Drug Use Research & Management Program
Oregon State University, 500 Summer Street NE, E35
Salem, Oregon 97301-1079
Phone 503-947-5220 | **Fax** 503-947-1119

Policy Evaluation: Benzodiazepines

Research Questions:

1. Has the proportion of patients receiving benzodiazepines for long-term use (more than 4 weeks every 4 months) decreased since implementation of the prior authorization (PA) criteria?
2. Are there any subgroups of patients based on drug therapy, patient characteristics (i.e. coordinated care organization [CCO] enrollment, age, or mental health diagnosis), concurrent medications (sedating therapy, antidepressant, or antipsychotic use), or prescriber characteristics (i.e. provider specialty) who more commonly receive long-term therapy beyond 4 weeks?
3. For patients on long-term therapy, what proportion of patients had a change in benzodiazepine treatment (i.e. treatment discontinuation, change in medication, increase in dose, or decrease in dose) after implementation of the policy?
4. Has there been a change in emergency department (ED) visits, hospitalizations, benzodiazepine overdose, or sedative overdoses since implementation of the PA criteria?
5. Did members have an increased number of hospitalizations or ED visits following a denied benzodiazepine claim?

Conclusions:

1. After implementation of the policy, there were fewer patients prescribed long-term benzodiazepine therapy.
    a. Before implementation of the policy, approximately 56% of the patients newly started on benzodiazepines were prescribed benzodiazepines for greater than 30 days compared to 42% after implementation of the policy.
    b. The number of new start patients who transitioned to continuous benzodiazepine therapy (represented by a proportion of days covered [PDC] >75%) decreased from 8.7% to 2.6%, and patients with PDC of 26-75% (representing intermittent therapy) decreased from 28% to 19%.
    c. Similarly, there was a slight decrease in the number of patients on long-term therapy with subsequent claims associated with benzodiazepine poisoning, accidental poisoning, or benzodiazepine-related adverse effects (**Figure 2**). However, rates of overall poisoning from any sedative were relatively unchanged (**Figure 3**).
2. Subgroup analyses based on patient characteristics, concurrent medications, and prescriber characteristics
    a. Overall demographics for patients prescribed short-term and long-term benzodiazepine use were similar. Benzodiazepines are most commonly prescribed for adults (88%) and for female members (69%).
    b. Patients with a history of long-term benzodiazepine use had more medical claims associated with mental health diagnoses (90%) compared to patients with short-term use (84%). Similarly, compared to patients who were treatment naïve, patients with a history of long-term benzodiazepine use had more frequent utilization of selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs; 50%), other antidepressants (29%), and second generation antipsychotics (23-24%). Overall, utilization for mental health drugs was similar before and after implementation of the policy.

Author: Sarah Servid, PharmD

Date: September 2018

c. Overall, benzodiazepines (for any duration of therapy) are most commonly prescribed by general practitioners including family practitioners, internists, physician assistants, and family nurse practitioners. Specialists in mental health (psychiatrists and psychiatric mental health nurse practitioners) were more likely to prescribe long-term benzodiazepine therapy.

3. In patients with a history of long-term benzodiazepine use, approximately 23-26% of patients had a change in benzodiazepine drug or dose based on claims history, and approximately 9.5% of patients with long-term benzodiazepine use had a denied benzodiazepine claim. Of the patients with a denied claim, 58% had a subsequent paid claim within the next 30 days indicating that a prior authorization was submitted for these patients. Another 20% of patients had a paid benzodiazepine claim within 90 days of the initial denial.
4. Overall, there was no change in rate of hospitalization or ED visits upon comparison of rates before and after implementation of the policy. For patients with a history of short-term use, rates of hospitalization and emergency department visits were maintained at 4.5% and 22%, respectively. Overall rates of hospitalization and ED visits also remained unchanged for patients on long-term benzodiazepine therapy after implementation of the policy (2% and 12%, respectively).
5. For members included in the analysis, only 7.2% of hospitalizations and 8.8% of ED visits occurred following a denied benzodiazepine claim. In patients defined as having a history of long-term benzodiazepine use, only 6% of ED visits and hospitalizations occurred after a denied benzodiazepine claim, and the majority of medical visits occurred following paid claims for a benzodiazepine (80% of ED visits and hospitalizations).

Recommendation:

- Update PA criteria for benzodiazepines (**Appendix 1**).

Background:

Benzodiazepines are commonly prescribed in Oregon for a variety of mental health conditions. The United States Food and Drug Administration (FDA) labeled indications for benzodiazepines include anxiety, panic disorder, alcohol withdrawal, and seizures. Some benzodiazepines such as lorazepam are also FDA indicated for insomnia, and they can be used off-label for schizophrenia, depression, acute stress disorders, agitation, or bipolar disorder.

A recent Drug Effectiveness Review Project (DERP) report documented the limited evidence for long-term treatment with benzodiazepines.[1] Available evidence was often limited to less than 8 weeks of treatment, and even evidence supporting short-term efficacy compared to alternative treatments was of poor quality.[1] For the treatment of panic disorder, post-traumatic stress disorder (PTSD), and depression, the majority of evidence compared benzodiazepines to tricyclic antidepressants (TCAs). There was low quality evidence that benzodiazepines had statistically improved response rates compared to TCAs (RR 1.13; 95% CI 1.01 to 1.27) for panic disorder, but there was insufficient evidence to support treatment for other conditions.[1] Similarly, there was insufficient evidence to compare effectiveness of benzodiazepines to selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs), and recently updated guidelines from the Veterans Administration and Department of Defense recommend against the use of benzodiazepines (as monotherapy or combination therapy) for treatment of PTSD.[2] For the treatment of general anxiety disorder, there was low quality evidence of no difference in treatment response between antidepressants (SSRIs, SNRIs, or TCAs) and benzodiazepines over 4 to 8 weeks.[1] Compared to patients treated with TCAs, fewer patients treated with benzodiazepines for anxiety discontinued treatment though the reasons for treatment discontinuation were not reported.[1] Similarly, evidence for the treatment of schizophrenia was limited to comparisons with older antipsychotics (primarily haloperidol and chlorpromazine) with insufficient evidence to determine differences in efficacy between these agents.

In addition, there is low quality evidence from observational studies to indicate that concomitant use of benzodiazepines and opioid medications may be associated with increased risk of death.[1] Due to the retrospective nature of these data, the exact risk associated with concomitant benzodiazepines and opioids

is unclear. However, because of the concerning nature of these trends, FDA labeling for all benzodiazepines has been updated with a boxed warning detailing the risk of profound sedation, respiratory depression, coma and death associated with concomitant use of benzodiazepines and opioids.[3]

In Oregon, the majority of benzodiazepines (with the exception of sedative benzodiazepines and clonazepam) are classified as carve-out medications and are paid for by fee-for-service (FFS), unlike physical health drugs which are paid by the patient's CCO. In the second quarter of 2017 (4/1/17 to 7/31/17), over 18,800 patients had more than 31,000 claims for a benzodiazepine listed in **Appendix 2**. Sedative benzodiazepines for the treatment of sleep disorders (including triazolam and temazepam) are managed under separate PA criteria which ensure therapy is prescribed for funded indications, for appropriate duration, and not prescribed in combination with other sedating medications. All other oral benzodiazepines are managed by the PA criteria in **Appendix 1**. These criteria were implemented in July 2016 for patients receiving benzodiazepines for a duration longer than 4 weeks. The primary goal of the policy was to decrease the proportion of patients on inappropriate long-term benzodiazepine therapy with the hope that it would prevent adverse effects associated with long-term benzodiazepine use. Secondary goals of this evaluation include assessment of unintentional harms including hospitalizations and ED visits as a result of this policy and identification of areas for policy improvement. Due to the large volume of patients in the population who utilize benzodiazepines, the PA focused on targeting patients newly started on a benzodiazepine. Any patient who had a claim for a benzodiazepine in the 2 months prior to implementation of the policy (including new start patients and patients on long-term therapy) were grandfathered by implementing long-term PAs for their current therapy. Patients impacted by this policy included FFS patients prescribed benzodiazepines (excluding sedative benzodiazepines such as triazolam or temazepam) or patients enrolled in a CCO who received a carve-out benzodiazepine (including lorazepam, diazepam, alprazolam, oxazepam, or chlordiazepoxide) beyond 4 weeks. In addition, this policy may occasionally apply to patients on chronic therapy if they are new to Oregon Health Plan (OHP) or were originally grandfathered but have a change in drug or dose. Short-term use of benzodiazepines (4 weeks every 4 months) does not require a PA. Long-term therapy can be approved for the following diagnoses: diagnosis of malignant neoplasm or other end of life diagnosis, diagnosis of epilepsy, or an OHP-funded diagnosis with clinical rationale to support long-term benzodiazepine use. OHP funded indications are only approved if the patient also meets the following criteria: no history of substance abuse and no concurrent sedative, hypnotic, or opioid use. Prior to implementation of the policy, both providers and pharmacies were notified of these changes in OHP policy.

Methods:

This uncontrolled before-and-after analysis compared utilization of benzodiazepines in a historical control group of patients before the implementation of the PA (from 7/1/15 to 6/30/16) to patients after implementation of the policy (from 7/1/16 to 6/30/17). The analysis was divided into 2 distinct populations: patients were treatment naïve or on short-term benzodiazepine therapy (≤30 days in the 120 days prior to the index event [IE]) and patients who were on chronic benzodiazepine therapy (>30 days in the 120 days prior to the IE). In order to avoid counting patients multiple times over the same period, the IE was defined as the first denied or paid FFS claim for greater than 5 days' supply for a benzodiazepine within the each reporting period. If a patient had multiple claims for a benzodiazepine within this time frame, the first claim in the reporting period (the index event) was used to classify the patient according to paid or denied status. Any subsequent paid or denied benzodiazepine claims for a patient were evaluated to calculate days' supply but were not generally evaluated for status (paid or denied). Patients with only claims for 1-5 days were excluded as these patients were likely prescribed benzodiazepines for pre-procedure or urgent use only. Denied claims were defined as claims with an error code of 6507 ("Pharmacy Policy – Benzodiazepine Limits") and without any of the error codes listed in **Appendix 3**. Baseline characteristics and CCO enrollment were assessed at time of the IE.

Chronic (or long-term) therapy was defined as greater than 30 days of treatment in the 120 days prior to the index event. Treatment naïve patients or patients on short term therapy were defined as having PDC of less than or equal to 30 days in the 120 days prior to the index event.

Patients were excluded from the study if they had any of the following benefit packages which indicate patients with Medicare or a limited Medicaid drug benefit: BMM, BMD, MND, MED, CWM, SMF, SMB or MED. Patients were also excluded if they had eligibility of less than 75% of combined FFS and CCO days (approximately 9 months total enrollment) in the period of time from 6 months before to 6 months after the IE.

