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Original Investigation

Prior Authorization and Associated Delays and Denials of Branded Medication Dispensation

Yang Wang, PhD; Joseph F. Levy, PhD; T. Joseph Mattingly II, PharmD, MBA, PhD; Gerard Anderson, PhD

Abstract

IMPORTANCE Prior authorization (PA), a practice used by health insurance companies in the US to control care utilization, may create barriers for treatment delivery. Less is known regarding its impact on delaying and denying prescription medication dispensing.

OBJECTIVE To examine PA processing times and approval rates for branded medication prescriptions that are initially rejected, and to assess key factors associated with variations in these outcomes.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional study used 2024 IQVIA pharmacy claims data to identify branded drug dispensations that faced initial PA rejections and completed the PA adjudication process. The frequencies of same-day processed PA reviews and the final approval rates were calculated. They were then stratified by number of PA reviews, additional rejection reasons, refill status, days of supply, prescribers' ownership, insurance market segment, and patient characteristics. Logistic regressions were performed to estimate the association between these factors and the likelihood of same day processing and final approval. Data were analyzed from July to December 2025.

EXPOSURE Branded medication dispensations after initial PA rejections.

MAIN OUTCOMES AND MEASURES Percentage of same-day processed, and ultimately approved prescription medication dispensations.

RESULTS The analysis included 205 896 branded medication dispensations that faced initial PA rejections from 156 848 patients (mean [SD] age, 55 [14] years; 109 227 females [70%] and 47 621 males [30%]) in the US. Of the total dispensed, 71 324 (35%) prescriptions were processed in 1 day, and the remaining 134 572 (65%) were processed during a median (IQR) of 6 (3-12) days. Of these, 111 758 (54%) were eventually approved. Medication prescriptions with multiple rounds of PA reviews, additional rejection reasons, or refills were associated with 37% (95% CI, 37%-37%), 39% (95% CI, 38%-39%), and 9% (95% CI, 9%-10%) lower probability of same-day processing, respectively. Medication fills from Medicaid patients or patients with multiple disease conditions had 8% (95% CI, 7%-8%) and 5% (95% CI, 4%-5%) lower approval rates, respectively.

CONCLUSIONS AND RELEVANCE This cross-sectional study suggests that most patients filling prescriptions that PA initially rejected experienced treatment delays and/or eventual denials. Claim adjudication complexity, prescription type, and patient characteristics were associated with these outcomes.

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Key Points

Question For branded medication prescriptions that are initially rejected by the prior authorization (PA) review, how many are eventually approved and how much time does the process require?

Findings In this cross-sectional study of 205 896 medication dispensations initially rejected, 35% were processed in 1 day and 54% were eventually approved. Prescriptions with multiple PA reviews, additional rejection reasons, and refills were delayed and patients with Medicaid coverage or multiple disease conditions experienced fewer prescription approvals.

Meaning When filling a branded medication that was initially rejected by PA, most patients experienced treatment delays and/or eventual denials, outcomes that were associated with claim adjudication complexity, prescription type, and patient characteristics.

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

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Introduction

Prior authorization (PA) is a process by which health insurance plans review and approve or deny the delivery of covered health services or medications to beneficiaries. Although the PA process was designed to ensure appropriate clinical practice and to contain health spending by reducing unnecessary or low-value care, it may hinder access to care through unintended consequences, including treatment delays, denial of care, and increased administrative burdens for patients and prescribing clinicians.[1-3] A recent study[1] found that 16% of all insured patients experienced PA-related care delays and/or denials in 2023, with disproportionately higher rates among patients with greater health needs (31%) and those receiving prescription medications (19%). In a large claims analysis conducted from 2016 to 2023, prescription drug denials by private insurers, many of which were related to PA, increased by 25%.[4] The public and policymakers are increasingly scrutinizing how PA affects care access and outcomes, especially for patients requiring more complex and frequent health services.[5,6]

There is an emerging body of research quantifying the prevalence of PA at plan formulary or patient level and assessing its overall impact on curbing care utilization and spending[1,2,7,8]; however, these studies analyzed PA as a binary event (requiring PA review or not). Less is known regarding the intricacies of the PA process itself, especially for branded drugs, which are subject to more frequent PA reviews.[9] However, patients need to know their chances of treatment delays or denials when facing access frictions for medication dispensing due to PA reviews. Therefore, leveraging national pharmacy claims data with claim adjudication details, this study identified PA process at the drug prescription dispensing event level, and quantified the level and variation in PA processing time and final adjudication outcomes for branded medications encountering initial PA rejections. It further examined key factors associated with variation in these outcomes, including claim adjudication details, prescription and prescriber characteristics, insurance payer dynamics, and patient characteristics.

