number of Targeted Panel Patients Served in Post Period	113,886
6-Month Total Savings	$359,879.76
6-Month State General Revenue Funds Savings	$143,987.89
12-Month Total State Savings	$287,975.78

BACKGROUND

Use of antipsychotics at doses above recommended maximums are associated with adverse outcomes and associated costs. Individuals who receive multiple psychotropic medications are at an increased risk of drug-drug or drug-disease interactions, duplicate or unnecessary therapy, non-adherence, and hospitalizations. Moreover, the use of multiple antipsychotics has not been shown to improve efficacy or outcomes. The management of metabolic side effects of second-generation antipsychotics (SGAs) in children and adolescents should include regular monitoring of BMI, blood pressure, blood glucose or hemoglobin A1c and lipid profiles. Additionally, the SUPPORT Act now requires that states implement programs to monitor and manage the appropriate use of antipsychotics in children in the Medicaid program. [1-7]

Indicator #1: High Dose: Oral Antipsychotics

Doses of antipsychotics above the recommended maximum daily dosage may place patients at increased risk of adverse effects, especially EPS.[1-6,8-9]

Candidates (denominator):	All patients < 18 years of age receiving antipsychotic therapy in the past 60 days.
Exception Criteria (numerator):	Candidates who received an oral antipsychotic at a dose above the recommended daily dose as established by the Texas Health and Human Services Commission in the past 30 days (Table 1 and Table 2).

Indicator #2: Multiple (3 or more) Oral Antipsychotics

Adequate research to support the efficacy of concurrent use of more than one antipsychotic agent has not been published. More complicated regimens may be associated with decreased adherence, increased adverse effects, and increased costs.[1-9]

Candidates (denominator):	All patients < 18 years of age receiving oral antipsychotic therapy in the past 60 days.
Exception Criteria (numerator):	Candidates who received three or more oral antipsychotics for more than 35 of 60 days.

Indicator #3: Polypharmacy ≥4 Psychotropic Drugs Concurrently

To increase prescriber awareness of patients on polypharmacy regimens and to encourage review of the identified therapy. This may result in discontinuation of drug therapy that is no longer necessary. [1-6]

Candidates	All patients < 18 years of age receiving psychotropic medications.

(denominator):

Exception Criteria (numerator): Candidates with >/= 4 psychotropic agents (e.g., antidepressants, antipsychotics, anxiolytics, sedatives, hypnotics, anticonvulsants, antimanics, stimulants, clonidine, and guanfacine) for two consecutive 30 days periods in the last 60 days. Anticonvulsants in patients with a history of epilepsy are excluded. Additionally, this indicator does not include diazepam claims for patients with multiple sclerosis, muscular dystrophies, or cerebral palsy. Claims for anti-anxiety/sedatives are not included where the days' supply is 1 or less and the quantity is 4 or less. This prevents these claims, meant for acute use, that are likely procedural related, from being included.

Indicator #4: Monitoring of Second-Generation Antipsychotics (SGAs): Glucose or Hemoglobin A1c

Use of SGAs is associated with potential metabolic adverse effects. When used for extended periods of time patients should be monitored for changes in their blood glucose/hemoglobin A1c and lipid panel.[7,8] Routine chemistries/laboratory monitoring that includes hemoglobin A1c, blood glucose, and lipid panel should be assessed. [1-6]

Candidates (denominator): All patients < 18 years of age receiving an SGA therapy for >/= 45 days in the past 90 days.

Exception Criteria (numerator): Candidates with therapy in the past 30 days for an SGA who do not have a documented blood glucose and/or hemoglobin A1c in the past year.

Indicator #5: Monitoring of SGAs: Lipids

Use of second-generation antipsychotics is associated with potential metabolic adverse effects. When used for extended periods of time patients should be monitored for changes in their blood glucose/hemoglobin A1c and lipid panel.[7,8] Routine chemistries/laboratory monitoring that includes hemoglobin A1c, blood glucose, and lipid panel should be assessed. [1-6]

Candidates (denominator): All patients < 18 years of age receiving SGA therapy for >/= 45 days in the past 90 days.

Exception Criteria (numerator): Candidates with therapy in the past 30 days for an SGA who do not have a documented lipid panel in the past 2 years.

METHODOLOGY

Changes in intervention-related pharmacy dollars paid, pharmacy dollars paid per patient per month (PPPM), and number of pharmacy claims were examined. This intervention identified providers whose patients were affected by duplicate therapy, and increased risk of ADE. To assess the impact of the intervention, pharmacy drug claims were reviewed from October 2020 through October 2021.

Clinical Criteria: Criteria, rationale, and text message(s) to providers are listed below. All physicians with at least two recipients "hitting" on criteria received letters. The criteria and prescriber message for each clinical indicator are provided below.