Under the current policy, patients on benzodiazepine therapy prior to implementation of the policy were grandfathered at their current dose. However, a PA would be required for any patients who had a change in therapy or dose, and any patients on long-term therapy would be asked to either taper their dose or provide appropriate rationale for long-term treatment with a benzodiazepine. For patients on long-term therapy, the number of patients with changes in therapy including increasing dose, decreasing dose, or switching medications in the 6 months following the IE was documented. The baseline daily dose was defined as the average daily dose for benzodiazepine claims in the 120 days prior to the IE. Claims were assessed in the 6 months following the IE to determine if therapy was changed to a different benzodiazepine or patients had paid claims for a higher or lower daily dose. Patients were classified as having a change in dose if, in the 6 months following the IE, the average dose for the proportion of covered days was at least 1 mg per day higher or lower than the average dose assessed prior to the index event.

For treatment naïve patients or patients on short-term benzodiazepine therapy, ongoing therapy for increased doses or switching medications was also documented in the 6 months following the IE. The proportion of patients who transitioned to long-term treatment was estimated using average number of covered days and the proportion of days covered (PDC) in the 6 months following the IE. Current policy would allow for approximately 45 days of therapy over 6 months without PA. Short-term therapy over a period of 6 months would correspond to a PDC of up to 25% (≤45 days), intermediate therapy corresponds to PDC of 25-75% (46 to 135 days), and long-term therapy corresponds to a PDC greater than 75% (>135 days every 6 months). Short-term therapy would not require PA, whereas intermittent or long-term therapy would require PA approval. Intermittent therapy may indicate therapy of medium duration, sporadic “as needed” usage, or low adherence to continuously prescribed therapy.

Diagnoses of epilepsy was identified via medical claims indicating a diagnosis in the 2 years prior to the IE (see **Appendix 5** for diagnosis codes). In addition, patients were categorized based on diagnosis identified in 2 years prior to the IE using diagnosis codes in **Appendix 5.** Patients prescribed concomitant sedating medications including opioids, sedatives, or muscle relaxants were quantified. Concomitant therapy for sedating medications was defined as greater than 30 overlapping days’ supply following the IE with benzodiazepine and sedating mediations based on FFS or CCO pharmacy claims. Similarly, the proportion of patients with a history of claims for an antidepressant or antipsychotic medications in the 120 days prior to the IE was documented. A list of included medications is available in **Appendix 4**.

Potential benefits of the policy were assessed through evaluation of benzodiazepine or sedative poisoning or overdose. Overall rates of benzodiazepine-related poisoning, accidental poisoning, and adverse effects were identified with diagnosis codes in **Appendix 5**. Diagnoses for benzodiazepine use were evaluated in the month following a paid claim. Respiratory depression and overdose may also often occur upon concomitant use of multiple sedating medications and diagnoses used for billing may not accurately represent the specific sedating medications involved. Therefore, the rate of overdose and poisoning from any sedating medication was also evaluated. Overdose or poisoning associated with sedating medications included a broad variety of classes such as benzodiazepines, opioids (both prescription and illicit), alcohol, tricyclic antidepressants, sleep medications, barbiturates, other anesthetics, muscle relaxants, cold drugs, and respiratory depressants which were not otherwise specified.

Patients potentially paying cash for claims were identified using a proxy based on denied claims. Patients were classified as potentially paying cash if they had had at least 2 distinct denied claims occurring at least 5 days apart in the 120 days following an initial benzodiazepine denial AND within 4 days of both denied

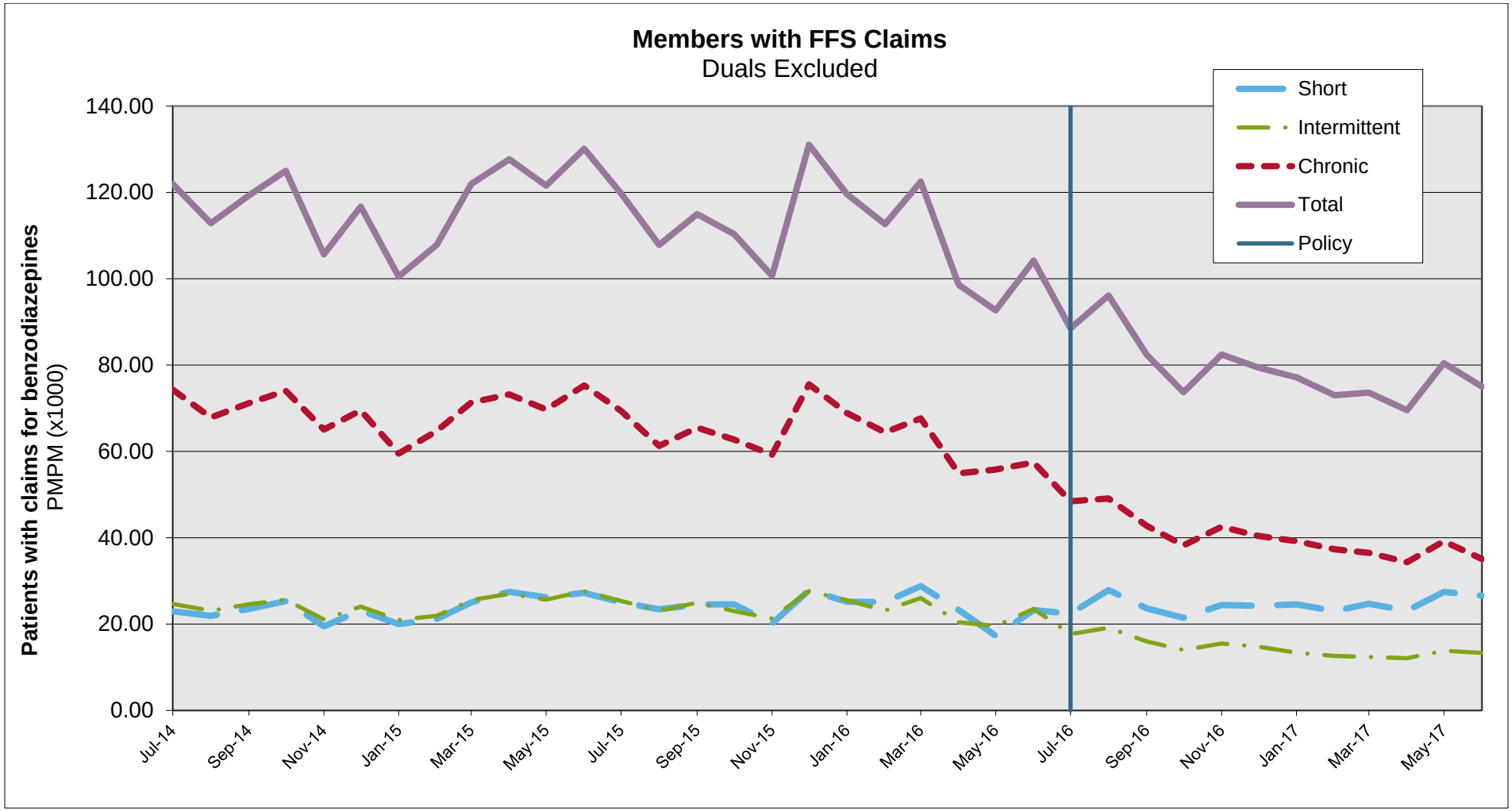
claims, did not have a paid claim for a benzodiazepine. Denied claims were counted only once if there were multiple denials for a claim with same prescription number and refill quantity.

Potential harms as a result of the policy were assessed through examination of emergency department visits, hospitalizations (**Appendix 6**), and associated diagnostic codes (**Appendix 5**). This initial analysis of harms categorized patients according to the first benzodiazepine claim in the reporting period (the IE), and subsequent paid or denied benzodiazepine claims may not be captured in the analysis. Using this method avoids counting patients multiple times, but it may also potentially miss valuable information in patients with subsequent paid or denied benzodiazepine claims. Due to these limitations with the initial analysis, a post-hoc analysis was conducted to further evaluate patients who may have had multiple medical encounters or multiple denied claims over the course of the evaluation period. All ED visits and hospitalizations for all patients in the pre-specified populations were categorized into the following groups according to the most recent paid or denied benzodiazepine claim occurring within 90 days before the encounter: 1) encounters with a paid benzodiazepine claim prior to the event, 2) encounters with a denied benzodiazepine claim prior to the event, 3) encounters without a benzodiazepine claim within 90 days before the event. If a patient had both a paid and denied claim on the same day, the encounter was categorized as paid. This analysis captures all ED visits or hospitalizations for the patients during the study period, and patients would be counted more than once if they had multiple medical visits. Subsequently, data for this analysis may be more heavily influenced by members with frequent ED visits or hospitalizations.

Results:

The proportion of members who continue to receive benzodiazepines as long-term therapy after an initial claim is shown in **Figure 1**. After implementation of the policy there was a decrease in the total number of patients with claims for a benzodiazepine and the number of patients with claims for chronic benzodiazepine use (>90 days of benzodiazepine therapy following the IE). The number of patients classified as using benzodiazepines short-term (6-30 days of benzodiazepine therapy in the 120 days following their first claim) remained unchanged following implementation of the policy.

Figure 1. Unique patient count of Medicaid members (FFS and CCO) with a FFS benzodiazepine claim in the past 3 years from 7/1/14 to 3/1/18 stratified by treatment duration. Short-term benzodiazepine use was classified as having a PDC (including both CCO and FFS claims) of 6-30 days following the IE, patients with intermittent benzodiazepine treatment were classified as having a PDC of 31-89 following the IE, and chronic use was classified as greater than 90 days of therapy following the IE.