Methods

This cross-sectional study was exempted from institutional review board by the Johns Hopkins Bloomberg School of Public Health because it did not constitute human participants research, in accordance with 45 CFR §46; informed consent was duly waived. We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Data Collection and Study Sample

Our main data source was the 2024 IQVIA Formulary Impact Analyzer outpatient pharmacy claims data. The IQVIA data provides a national sample of retail pharmacies, providing an all-payer claim database with detailed claim adjudication, including complete life cycle processing (rejected, reversed, or paid medication claims).[10-12] It also includes rejection reasons, per the US National Council for Prescription Drug Programs (NCPDP) standard. The IQVIA Formulary Impact Analyzer includes approximately 58% of national retail pharmacy transactions. Our study sample comprised a 10% random person sample of the complete dataset. We focused on branded medications, identified at the molecule level and for which no generic equivalent existed. To standardize our measure of drug claims, we identified a prescription fill (dispensation) transaction (PFT) for each unique combination of patient, prescribing clinician, drug molecule, prescription written date, and number of dispensing events. We ranked PFTs with multiple claim lines by service dates in ascending order. We excluded PFTs if there were multiple plans within a transaction (eg, those switching plans or using cash pay before a transaction was finalized). The IQVIA claim data identified whether each claim line was a finalized transaction. Therefore, we focused on PFTs where the latest claim line was a finalized transaction and all previous claim lines, if any, were not finalized. To capture PA rejections (including initial rejections that were resolved at the end of the PFTs), we focused on PFTs covered by plan

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formularies but had at least 1 claim line with a PA-related reject code specified under the NCPDP standard, a method used in prior research (eTable 2 in Supplement 1).[3,13] We further excluded potential data anomalies: PFTs for prescriptions of more than 365-days' supply and any prescriptions written after or more than 365 days before the last date of service. Detailed sample selection is available in eTable 1 in Supplement 1.

Statistical Analysis

For each PFT, we calculated PA processing time as the difference in days between the first date when a patient tried to fill a prescription (first day for each PFT) and the date when the claim transaction was finalized (last day for each PFT). We determined each PFT's final approval outcomes using the approval status of the finalized claim line either paid, reversed (approved by payers but not picked up by patients), or rejected. Specifically, we identified a PFT as approved if it was paid or reversed and denied if it was rejected. We summarized claim processing time and adjudication outcomes by calculating the prevalence of same day adjudicated PFTs, distribution of processing time for those taking multiple days, and percentage of PFTs that were eventually approved.

We further examined various claim-, prescription-, clinician-, payer-, and patient-level factors that may be associated with variation in PA processing time and final approval status. We first assessed whether the prevalence of same-day processed PFTs and prevalence of approved PFTs differed by claim adjudication complexities, including having 1 or multiple rounds of PA reviews (identified by 1 or multiple claim lines with PA-related NCPDP rejection codes), and the existence of additional formulary-related claim rejection reasons within each PFT. Next, we assessed whether these 2 outcomes differed by prescription settings, including refill status (first fill vs refill), days of supply (≤30 or >30 days), and prescribing clinician's ownership status (independent practice or affiliated with or owned by a corporate entity), assuming such affiliation may assist in navigating PA requirements. This affiliation status was obtained by merging with the 2021 IQVIA OneKey data, a national census of clinicians with individual and practice information.[14-16] Then, we examined payer characteristics associated with outcome variation, including insurance market segments (Medicare, Medicaid, and commercial plans) and if the associated pharmacy benefit manager (PBM) was a major PBM entity (eg, Express Scripts, CVS Caremark, and Optum Rx). Altogether, these 3 PBMs comprised 79% of the market share in 2022.[17] Moreover, we assessed outcome variation by patient characteristics, including age, sex, rural or urban location, and number of disease conditions per patient—determined by counting the number of drug classes used per each patient's claim utilization records in 2024.[18]