Operational definitions:

Targeted Group – physicians treating at least three patients with clinical issues and who received mailed intervention materials *(Section 1.e.1.A Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal).*

Control Group - physicians treating three or fewer patients but did not receive mailed intervention materials *(Section 1.e.1.A Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal).*

Intervention Related Drugs: Psychotropic Therapy Agents

Pre Intervention Time Period – Oct 01, 2020 – March 31, 2021

Post Intervention Time Period – May 01, 2021 through October 31, 2021

6-month Total Paid – total drug costs can be defined as the total amount of paid drug claims for the above time periods for the prescribers in the control and target groups. The target group consisted of those prescribers who had prescribed multiple drug therapy to one or more patients and received mailing materials. The control group consisted of all other prescribers who prescribed multiple drug therapy to a patient in the designated time periods *(Sections 1.e.1. and 1.e.2 Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal).*

Total Paid 6-month pre and post – total drug costs can be defined as the total amount of paid intervention-related drug claims for the above time periods for the prescribers in the control and target groups. The target group consisted of those prescribers who had prescribed intervention-related drug therapy to more than three Medicaid patients. The control group consisted of all other prescribers who prescribed intervention-related drug therapy agents in the designated time periods *(Sections 1.e.1. and 1.e.2 Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal).*

Average Number of Panel Patients per Month - during the 6-month pre and post time periods, the number of unique Medicaid patients with a drug claim submitted using a respective provider number was captured each month. Medicaid patients that did not have a drug claim were not counted in the prescriber's panel. The monthly numbers were summed then divided by six to calculate the monthly average. For example, in Table 3, the physician (with provider number AB123456) had an average of 12 patients with at least one drug claim per month. If a patient had two different claims in June, they would be counted as one patient. By evaluating all patients seen by a specific physician, changes in prescribing patterns can be evaluated on existing and new patients *(Sections 1.e.1. and 1.e.2 Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal).*

Table 3: Average Number of Panel Patients per Month

Provider Number	Month #	Number of Unique Patients with a Drug Claim
AB123456	1	10
	2	10
	3	10
	4	12
	5	13
	6	17
Total		72
Average Number of Panel Patients per Month		12

Average Cost/Patient per Month – this was calculated by dividing the total dollars paid for drug claims during the analysis time period by the total number of Medicaid panel patients during the respective time period. For example, in the targeted group post analysis; there were 187,993 patients who had a drug claim during the six-month review period. The total amount of dollars paid for drug claims for these patients during the post analysis was $38,754,004. Dividing these two numbers ($38,754,004/187,993) yields an average cost per patient of $206.15 *(Sections 1.e.1. and 1.e.2 Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal).*

$$\text{Average Cost/Patient/per Month} = \frac{\text{Total Amount Paid for Intervention Drugs}}{\text{Average number of Panel Patients per Month}} / \text{(\# Months)}$$

Total State Savings *(Sections 1.e.3 and 1.e.4 Exhibit A of the Agreed Modifications to the RFP and Contractor Proposal)*:

- Intervention Average Cost Savings per Month - the percent change seen in the control group was applied to the intervention group baseline Average Cost per Patient per Month. This amount represents the estimated Amount Paid per Targeted Physician per Patient in the absence of the intervention (i.e., Estimated Paid Amount). The Estimated Paid Amount per Patient per Month was then subtracted from the actual Intervention Target Group Average Cost per Patient per Month to estimate the Average Cost Savings per Patient per Month.
- 6-Month Total Savings - the Intervention Average Cost Savings per Patient per Month was multiplied by the total number of targeted patients served over the 6-month time frame.
- 6-Month State General Revenue Funds Savings= 6-Month Total State Savings X 0.4001.
- Total State Savings = 6-Month State General Revenue Funds Savings X 2.

RESULTS

Population-based intervention

A total of 154 physicians were targeted and received intervention materials. Table 4 compares the 6-month total amount paid for psychotropic drugs, the total number of patients in each physician's panel per month, and the average cost per patient for the targeted and control groups

during the six-month pre and post periods. When comparing the pre-Average Cost per Patient per Month between the targeted and control groups, the cost was approximately $2 higher for the targeted group. This difference may be due to such factors as the targeted group having more patients prescribed intervention-related drugs per physician or that associated average intervention-related drug costs are inherently higher in the targeted group.

The target group saw an 6.60% decrease in the amount paid for intervention-related drugs while the control group saw a 0.31% increase. Additionally, the average number of monthly patients for the physician's panel decreased 3.52% for the targeted group and increased 1.91% for the control group. To control for changes in case load variance (i.e., the change in the number of panel patients) between the two groups, the average cost per patient was also calculated. Total amount paid and number of panel patient trends led to a 3.19% decrease in average cost per patient per month in the targeted group and a 1.59% decrease for the control group.