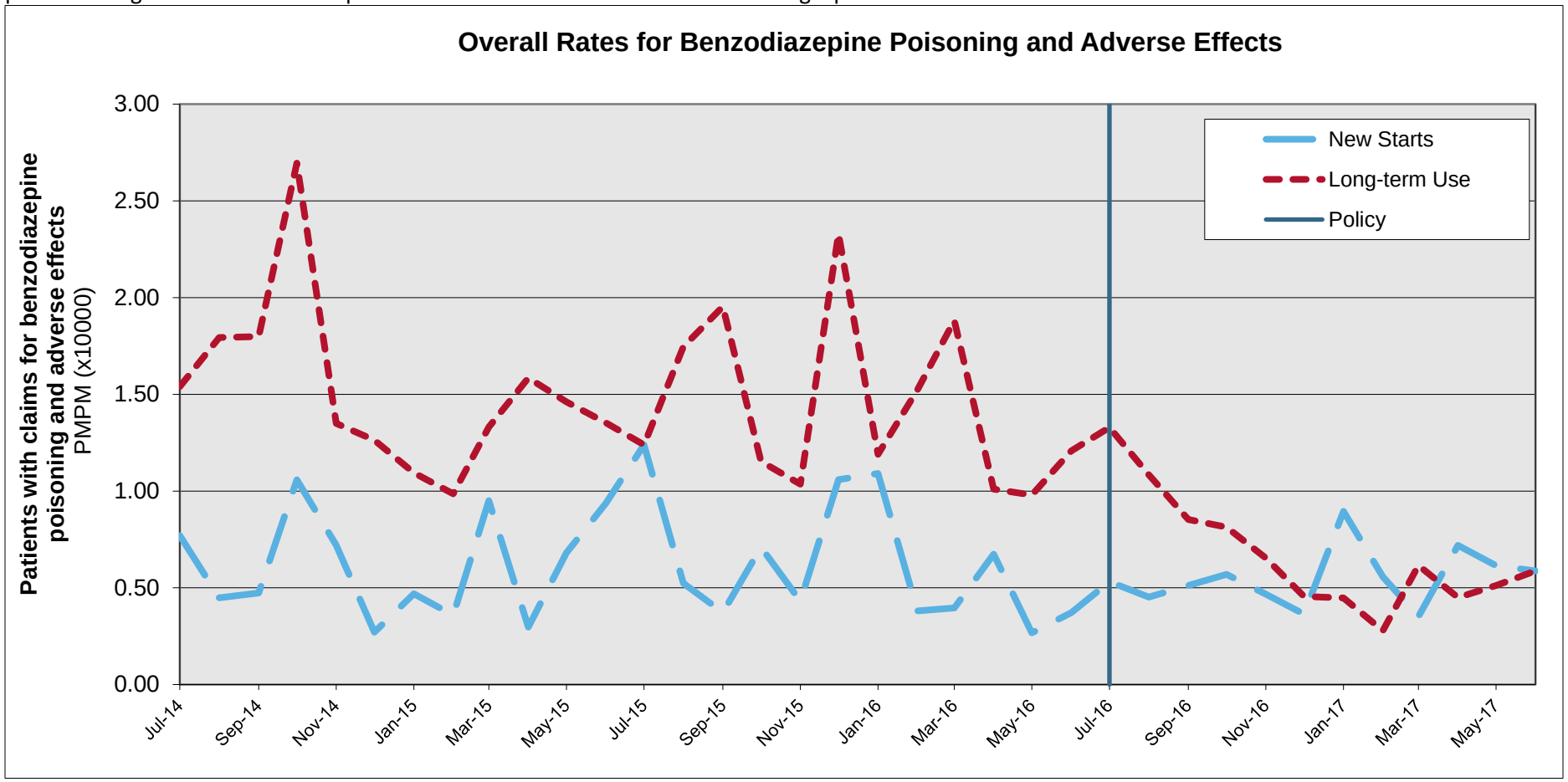


Author: Servid

Date: September 2018

Since implementation of the policy, the overall rate of benzodiazepine poisonings and adverse events has declined for members with a history of long-term use (**Figure 2**). This coincides with a decline observed in the number of patients prescribed long-term benzodiazepine therapy. Comparatively there was little change in the overall rate of poisoning from any sedative (**Figure 3**). It's unclear if the decline in benzodiazepine poisoning and adverse effects is entirely due to policy implementation or if it may be partially impacted by changes in the population over time. The majority of patients on long-term therapy were grandfathered prior to policy implementation. Unless these patients had a change in therapy, they would not be subject to the current policy. If a patient on long-term therapy had a change in dose or drug resulting in a denied claim, providers who submitted a PA were asked to justify necessity of continued long-term use or to develop a taper plan. In addition, after policy implementation, fewer new-start patients transitioned to long-term therapy. These combined factors may have resulted in a smaller overall population of patients on long-term treatment or changes in the population of patients which may impact overall rates of poisoning and adverse effects.

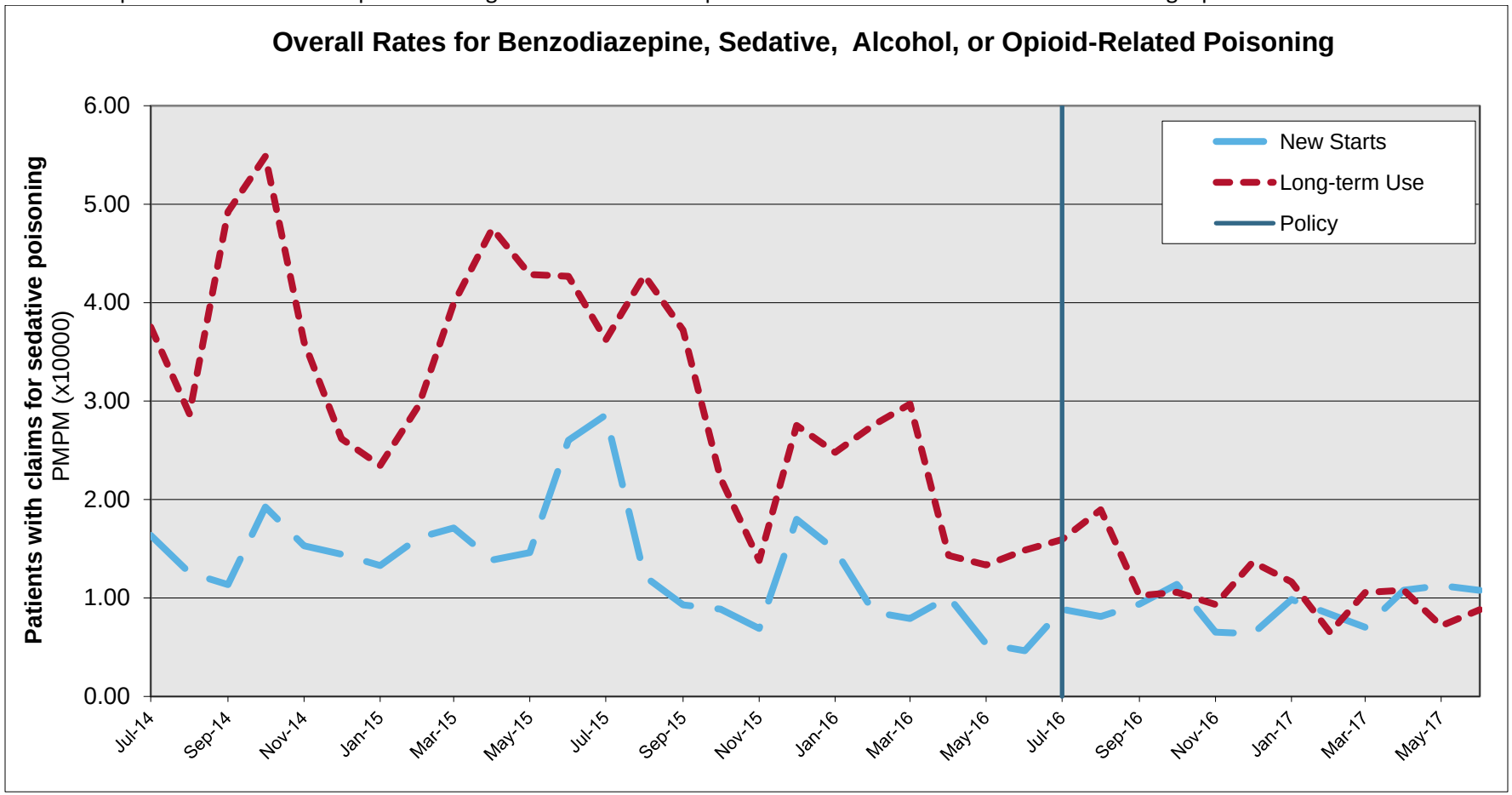
Figure 2. Overall rates of benzodiazepine poisoning, accidental poisoning, and adverse effects for patients with long-term benzodiazepine use and new start patients. Diagnosis for benzodiazepine use was evaluated in the month following a paid claim.



Author: Servid

Date: September 2018

Figure 3. Overall rates of benzodiazepine, sedative, alcohol, or opioid poisoning, suicide by poisoning or accidental poisoning for patients with long-term benzodiazepine use and new-start patients. Diagnosis for benzodiazepine use was evaluated in the month following a paid claim.



Demographics for patients classified as chronic users or short-term/treatment naïve patients are shown in **Table 1**. Overall, populations were similar before and after implementation of the policy with the exception of white patients which has decreased over time. With a few exceptions discussed below, overall rates were also very similar between patients with either a paid or denied IE (data not shown). For patients with a history of long-term use (>30 days), average duration of therapy was similar after implementation of the policy for patients with continued paid claims. In patients with denied claims, average days' supply was decreased from 134 days to 88 days. This is expected given that the majority of patients with a history of benzodiazepine use were grandfathered prior to implementation of the policy. If a patient on long-term therapy had a change in dose or drug resulting in a denied claim, providers who submitted a PA were asked to justify necessity of continued long-term use or to develop a taper plan. In treatment naïve patients or patients with a history of short-term use (≤30

days), average days of coverage for was reduced from 50 days before policy implementation to 34 days after policy implementation. Current policy would allow for 30 days every 120 days or approximately 45 days every 6 months without PA.

Table 1. Baseline demographics for all IE. PDC in the 6 months following the index claim was evaluated to assess duration of therapy.

	Before		After	
N=	**31,788**		**28,149**	
New Starts and History of Short-term Use	**21,509**		**19,107**	
Mean age (range)	40	0-87	40	0-93
<13	325	1.5%	302	1.6%
13-18	688	3.2%	623	3.3%
19-60	19,145	89.0%	16,905	88.5%
>60	1,351	6.3%	1,277	6.7%
Female	15,013	69.8%	13,226	69.2%
White	6,467	30.1%	4,023	21.1%
Native American	977	4.5%	867	4.5%
Index Drug				
Alprazolam (carve-out)	6,364	29.6%	5,690	29.8%
Diazepam (carve-out)	3,883	18.1%	3,182	16.7%
Lorazepam (carve-out)	9,937	46.2%	8,869	46.4%
Clonazepam (FFS)	678	3.2%	682	3.6%
Other (carve-out)	647	3.0%	684	3.6%
Days of Coverage in 6 months after index (avg, range)	50.1	(6-185)	34.1	(0-185)
History of Long-term Use	**10,279**		**9,042**	
Mean age (range)	45	0-91	45	1-92
<13	72	0.7%	73	0.8%
13-18	155	1.5%	129	1.4%
19-60	9,059	88.1%	7,976	88.2%
>60	993	9.7%	864	9.6%
Female	7,124	69.3%	6,202	68.6%
White	4,722	45.9%	3,512	38.8%
Native American	460	4.5%	439	4.9%

Index Drug				
Alprazolam (carve-out)	3,656	35.6%	3,107	34.4%
Diazepam (carve-out)	1,806	17.6%	1,544	17.1%
Lorazepam (carve-out)	3,870	37.6%	3,413	37.7%
Clonazepam (FFS)	707	6.9%	756	8.4%
Other (carve-out)	240	2.3%	222	2.5%
Days of Coverage in 6 months after index (avg, range)	134.2	(6-185)	128.4	(0-185)

The number of patients who continued to receive long-term therapy after implementation of the policy is described in **Table 2**. Duration of therapy is estimated using days of coverage and PDC in the 6 months following the IE. Current policy would allow a patient to fill approximately 45 days every 6 months (or up to 25% PDC) without PA. Since implementation of the policy, the number of treatment naïve patients who transition to long-term therapy has decreased. Patients on continuous benzodiazepine therapy (represented by PDC >75%) decreased from 8.7% to 2.6% and patients with PDC of 26-75% decreased from 28% to 19% after policy implementation. The average days of coverage also decreased from 50 days to 34 days after implementation of the policy in patients with a history of short-term use. In patients with a history of long-term use, days of coverage were similar before and after policy implementation, though there was a slight decrease in the number of patients receiving continuous benzodiazepine therapy for more than 75% of days in the 6 months following the first claim in the reporting period (from 58.7% to 54.5%).

Table 2. Total number of patients continuing to receive long-term or short-term benzodiazepine therapy after the index event.