To further quantify the adjusted associations between these factors and the prevalence of same-day processed PFTs and prevalence of approved PFTs, we estimated 2 separate logistic models, 1 for each outcome measure. All of the 11 factors identified were included as explanatory variables for both models. In addition, we included molecule-level fixed effects to control for individual drug molecules that may affect our outcome measures. Then, we used marginal effect prediction to calculate the probability of same-day processing and the probability of final approval associated with each explanatory variable.[12]

For sensitivity analysis, we performed Poisson regression as an alternative modeling. Moreover, we ran subgroup analyses by excluding PFTs with reversed claim status, limiting our sample on glucagon-like peptide-1 (GLP-1) agonists given their rapid rise in utilization and spending, and focusing on PFTs that experienced multiple days of PA review, where outcome was 1 if more than 14 days, and 0 otherwise. Two-sided *t* tests were used to compare means, with significance level defined as $P < .05$). Data analyses were performed from July to December 2025, using STATA, version 17 (StataCorp LLC).

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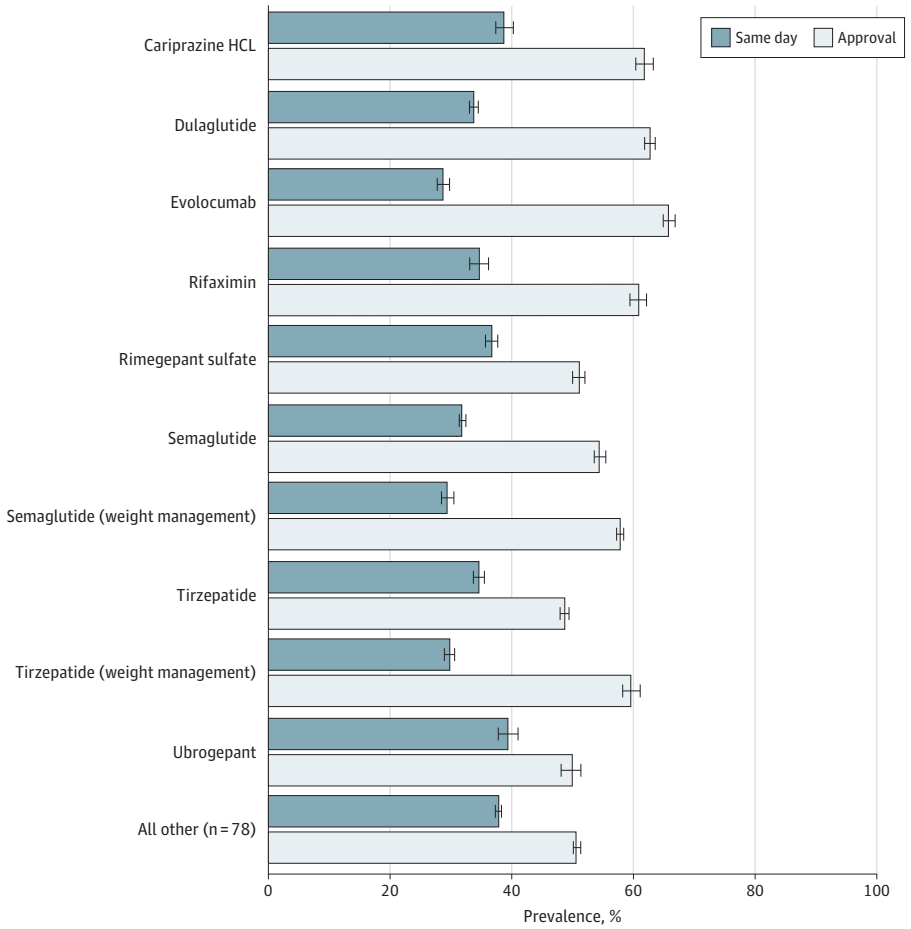
Results