Table 4: Six-Month Trends for Overall Targeted vs Control Group

Group	Psychotropic Drugs -- Six Months Total Paid Pre/Post			Average Number of Panel Patients per Month			Psychotropic Drugs - Average Cost per Patient per Month		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
Targeted	$23,182,438	$21,653,121	-6.60%	19,674	18,981	-3.52%	$196.38	$190.13	-3.19%
Control	$223,342,706	$224,026,711	0.31%	190,862	194,516	1.91%	$195.03	$191.95	-1.58%

FINANCIAL IMPACT - BUSINESS ANALYSIS

Table 5 shows the Intervention Average Cost Savings per Patient per Month and the savings calculations. Had the intervention not been mailed, the targeted pre average cost per patient per month would have decreased 1.58% from $196.38 to $193.29. The net difference between the actual and estimated average cost/patient for the targeted group was a decrease of $3.16. Based on 113,886 targeted patients served per month during the six-month post period, the six-month Total Savings and Total State Savings are decreased expenses of $359,879.76 and $143,987.89, respectively. Over a twelve-month period, the Total State Savings is decreased expenses of $287.975.78.

Table 5: Overall Intervention Average Cost Savings

State Cost Savings Calculation:	
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Table 6 shows the Change in clinical indicators for the intervention. Overall the clinical indicators decreased by 27.5% from 247 to 179.

Table 6: Changes in Clinical Indicators

Clinical Indicators	Baseline	Oct-2021	% Change
High Dose: Oral Second Generation Antipsychotics (SGA)	3	2	-33.3%
Polypharmacy (4 or more Psychotropic Medications)	29	21	-27.6%
Monitoring of SGAs: Glucose or Hemoglobin A1c	120	85	-29.2%
Monitoring of SGAs: Lipid Panel	95	71	-25.3%
Total	247	179	-27.5%

CONCLUSIONS

This population-based intervention was successful in encouraging appropriate use of psychotropic medications and providing prescribers with educational tools to better communicate with their patients' issues regarding appropriate treatment. This resulted in an economic impact on Texas Medicaid's pharmacy program expenditures, with a calculated twelve-month overall decrease in costs of $719,759.52 and decreased costs to the state of $287,975.78. There were also improvements in member health with decreases in clinical indicators of 27.5%.

References:

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Table 1. Second-Generation Antipsychotics Maximum Doses (excludes injectable dosage forms)[8]

Drug (generic)	Drug (brand)	Texas PEFC Literature-Based Maximum Dosage* (mg/day)
aripiprazole	Abilify® Abilify Discmelt®	Age 4-11 years: 15 Age 12 to 17 years: 30
asenapine	Saphris®	Age 10 to 17 years: 20
brexpiprazole	Rexulti®	Age <18 years: Not FDA Approved
cariprazine	Vraylor®	Age <18 years: Not FDA Approved
clozapine	Clozaril®	Age 8-11 years: 300 Age 12 to 17 years: 600 mg
iloperidone	Fanapt®	Age <18 years: Not FDA Approved
lurasidone	Latuda®	Age 10 to 17 years: 80[9]
olanzapine	Zyprexa®, Zyprexa Zydis®	Age 4 to 6 years: 12.5 Age 6 to 17 years: 20
paliperidone	Invega®	Age 12 to 17 years: 12
quetiapine	Seroquel®, Seroquel XR	Age 5 to 9 years: 400 Age 10 to 17: 800
risperidone	Risperdal® Risperdal M-TAB®	Age 4 to 11 years: 3 Age 12 to 17: 6
ziprasidone	Geodon®	Age 10 to 17 years: 160

*Some literature-based maximum dosages published by PEFC are weight-based. For more information, refer to the full publication at: https://hhs.texas.gov/sites/default/files/documents/doing-business-with-hhs/provider-portal/facilities-regulation/psychiatric/psychotropic-medication-utilization-parameters.pdf.

Table 2. First-Generation Antipsychotics Maximum Doses (excludes injectable dosage forms)[8]

Drug (generic)	Drug (brand)	Texas PEFC Literature-Based Maximum Dosage* (mg/day)
chlorpromazine	Thorazine® (brand name discontinued)	Age < 5 years: 40 Age 5-12 years: 75 Age > 12 years: 800
haloperidol	Haldol® (brand name discontinued)	Age 3-12 years: 6 mg Age >12 years: 15
perphenazine	Trilafon® (brand name discontinued)	Age > 12 years: 64
pimozide	Orap®	Age 7-12 years: 6 Age ≥ 12 years: 10

*Some literature-based maximum dosages published by PEFC are weight-based. For more information, refer to the full publication at: https://hhs.texas.gov/sites/default/files/documents/doing-business-with-hhs/provider-portal/facilities-regulation/psychiatric/psychotropic-medication-utilization-parameters.pdf.