	Before		**After**	
All patients with a paid or denied claim	**31,788**		**28,149**	
Patients with >30 days coverage in 120 days following the IE	17,924	56.4%	11,701	41.6%
Patients with <=30 days coverage in 120 days following the IE	13,864	43.6%	16,448	58.4%
New starts and short-term use (history of use <=30 days prior to the IE)	**21,509**		**19,107**	
Days of Coverage in 6 mo. after IE (average, range)	50	6-185	34	0-185
PDC <= 25%	13,514	62.8%	14,883	77.9%
PDC 26%-75%	6,026	28.0%	3,627	19.0%
PDC > 75%	1,875	8.7%	496	2.6%
History of Long-term Use (history of use >30 days prior to the IE)	**10,279**		**9,042**	
Days of Coverage in 6 mo. after IE (average, range)	134	6-185	128	0-185
PDC <= 25%	827	8.0%	963	10.7%
PDC 26%-75%	3,393	33.0%	3,126	34.6%
PDC > 75%	6,038	58.7%	4,927	54.5%

Table 3 details the number of patients with a change in drug therapy or baseline dose (estimated as the average dose in the 120 days prior to the IE). PA is required under current policy for any patients with a history of long-term use and a change in their benzodiazepine therapy (despite grandfathering prior to policy implementation). Changes in therapy which would result in PA include changing the strength of prescribed medication (either increasing or decreasing the dose) or changing to a different benzodiazepine. In patients with a history of long-term use, approximately 74-77% were maintained on their current therapy and 23-26% of patients had a change in benzodiazepine drug or dose based on claims history. Overall, approximately 9% of patients (new starts and long-term benzodiazepine users) had a denied IE after implementation of the policy. In patients with a history of long-term use, denied claims were most common for patients with changes in therapy and accounted for approximately 70% of denied IE compared to patients without significant changes in therapy (31% of patients with a denied IE).

Table 3. Proportion of patients with a change in therapy or dose. Population represents all index events.

	Before		After	
N=	**31,788**		**28,149**	
New Starts and Short-term Use	**21,509**		**19,107**	
No change in drug or dose	10,432	48.5%	10,006	52.4%
Higher average daily dose	10,323	48.0%	8,514	44.6%
Any change in drug	1,654	7.7%	1,077	5.6%
History of Long-term Use	**10,279**		**9,042**	
No change in drug or dose	7,580	73.7%	6,953	76.9%
Patients with a change in dose	1,624	15.8%	1,142	12.6%
Lower average daily dose	762	7.4%	597	6.6%
Higher average daily dose	862	8.4%	545	6.0%
Any change in Drug	1,648	16.0%	1,268	14.0%

Table 4 shows the top 10 types of providers who most commonly prescribe benzodiazepines. Upon comparison of patients with either a paid or denied IE, rates were similar between groups (data not shown) with differences ranging from 0-4% for new start patients and 0-6% for patients on long-term therapy. The most common prescribers who initiate benzodiazepine therapy in treatment naïve patients or patients with a history of short-term use are family practitioners (24%), internists (12%), physician assistants (12%) and family nurse practitioners (11%). After implementation of the policy, duration of therapy prescribed from all providers initiating therapy in treatment naïve patients (with the exception of emergency care providers) decreased by an average of 11 to 30 days. Prior to initiation of the policy, the average number of days covered was 42 to 73 days for the top 5 prescriber types. After the policy implementation, average duration had decreased to 30-45 days. The average days of benzodiazepine therapy was longer for patients whose therapy was initiated by a specialist including psychiatrists, psychiatric mental health nurse practitioners, and neurologists (average 44 to 46 days after policy implementation).

For patients with a history of long-term benzodiazepine use, therapy was most commonly prescribed by family practitioners (24-26%), internists (14%), psychiatrists (10%), psychiatric mental health nurse practitioners (10%), and family nurse practitioners (9%). Treatment duration was relatively unchanged after implementation of the policy (115-145 days of coverage), which is expected given the majority of patients on long-term therapy would have been grandfathered on their current therapy prior to implementation of the policy.

Table 4. Number and duration of use for patients stratified by primary provider taxonomy for providers who most commonly prescribe benzodiazepines (top 10 prescriber types). Population represents all index events.

		Before			After		
		Paid Index Events		Days of Coverage in 6 months after IE	All Index Events		Days of Coverage in 6 months after IE
	N=	31,788			28,149		
New Starts and Short-term Use		**21,509**	**%**	**Avg**	**19,107**	**%**	**Avg**
1	Family Practitioner	5,302	24.7%	50.0	4,536	23.7%	34.0
2	Internist	2,603	12.1%	49.6	2,276	11.9%	34.3
3	Physician Assistants	2,514	11.7%	42.4	2,313	12.1%	30.0
4	Family Nurse Practitioner	2,293	10.7%	51.6	2,090	10.9%	33.5
5	Psychiatrist	1,273	5.9%	72.9	1,153	6.0%	45.5
9	Emergency Med Practitioner	1,044	4.9%	20.0	762	4.0%	17.4
7	Nurse Practitioner (default Spec)	925	4.3%	57.6	905	4.7%	38.5
6	Psychiatric Mental Health Nurse Practitioner	907	4.2%	76.2	936	4.9%	46.2
8	Advance Practice Nurse	774	3.6%	57.3	604	3.2%	39.2
10	Neurologist	352	1.6%	55.2	311	1.6%	44.2
History of Long-term Use		**10,279**	**%**	**Avg**	**9,042**	**%**	**Avg**
1	Family Practitioner	2,703	26.3%	133.0	2,219	24.5%	127.2
2	Internist	1,458	14.2%	134.2	1,208	13.4%	133.0
3	Psychiatrist	1,072	10.4%	139.7	975	10.8%	132.5
4	Psychiatric Mental Health Nurse Practitioner	1,009	9.8%	142.1	894	9.9%	133.5
5	Family Nurse Practitioner	890	8.7%	127.2	833	9.2%	121.6
6	Physician Assistants	689	6.7%	127.3	664	7.3%	121.0
7	Nurse Practitioner (default Spec)	492	4.8%	133.4	523	5.8%	128.9
8	Advance Practice Nurse	484	4.7%	139.5	414	4.6%	130.0
9	Neurologist	220	2.1%	147.8	213	2.4%	145.4
10	Emergency Med Practitioner	90	0.9%	126.1	96	1.1%	115.4

Table 5 describes common diagnoses of interest in patients prescribed benzodiazepines. In patients with a history of short-term benzodiazepine use, approximately 85% of the population had OHP-funded mental health diagnoses, 6% had indications for unfunded diagnoses without any documented funded diagnosis, and 10% had no documented indication for benzodiazepine treatment. Over 60% of treatment naïve patients prescribed benzodiazepines had anxiety

disorders, 47-49% of patients had depression or another mood disorder, and 13-15% had panic disorder. Rates for subgroups of patients with paid or denied IE followed similar trends with only small differences between patients with a paid IE and those with a denied IE (data not shown). Of interest, approximately 19-21% of patients had a diagnoses of PTSD or acute stress disorders and 20% of the population had diagnoses indicating a history of substance abuse. Current guidelines recommend against the use of benzodiazepines (as monotherapy or combination therapy) for treatment of PTSD due to limited evidence of efficacy and know risks associated with treatment.[2] However, in patients with multiple diagnoses, it is unclear what specific diagnosis may be related to benzodiazepine treatment based on analyses of claims data. In addition, diagnoses based on claims data may be incomplete.

Similar trends were observed in patients with a history of long-term benzodiazepine use. The most common diagnoses included anxiety (68-71%), depression/mood disorders (54-56%), PTSD/acute stress disorders (27-28%), bipolar disorder (20%), and panic disorder (16-18%). Diagnoses for substance abuse were present in 19-25% of the population and approximately 3-5% of patients had no documented indication for benzodiazepine treatment. Of the patients with a denied index event after implementation of the policy, more patients had a diagnosis of depression or mood disorder (65%), PTSD or acute stress disorder (40%), bipolar disorder (30%), or substance abuse disorder (36%) compared to the overall population or patients with a paid IE (56%, 28%, 19%, and 25% respectively). The overall proportion of patients with a paid or denied IE was similar for patients with other diagnoses.

Table 5. Benzodiazepine utilization stratified by diagnoses of interest identified in the 2 years prior to the index event. Patients may have more than one funded diagnosis. Patients are listed with other conditions only if they do not have another funded diagnosis.

	Before			After		
	Paid Index Events		Days of Coverage in 6 months after IE	All Index Events		Days of Coverage in 6 months after IE
N=	**31,788**			**28,149**		
New Starts and Short-term Use	**21,509**	%	**Avg**	**19,107**	%	**Avg**
Funded conditions	18,166	84.5%	50.9	16,669	87.2%	34.6
Anxiety disorders	13,291	61.8%	51.4	12,625	66.1%	34.9
Depression or other mood disorder	10,119	47.0%	53.2	9,413	49.3%	35.4
Substance Abuse	4,448	20.7%	50.6	4,632	24.2%	33.1
PTSD or acute stress disorder	4,026	18.7%	58.2	4,062	21.3%	37.5
Panic disorder	2,871	13.3%	52.2	2,858	15.0%	35.7
Bipolar disorder	2,550	11.9%	62.5	2,375	12.4%	40.1
Malignant Neoplasm or other end of life diagnosis	2,358	11.0%	49.1	1,846	9.7%	35.9
Epilepsy	1,226	5.7%	51.5	1,469	7.7%	35.5
Schizophrenic disorders	761	3.5%	68.6	792	4.1%	43.1
Other conditions	1,384	6.4%	43.7	1,115	5.8%	29.1
Back and spine conditions (funded)	1,072	5.0%	41.9	884	4.6%	27.5
Fibromyalgia and chronic pain (unfunded)	431	2.0%	48.3	364	1.9%	32.0
Insomnia (unfunded)	344	1.6%	50.4	308	1.6%	30.8

None of the Above	1,959	9.1%	47.5	1,323	6.9%	32.6
History of Long Term Use	**10,279**	%	**Avg**	**9,042**	%	**Avg**
Funded conditions	9,260	90.1%	134.4	8,404	92.9%	128.2
Anxiety disorders	6,985	68.0%	133.1	6,558	72.5%	126.5
Depression or other mood disorder	5,577	54.3%	132.7	5,161	57.1%	126.6
PTSD or acute stress disorder	2,734	26.6%	135.0	2,613	28.9%	125.9
Bipolar disorder	2,017	19.6%	136.7	1,846	20.4%	127.7
Substance Abuse	1,980	19.3%	133.4	2,379	26.3%	124.7
Panic disorder	1,677	16.3%	133.7	1,671	18.5%	127.2
Malignant Neoplasm or other end of life diagnosis	1,297	12.6%	133.2	910	10.1%	127.4
Schizophrenic disorders	809	7.9%	147.2	811	9.0%	137.7
Epilepsy	790	7.7%	143.4	884	9.8%	136.0
Other conditions	472	4.6%	133.3	350	3.9%	133.6
Back and spine conditions (funded)	324	3.2%	130.8	267	3.0%	133.3
Fibromyalgia and chronic pain (unfunded)	220	2.1%	131.9	150	1.7%	141.5
Insomnia (unfunded)	139	1.4%	132.3	106	1.2%	127.1
None of the Above	547	5.3%	132	288	3.2%	128.7

Medications of interest for mental health conditions are shown in **Table 6** and are generally consistent with diagnoses observed in **Table 5**. Patients without a history of chronic benzodiazepine use commonly had at least one recent claim for an SSRI, SNRI, or other antidepressant (such as bupropion, trazodone or buspirone). Approximately 12% of treatment naïve patients or patients with a history of short-term benzodiazepine use had recent claims for an antipsychotic. In patients with a history of long-term use, utilization of SSRIs or SNRIs (50%), other antidepressants (29%), and second generation antipsychotics (23-24%) was slightly more frequent than patients who were treatment naïve. Overall, utilization for mental health drugs was similar before and after implementation of the policy.

In patients with a history of long-term use, concomitant use of sedating medications including muscle relaxants and opioids occurred in 9-10% and 17-19% of the population, respectively. There was overall little difference before versus after implementation of the policy.

With a few exceptions, trends were similar in patients with a paid IE versus patients with a denied IE. In new start patients, denied IE was slightly more common for patients with claims for SSRI/SNRIs and second generation antipsychotics (difference of 6% compared to the percent of patients with paid IE). Similar patterns were observed in patients on long-term therapy: patients with claims for SSRIs/SRNIs (56%), other antianxiety medications (37%), and second generation antipsychotics (33%) more commonly had denied IE compared to the proportion of patients with a paid IE (50%, 28%, and 23% respectively). Data is likely influenced partially by disease and symptom severity. Patients are more likely to request long-term benzodiazepine therapy or have changes in their

current therapy (and have a subsequent denied claim) if they have severe or continual symptoms. Patients are also more likely to be on other mental health therapy if they have more severe or continual symptoms.

Table 6. Benzodiazepine utilization stratified by concurrent medications. See **Appendix 4** for a list of medications included in each category.

	Before			After		
	Paid IE		Days of Coverage in 6 months after IE	All IE		Days of Coverage in 6 months after IE
N=	31,788			28,149		
New Starts and Short-term Use	**21,509**	%	**Avg**	**19,107**	%	**Avg**
Sedating medications (Concurrent)						
Muscle relaxants	456	2.1%	107.2	268	1.4%	74.1
Opioid (short- or long-acting)	851	4.0%	107.1	405	2.1%	74.3
Sedatives	130	0.6%	117.0	74	0.4%	80.3
Antidepressants/antianxiety (120 days prior)						
SSRI/SNRI	9,236	42.9%	54.1	8,125	42.5%	36.2
TCA	1,359	6.3%	57.5	1,137	6.0%	38.8
MAOI	4	0.0%	25.0	2	0.0%	12.5
Other	4,719	21.9%	57.5	4,319	22.6%	37.0
Antipsychotics (120 days prior)						
First generation	243	1.1%	66.5	211	1.1%	41.9
Second generation	2,368	11.0%	67.3	2,292	12.0%	42.0
Parenteral	72	0.3%	79.0	137	0.7%	48.0
History of Long-term Use	**10,279**	%	**Avg**	**9,042**	%	**Avg**
Sedating medications (Concurrent)						
Muscle relaxants	962	9.4%	155.3	839	9.3%	152.2
Opioid (short- or long-acting)	2,038	19.8%	153.9	1472	16.3%	150.9
Sedatives	235	2.3%	154.0	204	2.3%	148.7
Antidepressants/antianxiety (120 days prior)						
SSRI/SNRI	5,187	50.5%	132.5	4591	50.8%	126.6
TCA	1,069	10.4%	134.8	890	9.8%	131.2
MAOI	4	0.0%	127.8	4	0.0%	111.3
Other	3,009	29.3%	134.1	2607	28.8%	126.2

Antipsychotics (120 days prior)						
First generation	283	2.8%	148.0	253	2.8%	146.8
Second generation	2,345	22.8%	139.8	2182	24.1%	133.1
Parenteral	67	0.7%	155.6	23	0.3%	134.2

Disposition of denied claims is shown in **Table 7**. Of the patients with a denied benzodiazepine claim, approximately 69% of treatment naïve patients and 77% of patients with a history of long-term use had a subsequent paid claim within 90 days. The vast majority of patients without further benzodiazepine therapy did not have a PA request and a significant number (20% of new starts and 44% of long-term benzodiazepine users) had a pattern of denied claims which may indicate they paid cash for their prescriptions.

Table 7. Disposition of denied pharmacy claims after implementation of the policy. Subsequent benzodiazepine claims were classified as either FFS pharmacy claims or CCO encounter claims for a benzodiazepine.

	New Starts and Short Term Use		**History of Long Term Use**	
	N	%	N	%
Index Event Denied Claim	1,658		858	
Benzodiazepine claim filled within 30 days	914	55.1%	495	57.7%
Benzodiazepine claim filled within 90 days	235	14.2%	168	19.6%
Never had a benzodiazepine claim within 90 days of a denied claim	509	30.7%	195	22.7%
PA not requested in the 5 days before or 30 days after the denied claim	495	97.2%	192	98.5%
PA denied in the 5 days before or 30 days after the initial denied claim	0	0.0%	0	0.0%
Never received drug and had diagnosis of epilepsy, malignant neoplasm or end of life diagnosis	11	2.2%	2	1.0%
Number of patients potentially paying cash	104	20.4%	85	43.6%

Table 8 compares the incidence of hospitalization and emergency department visits for patients with paid or denied claims for benzodiazepines before and after the policy. Diagnoses of interest included sedative poisoning, suicide or intentional self-harm, epilepsy, malignant neoplasm or other end of life diagnoses, and mental health disorders. In treatment naïve patients, there was no change overall rates for hospitalizations or ED visits before and after implementation of the policy (4-5% and 22-23% respectively). In patients with a history of long-term benzodiazepine use, overall rates of hospitalization and ED visits were also similar before and after the policy (2% and 12%, respectively).

Table 9 examines the number of ED visits or hospitalizations for all members over the course of the entire study period. Medical visits were categorized by the presence or absence of the most recent benzodiazepine claim prior to the event. For the entire population, only 7.2% of hospitalizations and 8.8% of ED visits occurred following a denied benzodiazepine claim. In new start patients and patients with a history of short-term use, hospitalizations and ED visits commonly occurred following a paid benzodiazepine claim (29.7% and 38.3%, respectively) and greater than 50% of events were not temporally related to any benzodiazepine claims prior to the encounter. In this population, less than 10% of ED visits and hospitalizations occurred following a denied benzodiazepine

claim. In patients with a history of long-term use, approximately 80% of ED visits and hospitalizations occurred following a paid benzodiazepine claim. Only a small proportion of ED visits (6%) and hospitalizations (6%) occurred following a denied benzodiazepine claim.

Table 8. Assessment of potential unintended harms and safety signals after implementation of the policy. Harms were defined as events (including hospitalizations, emergency department visits, or death) within 3 months following the IE for patients after implementation of the policy compared to overall rates of hospitalization and emergency department visits before implementation of the policy.

	Before		**After**	
	Paid Index Events		**All Index Events**	
N=	**31,788**		**28,149**	
New Starts and Short-term Use	**21,509**	%	**19,107**	%
Any Hospitalization	967	4.5%	929	4.9%
Any Emergency Department (ED) Visit	4758	22.1%	4436	23.2%
Death	32	0.1%	14	0.1%
Composite including patients with any of the following (patients counted only once):	132	0.6%	170	0.9%
– Hospitalization or ED visit associated with diagnosis of benzodiazepine, sedative, alcohol, or opioid related poisonings, suicide by poisoning, or accidental poisoning	128	0.6%	160	0.8%
– Medical claims for naloxone administration	7	0.0%	14	0.1%
Composite including patients with any of the following (patients counted only once):	983	4.6%	943	4.9%
– Hospitalization or ED visit associated with diagnosis of suicide, intentional or undetermined poisoning, or other intentional self-harm	81	0.4%	78	0.4%
– Hospitalization or ED visit associated with diagnosis of epilepsy, malignant neoplasm or end of life diagnosis	293	1.4%	314	1.6%
– Hospitalization or ED visit associated with a psychiatric diagnosis (bipolar disorder, PTSD or acute stress disorders, depression or mood disorder, schizophrenic disorders, panic disorders, anxiety disorders)	687	3.2%	632	3.3%
History of Long-term Use	10,279	%	9,042	%
Any Hospitalization	221	2.2%	186	2.1%
Any Emergency Department (ED) Visit	1291	12.6%	1112	12.3%
Death	10	0.1%	9	0.1%
Composite including patients with any of the following (patients counted only once):	32	0.3%	48	0.5%
– Hospitalization or ED visit associated with diagnosis of benzodiazepine, sedative, alcohol, or opioid related poisonings, suicide by poisoning, or accidental poisoning	32	0.3%	47	0.5%
– Medical claims for naloxone administration	1	0.0%	1	0.0%

Composite including patients with any of the following (patients counted only once):	201	2.0%	212	2.3%
– Hospitalization or ED visit associated with diagnosis of suicide, intentional or undetermined poisoning, or other intentional self-harm	25	0.2%	25	0.3%
– Hospitalization or ED visit associated with diagnosis of epilepsy, malignant neoplasm or end of life diagnosis	42	0.4%	55	0.6%
– Hospitalization or ED visit associated with a psychiatric diagnosis (bipolar disorder, PTSD or acute stress disorders, depression or mood disorder, schizophrenic disorders, panic disorders, anxiety disorders)	152	1.5%	153	1.7%

Table 9. Count of ED visits and hospitalizations during evaluation periods, by presence or absence of a paid or denied benzodiazepine claim in 90 days prior to the event. Patients with more than one ED visit or hospitalization will be counted more than once.

	Before				After			
	Hospitalizations		ED Visits		Hospitalizations		ED Visits	
All Visits	**5,557**		**17,478**		**4,961**		**15,226**	
Denied benzodiazepine claim before the event					357	7.2%	1,334	8.8%
Paid benzodiazepine claim before the event	2,995	53.9%	10,497	60.1%	2,157	43.5%	7,711	50.6%
No benzodiazepine claim (paid or denied) within 90 days before the event	2,562	46.1%	6,981	39.9%	2,447	49.3%	6,181	40.6%
All Visits for New Starts and Short-term Use patients	**3,964**		**12,096**		**3,628**		**10,667**	
Denied benzodiazepine claim before the event					273	7.5%	1,053	9.9%
Paid benzodiazepine claim before the event	1,606	40.5%	5,934	49.1%	1,077	29.7%	4,084	38.3%
No benzodiazepine claim (paid or denied) within 90 days before the event	2,358	59.5%	6,162	50.9%	2,278	62.8%	5,530	51.8%
All Visits for Long-Term Use patients	**1,593**		**5,382**		**1,333**		**4,559**	
Denied benzodiazepine claim before the event					84	6.3%	281	6.2%
Paid benzodiazepine claim before the event	1,389	87.2%	4,563	84.8%	1,080	81.0%	3,627	79.6%
No benzodiazepine claim (paid or denied) within 90 days before the event	204	12.8%	819	15.2%	169	12.7%	651	14.3%

Limitations:

Several limitations exist as a result of the retrospective nature of this analysis. First, data is based on claims history which may not accurately reflect true patient diagnoses or correlate with actual medication adherence. Both ICD-9 and ICD-10 diagnosis codes were used to identify diagnoses for patients. Though efforts were made to accurately identify comparable codes, there may be differences in diagnoses based on the ICD version for claims identified before and after October 2015 when the ICD-10 version was implemented. In addition, use of proportion of days covered attempts to estimate the frequency which a patient takes a prescription, but accuracy of this method has not been validated and patients may not always be categorized appropriately. For example, a patient with PDC less than 25% over 6 months (defined as short-term therapy) could have up to 45 days of continuous benzodiazepine coverage in the reporting period which could be indicative of long-term therapy initiation. Provider specialization was identified using the National Provider Identifier (NPI) number and the associated

primary provider taxonomy which may also be inaccurate, out-of-date, or incomplete for some providers. Prescribers with multiple specialties or designations may not be identified.

The retrospective nature of the study also does not control for potential unknown confounders which may influence results of the analysis. Potential confounders include changes in the population over time or changes in the general prescribing patterns of providers. For example, data on poisoning and overdose of benzodiazepines or sedatives may be influenced by other statewide initiatives involving opioid prescribing. Similarly, emergency department visits and hospitalizations may be influenced by a variety of factors. Patients with more severe illness or less stable disease are more likely to have denied claims due to changes in therapy and are also likely to visit the ED more frequently. However, overall rate of ED visits and hospitalizations was unchanged over time, and analysis of ED visits and hospitalizations demonstrated that only a small proportion of overall events occurred following a denial for a benzodiazepine.

Another confounding factor may be stability of primary care for the member. Typically upon receipt of a denied claim, the pharmacy will notify the provider that a PA is required, and the provider will submit a PA request if appropriate. However, for almost 23% of patients with a denied claim, a prior authorization request was never submitted from the provider. It's unclear why a PA was never requested for these patients. These patients may have paid cash for the prescription, or if they were transitioning between providers, the PA request may not have reached the correct provider. Because data reflect only claims paid via Medicaid, claims which may be paid with cash or through primary insurance are not captured. Though surrogate estimates based on denied claims indicate some patients may be paying cash for their prescriptions, the method used may not accurately identify people paying cash. The exact percentage of patients who paid cash is unclear.

References:

1. McDonagh M, Crabtree E, Stoner R. Benzodiazepines. Final Summary Review prepared by the Pacific Northwest Evidence-based Practice Center for the Drug Effectiveness Review Project. Oregon Health & Science University, Portland, Oregon. Available with membership in the Drug Effectiveness Review Project. 2017.
2. Management of Posttraumatic Stress Disorder Work Group. VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder. Version 3.0. Washington, DC: Veterans Health Administration and Department of Defense. 2017.
3. Food and Drug Administration. Medical Product Safety Information. http://www.accessdata.fda.gov/scripts/cder/safetylabelingchanges/ Accessed July 13, 2018.

Appendix 1: Prior Authorization Criteria

Benzodiazepines

Goal(s):

- Approve only for OHP-funded diagnoses.
- Prevent inappropriate long-term benzodiazepine use beyond 4 weeks for new starts (no history within the last 120 days).
- Approve long-term use only for indications supported by the medical literature.

Length of Authorization:

- 6 months to 12 months (criteria-specific)

Requires PA:

- All benzodiazepines used beyond 4 weeks. Short-term use does not require PA.

Covered Alternatives:

- Current PMPDP preferred drug list per OAR 410-121-0030 at www.orpdl.org
- Searchable site for Oregon FFS Drug Class listed at www.orpdl.org/drugs/

Approval Criteria		
1. What diagnosis is being treated?	Record ICD10 code	
2. Does the patient have a malignant neoplasm or other end-of-life diagnosis (ICD10 C00.xx-D49.xx or Z51.5)?	**Yes:** Approve for 12 months	**No:** Go to #3

Approval Criteria		
3. Is the diagnosis an OHP-funded diagnosis?	**Yes:** Go to #4	**No:** Pass to RPh. Deny; not funded by the OHP.
4. Does the patient have a seizure disorder diagnosis?	**Yes:** Approve for 12 months	**No:** Go to #5
5. Is the prescriber enrolled in the Oregon Prescription Drug Monitoring Program (www.orpdmp.com) and has the prescriber evaluated the PDMP at least once in the past 3 months for this patient?	**Yes:** Go to #6	**No:** Pass to RPh. Deny; not funded by the OHP.
6. Is the request for continuation of therapy previously approved by the FFS program?	**Yes:** Go to **Renewal Criteria**	**No:** Go to #7
7. Is the request for treatment of post-traumatic stress disorder (PTSD)? Note: Risks of benzodiazepine treatment outweigh benefits for patients with PTSD. Treatment with benzodiazepines is not recommended.	**Yes:** Pass to RPh. Deny; medical appropriateness.	**No:** Go to #8
8. Is the request for treatment of anxiety or panic disorder?	**Yes:** Go to #9	**No:** Go to #10
9. Is the medication prescribed by or in consultation with a psychiatrist OR does the patient have a documented trial and failure, contraindication, intolerance, or inability to access recommended first-line treatment options including antidepressants AND psychotherapy (e.g. behavioral therapy, relaxation response training, mindfulness meditation training, eye movement desensitization and reprocessing)? Note: An adequate trial to determine efficacy of an SSRI or SNRI is 4-6 weeks.	**Yes:** Go to #12 Document trial, contraindication, or intolerance to treatment options.	**No:** Pass to RPh; Deny; medical appropriateness. Recommend adequate trial of first-line therapies. If provider requests short-term approval with a plan to start additional therapy, approval may be granted for up to 3 months. Subsequent requests must document experience with first-line treatment options.

Approval Criteria		
10. Is the request for treatment of psychosis, schizophrenia or schizoaffective disorder?	**Yes:** Go to #11	**No:** Go to #12
11. Is the medication prescribed by or in consultation with a psychiatrist OR does the patient have an adequate trial and failure, contraindication, intolerance, or inability to access recommended first-line treatment options including second-generation antipsychotics AND psychotherapy (e.g. counseling, cognitive behavioral therapy, social skills training, or psychoeducation)? Note: For continued symptoms, assess adherence and dose optimization. For patients on an adequate dose of antipsychotic, guidelines recommend trial of a second antipsychotic or augmentation with a mood stabilizer.	**Yes:** Go to #12 Document trial, contraindication, or intolerance to treatment options.	**No:** Pass to RPh; Deny; medical appropriateness. Recommend adequate trial of first-line therapies. If provider requests short-term approval with a plan to start additional therapy, approval may be granted for up to 3 months. Subsequent requests must document experience with first-line treatment options.
12. Is the patient on a concurrent sedative, hypnotic, muscle relaxant, or opioid?	**Yes:** Pass to RPh. Deny; medical appropriateness.	**No:** Go to #13
13. RPh only: Is there appropriate rationale to support long-term benzodiazepine use for this indication? For anxiety, panic disorder, or schizophrenia, provider rationale should include information from relevant chart notes. For other diagnoses, provider must document supporting medical literature.	**Yes:** Approve for up to 6 months.	**No:** Deny; medical appropriateness.

Renewal Criteria		
1. Is the request for a decrease in daily dose OR a change in drug with the intent to taper the dose?	**Yes:** Approve for up to 6 months or length of taper, whichever is less.	**No:** Go to #2
2. Is the request for an increase in dose?	**Yes:** Go to #3	**No:** Go to #4
3. Has the patient failed all clinically appropriate first-line adjunct treatment options OR, when applicable, is the patient adherent to recommended first-line treatment options for their condition?	**Yes:** Go to #4	**No:** Pass to RPh; Deny; medical appropriateness. Recommend trial of alternative therapies. If provider requests short-term approval with a plan to start additional therapy, approval may be granted for up to 3 months. Subsequent requests must document experience with first-line treatment options.
4. Is there documentation based on medical records that provider and patient have discussed whether benefits of long-term therapy (e.g. symptom improvement, social function, number of hospitalizations, etc) continue to outweigh risks of therapy (e.g. sedation, dependence, cognitive dysfunction and/or psychiatric instability)?	**Yes:** Approve for up to 12 months.	**No:** Pass to RPh; Deny; medical appropriateness. Recommend trial of gradual taper plan. Approval may be granted for up to 3 months to allow time to develop a taper plan. Subsequent requests must document progress toward taper.

Appendix 2:

Table A1. Benzodiazepines codes, PDL, and carve-out status

HSN	GSN	Drug Strength	Generic	PDL	Carveout
001617	003773	0.25 mg	ALPRAZOLAM		Y
001617	058847	0.25 mg	ALPRAZOLAM		Y
001617	003774	0.5 mg	ALPRAZOLAM		Y
001617	050399	0.5 mg	ALPRAZOLAM		Y
001617	058848	0.5 mg	ALPRAZOLAM		Y
001617	003775	1 mg	ALPRAZOLAM		Y
001617	050400	1 mg	ALPRAZOLAM		Y
001617	058849	1 mg	ALPRAZOLAM		Y
001617	021523	1 mg/mL	ALPRAZOLAM		Y
001617	015566	2 mg	ALPRAZOLAM		Y
001617	050401	2 mg	ALPRAZOLAM		Y
001617	058850	2 mg	ALPRAZOLAM		Y
001617	052143	3 mg	ALPRAZOLAM		Y
001656	046191	12.5 mg-5 mg	AMITRIPTYLINE/CHLORDIAZEPOXIDE		Y
001656	046192	25 mg-10 mg	AMITRIPTYLINE/CHLORDIAZEPOXIDE		Y
001611	003739	25 mg	CHLORDIAZEPOXIDE		Y
001610	003734	10 mg	CHLORDIAZEPOXIDE HCL		Y
001610	003735	25 mg	CHLORDIAZEPOXIDE HCL		Y
001610	003736	5 mg	CHLORDIAZEPOXIDE HCL		Y
002037	004902	5 mg-2.5 mg	CHLORDIAZEPOXIDE/CLIDINIUM BR		
001894	051983	0.125 mg	CLONAZEPAM	N	
001894	051984	0.25 mg	CLONAZEPAM	N	
001894	004560	0.5 mg	CLONAZEPAM	Y	
001894	051985	0.5 mg	CLONAZEPAM	N	
001894	004561	1 mg	CLONAZEPAM	Y	
001894	051986	1 mg	CLONAZEPAM	N	
001894	004562	2 mg	CLONAZEPAM	Y	
001894	051987	2 mg	CLONAZEPAM	N	
001612	003744	15 mg	CLORAZEPATE DIPOTASSIUM		Y
001612	003745	3.75 mg	CLORAZEPATE DIPOTASSIUM		Y
001612	003746	7.5 mg	CLORAZEPATE DIPOTASSIUM		Y
001615	003766	10 mg	DIAZEPAM		Y
001615	003767	2 mg	DIAZEPAM		Y
001615	003768	5 mg	DIAZEPAM		Y
001615	003764	5 mg/5 mL (1 mg/mL)	DIAZEPAM		Y

001615	068715	5 mg/5 mL (1 mg/mL, 5 mL)	DIAZEPAM	N	Y
001615	003765	5 mg/mL	DIAZEPAM		Y
004846	003757	0.5 mg	LORAZEPAM		Y
004846	003758	1 mg	LORAZEPAM		Y
004846	003759	2 mg	LORAZEPAM		Y
004846	016363	2 mg/mL	LORAZEPAM		Y
001616	003769	10 mg	OXAZEPAM		Y
001616	003770	15 mg	OXAZEPAM		Y
001616	003771	30 mg	OXAZEPAM		Y

Appendix 3. Error codes for denied claims

Error Code	Error Description
2017	RECIPIENT SERVICES COVERED BY HMO PLAN
4002	Non-Covered Drug
576	CLAIM HAS THIRD-PARTY PAYMENT
4999	THIS DRUG IS COVERED BY MEDICARE PART D
2002	RECIPIENT NOT ELIGIBLE FOR HEADER DATE OF SERVICE
513	RECIPIENT NAME AND NUMBER DISAGREE
3343	Questionable TPL amount
643	INVALID OTHER COVERAGE CODE
238	RECIPIENT NAME IS MISSING
2807	MATCH CODE INVALID
2809	DOB IS INVALID
4007	NON-COVERED NDC DUE TO CMS TERMINATION
1016	NON-PARTICIPATING MANUFACTURER
2017	RECIPIENT SERVICES COVERED BY HMO PLAN
221	DAYS SUPPLY MISSING
219	QUANTITY DISPENSED IS MISSING
268	BILLED AMOUNT MISSING
222	DAYS SUPPLY INVALID
2808	DOB IS MISSING

Appendix 4. Medication Codes and Categories

PDL Class	HSN	Subcategory	Generic
Antidepressants	001638	MAOI	ISOCARBOXAZID

Antidepressants	001639	MAOI	PHENELZINE SULFATE
Antidepressants	033510	MAOI	SELEGILINE
Antidepressants	001640	MAOI	TRANYLCYPROMINE SULFATE
Antidepressants	036156	Other	BUPROPION HBR
Antidepressants	001653	Other	BUPROPION HCL
Antidepressants	011505	Other	MIRTAZAPINE
Antidepressants	009612	Other	NEFAZODONE HCL
Antidepressants	001652	Other	TRAZODONE HCL
STC 07	001620	Other	BUSPIRONE HCL
Antidepressants	010321	SSRI/SNRI	CITALOPRAM HYDROBROMIDE
Antidepressants	040202	SSRI/SNRI	DESVENLAFAXINE
Antidepressants	040692	SSRI/SNRI	DESVENLAFAXINE FUMARATE
Antidepressants	035420	SSRI/SNRI	DESVENLAFAXINE SUCCINATE
Antidepressants	026521	SSRI/SNRI	DULOXETINE HCL
Antidepressants	024022	SSRI/SNRI	ESCITALOPRAM OXALATE
Antidepressants	001655	SSRI/SNRI	FLUOXETINE HCL
Antidepressants	006338	SSRI/SNRI	FLUVOXAMINE MALEATE
Antidepressants	040632	SSRI/SNRI	LEVOMILNACIPRAN HCL
Antidepressants	021229	SSRI/SNRI	MILNACIPRAN HCL
Antidepressants	007344	SSRI/SNRI	PAROXETINE HCL
Antidepressants	025796	SSRI/SNRI	PAROXETINE MESYLATE
Antidepressants	006324	SSRI/SNRI	SERTRALINE HCL
Antidepressants	008847	SSRI/SNRI	VENLAFAXINE HCL
Antidepressants	037597	SSRI/SNRI	VILAZODONE HCL
Antidepressants	040637	SSRI/SNRI	VORTIOXETINE HYDROBROMIDE
Antidepressants	001643	TCA	AMITRIPTYLINE HCL
Antidepressants	001648	TCA	AMOXAPINE
Antidepressants	004744	TCA	CLOMIPRAMINE HCL
Antidepressants	001645	TCA	DESIPRAMINE HCL
Antidepressants	001650	TCA	DOXEPIN HCL
Antidepressants	001641	TCA	IMIPRAMINE HCL
Antidepressants	001642	TCA	IMIPRAMINE PAMOATE
Antidepressants	001651	TCA	MAPROTILINE HCL
Antidepressants	001644	TCA	NORTRIPTYLINE HCL
Antidepressants	001646	TCA	PROTRIPTYLINE HCL
Antidepressants	001649	TCA	TRIMIPRAMINE MALEATE
Antipsychotics, 1st Gen			CHLORPROMAZINE HCL
Antipsychotics, 1st Gen			FLUPHENAZINE HCL
Antipsychotics, 1st Gen			HALOPERIDOL
Antipsychotics, 1st Gen			HALOPERIDOL LACTATE

Antipsychotics, 1st Gen		LOXAPINE SUCCINATE
Antipsychotics, 1st Gen		PERPHENAZINE
Antipsychotics, 1st Gen		PIMOZIDE
Antipsychotics, 1st Gen		THIORIDAZINE HCL
Antipsychotics, 1st Gen		THIOTHIXENE
Antipsychotics, 1st Gen		THIOTHIXENE HCL
Antipsychotics, 1st Gen		TRIFLUOPERAZINE HCL
Antipsychotics, 2nd Gen		ARIPIPRAZOLE
Antipsychotics, 2nd Gen		ASENAPINE MALEATE
Antipsychotics, 2nd Gen		BREXPIPRAZOLE
Antipsychotics, 2nd Gen		CARIPRAZINE HCL
Antipsychotics, 2nd Gen		CLOZAPINE
Antipsychotics, 2nd Gen		LURASIDONE HCL
Antipsychotics, 2nd Gen		OLANZAPINE
Antipsychotics, 2nd Gen		PALIPERIDONE
Antipsychotics, 2nd Gen		PIMAVANSERIN TARTRATE
Antipsychotics, 2nd Gen		QUETIAPINE FUMARATE
Antipsychotics, 2nd Gen		RISPERIDONE
Antipsychotics, 2nd Gen		ZIPRASIDONE HCL
Antipsychotics, Parenteral	024551	ARIPIPRAZOLE
Antipsychotics, Parenteral	042595	ARIPIPRAZOLE LAUROXIL
Antipsychotics, Parenteral	001621	CHLORPROMAZINE HCL
Antipsychotics, Parenteral	001624	FLUPHENAZINE DECANOATE
Antipsychotics, Parenteral	001626	FLUPHENAZINE HCL
Antipsychotics, Parenteral	001660	HALOPERIDOL DECANOATE
Antipsychotics, Parenteral	001661	HALOPERIDOL LACTATE
Antipsychotics, Parenteral	011814	OLANZAPINE
Antipsychotics, Parenteral	036716	OLANZAPINE PAMOATE
Antipsychotics, Parenteral	036479	PALIPERIDONE PALMITATE
Antipsychotics, Parenteral	025509	RISPERIDONE MICROSPHERES
Antipsychotics, Parenteral	001630	TRIFLUOPERAZINE HCL
Antipsychotics, Parenteral	023379	ZIPRASIDONE MESYLATE
Muscle Relaxants, Oral		BACLOFEN
Muscle Relaxants, Oral		CARISOPRODOL
Muscle Relaxants, Oral		CARISOPRODOL/ASPIRIN
Muscle Relaxants, Oral		CARISOPRODOL/ASPIRIN/CODEINE
Muscle Relaxants, Oral		CHLORZOXAZONE
Muscle Relaxants, Oral		CYCLOBENZAPRINE HCL
Muscle Relaxants, Oral		DANTROLENE SODIUM
Muscle Relaxants, Oral		METAXALONE

Muscle Relaxants, Oral	METHOCARBAMOL
Muscle Relaxants, Oral	METHOCARBAMOL/ASPIRIN
Muscle Relaxants, Oral	ORPHENADRINE CITRATE
Muscle Relaxants, Oral	ORPHENADRINE/ASPIRIN/CAFFEINE
Muscle Relaxants, Oral	TIZANIDINE HCL
Opioids, Long-Acting	BUPRENORPHINE
Opioids, Long-Acting	BUPRENORPHINE HCL
Opioids, Long-Acting	FENTANYL
Opioids, Long-Acting	HYDROCODONE BITARTRATE
Opioids, Long-Acting	HYDROMORPHONE HCL
Opioids, Long-Acting	LEVORPHANOL TARTRATE
Opioids, Long-Acting	METHADONE HCL
Opioids, Long-Acting	MORPHINE SULFATE
Opioids, Long-Acting	MORPHINE SULFATE/NALTREXONE
Opioids, Long-Acting	OXYCODONE HCL
Opioids, Long-Acting	OXYCODONE MYRISTATE
Opioids, Long-Acting	OXYMORPHONE HCL
Opioids, Long-Acting	TAPENTADOL HCL
Opioids, Long-Acting	TRAMADOL HCL
Opioids, Short-Acting	ACETAMINOPHEN WITH CODEINE
Opioids, Short-Acting	ACETAMINOPHEN/CAFF/DIHYDROCOD
Opioids, Short-Acting	ASPIRIN/CAFFEIN/DIHYDROCODEINE
Opioids, Short-Acting	ASPIRIN/CAFFEINE/DIHYDROCODEIN
Opioids, Short-Acting	ASPIRIN/CODEINE PHOSPHATE
Opioids, Short-Acting	BUTALBIT/ACETAMIN/CAFF/CODEINE
Opioids, Short-Acting	BUTORPHANOL TARTRATE
Opioids, Short-Acting	COD/ASA/SALICYLMD/ACETAMIN/CAF
Opioids, Short-Acting	CODEINE SULFATE
Opioids, Short-Acting	CODEINE/BUTALBITAL/ASA/CAFFEIN
Opioids, Short-Acting	FENTANYL
Opioids, Short-Acting	FENTANYL CITRATE
Opioids, Short-Acting	HYDROCODONE BITARTRATE/ASPIRIN
Opioids, Short-Acting	HYDROCODONE/ACETAMINOPHEN
Opioids, Short-Acting	HYDROCODONE/IBUPROFEN
Opioids, Short-Acting	HYDROMORPHONE HCL
Opioids, Short-Acting	IBUPROFEN/OXYCODONE HCL
Opioids, Short-Acting	MEPERIDINE HCL
Opioids, Short-Acting	MEPERIDINE HCL/PROMETH HCL
Opioids, Short-Acting	MORPHINE SULFATE
Opioids, Short-Acting	OPIUM/BELLADONNA ALKALOIDS

Opioids, Short-Acting	OXYCODONE HCL
Opioids, Short-Acting	OXYCODONE HCL/ACETAMINOPHEN
Opioids, Short-Acting	OXYCODONE HCL/ASPIRIN
Opioids, Short-Acting	OXYMORPHONE HCL
Opioids, Short-Acting	PENTAZOCINE HCL/NALOXONE HCL
Opioids, Short-Acting	PROPOXYPHENE HCL
Opioids, Short-Acting	PROPOXYPHENE HCL/ACETAMINOPHEN
Opioids, Short-Acting	PROPOXYPHENE NAP/ACETAMINOPHEN
Opioids, Short-Acting	PROPOXYPHENE/ASPIRIN/CAFFEINE
Opioids, Short-Acting	TAPENTADOL HCL
Opioids, Short-Acting	TRAMADOL HCL
Opioids, Short-Acting	TRAMADOL HCL/ACETAMINOPHEN
Sedatives	CHLORAL HYDRATE
Sedatives	DIPHENHYDRAMINE HCL
Sedatives	DOXEPIN HCL
Sedatives	DOXYLAMINE SUCCINATE
Sedatives	ESTAZOLAM
Sedatives	ESZOPICLONE
Sedatives	FLURAZEPAM HCL
Sedatives	MIDAZOLAM HCL
Sedatives	QUAZEPAM
Sedatives	RAMELTEON
Sedatives	SUVOREXANT
Sedatives	TASIMELTEON
Sedatives	TEMAZEPAM
Sedatives	TRIAZOLAM
Sedatives	ZALEPLON
Sedatives	ZOLPIDEM TARTRATE

Appendix 5. ICD-10 Diagnosis codes

Funded Category	ICD-10
Epilepsy	G40.001-G40.919
Epilepsy	R56.00-R56.9
Epilepsy	G93.81
Epilepsy	G83.8
Epilepsy	P90
Malignant Neoplasm or other end of life diagnosis	C00.0-C96.9
Malignant Neoplasm or other end of life diagnosis	Z51.5
Anxiety disorders	F40.10-F40.11
Anxiety disorders	F40.210-F40.9

Anxiety disorders	F41.1-F41.9
Panic disorder	F40.00-F40.02
Panic disorder	F41.0
Schizophrenic disorders	F20.0-F20.5
Schizophrenic disorders	F20.81-F20.9
Schizophrenic disorders	F25.0-F25.9
Schizophrenic disorders	F21
Depression or other mood disorder	F32.0-F33.9
Depression or other mood disorder	F34.0
Depression or other mood disorder	F34.1
Depression or other mood disorder	F34.81-F34.89
Depression or other mood disorder	F39
Depression or other mood disorder	N94.3
PTSD or acute stress disorder	F43.0-F43.12
PTSD or acute stress disorder	R45.7
Bipolar disorder	F31.0-F31.9
Bipolar disorder	F30.10-F30.9
Substance Abuse	F10.10-F10.11
Substance Abuse	F10.20-F10.21
Substance Abuse	F11.10-F11.11
Substance Abuse	F11.20-F11.21
Substance Abuse	F12.10-F12.11
Substance Abuse	F12.20-F12.21
Substance Abuse	F13.10-F13.11
Substance Abuse	F13.20-F13.21
Substance Abuse	F14.10-F14.11
Substance Abuse	F14.20-F14.21
Substance Abuse	F15.10-F15.11
Substance Abuse	F15.20-F15.21
Substance Abuse	F16.10-F16.11
Substance Abuse	F16.20-F16.21
Substance Abuse	F18.10-F18.11
Substance Abuse	F18.20-F18.21
Substance Abuse	F19.10-F19.11
Substance Abuse	F19.20-F19.21
Substance Abuse	Z71.51
<u>Unfunded Diagnoses by Category</u>	
Insomnia	F10.182
Insomnia	F10.282
Insomnia	F10.982

Insomnia	F11.182
Insomnia	F11.282
Insomnia	F11.982
Insomnia	F13.182
Insomnia	F13.282
Insomnia	F13.982
Insomnia	F14.182
Insomnia	F14.282
Insomnia	F14.982
Insomnia	F15.182
Insomnia	F15.282
Insomnia	F15.982
Insomnia	F19.182
Insomnia	F19.282
Insomnia	F19.982
Insomnia	F51.01-F51.9
Insomnia	G25.70-G25.81
Insomnia	G25.89
Insomnia	G26
Insomnia	G47.00-G47.29
Insomnia	G47.32
Insomnia	G47.50-G47.51
Insomnia	G47.53-G47.9
Fibromyalgia and chronic pain	M79.7
Fibromyalgia and chronic pain	G89.21
Fibromyalgia and chronic pain	G89.28-G89.29
Back and spine conditions	F45.42
Back and spine conditions	G83.4
Back and spine conditions	G95.0
Back and spine conditions	M24.08
Back and spine conditions	M25.78
Back and spine conditions	M40.00-M40.15
Back and spine conditions	M40.202-M40.57
Back and spine conditions	M42.00-M42.09
Back and spine conditions	M42.11-M42.9
Back and spine conditions	M43.00-M43.4
Back and spine conditions	M43.5X2-M43.5X9
Back and spine conditions	M43.8X1-M43.9
Back and spine conditions	M45.0-M45.9
Back and spine conditions	M46.1

Back and spine conditions	M46.40-M46.99
Back and spine conditions	M47.011-M47.9
Back and spine conditions	M48.00-M48.05
Back and spine conditions	M48.061-M48.38
Back and spine conditions	M48.8X1-M48.9
Back and spine conditions	M49.80-M49.89
Back and spine conditions	M50.00-M50.01
Back and spine conditions	M50.020-M50.93
Back and spine conditions	M51.04-M51.9
Back and spine conditions	M53.2X1-M53.9
Back and spine conditions	M54.00-M54.9
Back and spine conditions	M62.830
Back and spine conditions	M96.1-M96.4
Back and spine conditions	M99.00-M99.09
Back and spine conditions	M99.20-M99.79
Back and spine conditions	M99.81-M99.84
Back and spine conditions	Q06.0-Q06.3
Back and spine conditions	Q06.8-Q06.9
Back and spine conditions	Q68.0
Back and spine conditions	Q76.0-Q76.2
Back and spine conditions	Q76.411-Q76.49
Back and spine conditions	S13.0XXA-S13.0XXD
Back and spine conditions	S13.4XXA-S13.4XXD
Back and spine conditions	S13.8XXA-S13.8XXD
Back and spine conditions	S13.9XXA-S13.9XXD
Back and spine conditions	S16.1XXA-S16.1XXD
Back and spine conditions	S23.0XXA-S23.0XXD
Back and spine conditions	S23.100A-S23.100D
Back and spine conditions	S23.101A-S23.101D
Back and spine conditions	S23.110A-S23.110D
Back and spine conditions	S23.111A-S23.111D
Back and spine conditions	S23.120A-S23.120D
Back and spine conditions	S23.121A-S23.121D
Back and spine conditions	S23.122A-S23.122D
Back and spine conditions	S23.123A-S23.123D
Back and spine conditions	S23.130A-S23.130D
Back and spine conditions	S23.131A-S23.131D
Back and spine conditions	S23.132A-S23.132D
Back and spine conditions	S23.133A-S23.133D
Back and spine conditions	S23.140A-S23.140D

Back and spine conditions	S23.141A-S23.141D
Back and spine conditions	S23.142A-S23.142D
Back and spine conditions	S23.143A-S23.143D
Back and spine conditions	S23.150A-S23.150D
Back and spine conditions	S23.151A-S23.151D
Back and spine conditions	S23.152A-S23.152D
Back and spine conditions	S23.153A-S23.153D
Back and spine conditions	S23.160A-S23.160D
Back and spine conditions	S23.161A-S23.161D
Back and spine conditions	S23.162A-S23.162D
Back and spine conditions	S23.163A-S23.163D
Back and spine conditions	S23.170A-S23.170D
Back and spine conditions	S23.171A-S23.171D
Back and spine conditions	S23.3XXA-S23.3XXD
Back and spine conditions	S23.8XXA-S23.8XXD
Back and spine conditions	S23.9XXA-S23.9XXD
Back and spine conditions	S33.0XXA-S33.0XXD
Back and spine conditions	S33.100A-S33.100D
Back and spine conditions	S33.101A-S33.101D
Back and spine conditions	S33.110A-S33.110D
Back and spine conditions	S33.111A-S33.111D
Back and spine conditions	S33.120A-S33.120D
Back and spine conditions	S33.121A-S33.121D
Back and spine conditions	S33.130A-S33.130D
Back and spine conditions	S33.131A-S33.131D
Back and spine conditions	S33.140A-S33.140D
Back and spine conditions	S33.141A-S33.141D
Back and spine conditions	S33.5XXA-S33.5XXD
Back and spine conditions	S33.8XXA-S33.8XXD
Back and spine conditions	S33.9XXA-S33.9XXD
Back and spine conditions	S34.3XXA-S34.3XXD
Back and spine conditions	S39.092A-S39.092D
Back and spine conditions	S39.82XA-S39.82XD
Back and spine conditions	S39.92XA-S39.92XD
Benzodiazepine poisoning/adverse event	T424X1
Benzodiazepine poisoning/adverse event	T424X1A
Benzodiazepine poisoning/adverse event	T424X1D
Benzodiazepine poisoning/adverse event	T424X1S
Benzodiazepine poisoning/adverse event	T424X2
Benzodiazepine poisoning/adverse event	T424X2A

Benzodiazepine poisoning/adverse event	T424X2D
Benzodiazepine poisoning/adverse event	T424X2S
Benzodiazepine poisoning/adverse event	T424X4
Benzodiazepine poisoning/adverse event	T424X4A
Benzodiazepine poisoning/adverse event	T424X4D
Benzodiazepine poisoning/adverse event	T424X4S
Benzodiazepine poisoning/adverse event	T42.4X5
Benzodiazepine poisoning/adverse event	T42.4X5A
Benzodiazepine poisoning/adverse event	T42.4X5D
Benzodiazepine poisoning/adverse event	T42.4X5S
Benzodiazepine poisoning/adverse event	9694 (ICD-9)
Benzodiazepine poisoning/adverse event	E9394 (ICD-9)
Benzodiazepine poisoning/adverse event	E8532 (ICD-9)
Sedative poisoning, (unintentional, intentional, or undetermined; excludes assault, adverse effects, and underdosing)	T40.0xxx-T40.4xxx, T40.6xxx, T41.41xx-T41.44xx, T42.3xxx-T24.4xxx; T43.0xxx-T43.024x; T48.1xxx; T48.3xxx-T48.5xxx; T48.9xxx; T51.0xxx-T51.2xxx; T51.8xxx-T51.9xxx; T42.6xxx-T42.7xxx (excluding assault diagnoses Txx.xx3x, adverse events Txx.xx5x, and underdosing Txx.xx6x)
Sedative poisoning, accidental poisoning, undeterm pois, (benzodiazepine, barbiturates, other anesthetics, muscle relaxants, cold drugs, respir drugs NEC/NOS, alcohols, heroin, opioids, analgesics, psychotropic, sedatives)	9090, 9091, 9663, 9670, 9689, 9694, 9752, 9754, 9755, 9756, 9758, 9779, 9799, 9800, 9801, 9802, 9808, 9809, 96500, 96501, 96502, 96509, 980, E8501, E850, E8500, E8502, E8508, E8509, E851, E852, E8525, E8528, E8529, E853, E8530, E8531, E8532, E8538, E8539, E8551, E8558, E8559, E8586, E860, E8600, E8601, E8602, E8603, E8608, E8609, E9500, E9800, E9501, E9502, E9800, E9801, E9802, E9804, E9805, E9500, E9501, E9502, E9503, E9504, E9505 (ICD-9)

Appendix 6. Health Outcome Codes

ED Visits	Procedure Codes OR	99281-99285, 99288
	Revenue Center Codes	0450-0459 or 0981
Hospitalizations	Claim Type = I	Claim Type = I
Medical claims for naloxone administration	CPT Code	J2310