The analysis included 205 896 finalized PFTs that faced initial PA rejections and had completed the entire claim adjudication process, which accounted for 3% of the 7 106 194 total branded PFTs (eTable 1 in Supplement 1). The sample was constructed from 731 237 individual claim lines, corresponding to 156 848 patients, 104 501 prescribing clinicians, and 88 drug molecules across the 50 US states and the District of Columbia. Of the 205 896 PFTs transacted, 71 324 (35%) were processed in 1 day. For those processed in multiple days (134 572 [65%]), distribution was right skewed with a median (IQR) of 6 (3-12) days (eFigure in Supplement 1). Of the total, 111 758 (54%) PFTs were ultimately approved, including 100 404 (49%) paid claims and 11 354 (6%) reversed claims. More specifically, 15 327 PFTs (7%) were approved in the same day when patients first tried to fill their prescriptions, and 96 431 (47%) were approved in multiple days. Of rejected claims, 55 997 (27%) were rejected within 1 day (same day) and 38 141 (19%) were rejected after multiple days.

Figure 1 shows the prevalence of same-day adjudicated PFTs and approval rates for the top 10 most popular drugs from 140 952 prescription dispensations, 5 of which were for GLP-1 agonists, including dulaglutide, semaglutide, tirzepatide, semaglutide for weight management, and tirzepatide for weight management. Overall, same-day adjudication was most common for ubrogepant (40%) and least common for evolocumab (29%). Approval rates were highest for evolocumab (66%) and

Figure 1. Bar Graph of Same-Day Process and Approval Rates for Prescription Dispensing Transactions With Initial Rejection From Prior Authorization, by Drug Molecules



HCL indicates hydrochloride salt.

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lowest for tirzepatide (49%). Of the remaining 64 944 PFTs for the other 78 drugs, 38% were processed in the same day and 51% of these were approved.

The **Table** presents the mean percentage of same-day processed PFT and percentage of ultimately approved PFT stratified by various factors. Compared to PFTs that were subject to only 1 PA review, those encountering multiple rounds of PA reviews (121 826 [59%] of total sample) were less likely to be processed in the same day (mean [SD], 16% [0.001] vs 62% [0.0014]). PFTs with additional rejection reasons (22 819 [11%]) were less likely to be processed in same day (mean [SD], 7% [0.0017] vs 38% [0.0011]) but more likely to be approved (mean [SD], 70% [0.003] vs 52% [0.0012]). The most common reasons included step therapy, refill requested to soon, and exceeding maximum benefit. Refills (34 877 [17%]) had higher approval rates (mean [SD], 72% [0.0024] vs 51% [0.0012] for first fills), whereas medications with >30 days' supply (34 650 [17%]) had lower

Table. Prevalence of Same-Day Processing and Approval Rates for Prescription Dispensing Transactions With Initial Rejection From Prior Authorization (PA), by Claim-, Prescription-, Payer-, and Patient-Level Factors

Factor	Transactions, No. (%)	Mean prevalence, % (SD)	
		Same-day processing	Approved
Total sample	205 896 (100)	35 (0.0009)	54 (0.0001)
PA reviews, No.			
1	84 070 (41)	62 (0.0017)	55 (0.0017)
Multiple	121 826 (59)	16 (0.001)	54 (0.0014)
Additional rejection reasons			
No	183 077 (89)	38 (0.0011)	52 (0.0012)
Yes	22 819 (11)	7 (0.0017)	70 (0.003)
Refill			
No	171 019 (83)	37 (0.0012)	51 (0.0012)
Yes	34 877 (17)	24 (0.0023)	72 (0.0024)
Days of supply, d			
≤30	171 246 (83)	35 (0.0012)	55 (0.0012)
>30	34 650 (17)	34 (0.0025)	50 (0.0027)
Prescribing clinician's pharmacy ownership			
Independent	84 307 (41)	37 (0.0017)	52 (0.0017)
Corporate	121 589 (59)	33 (0.0013)	56 (0.0014)
Health insurance market segments			
Medicare	54 348 (26)	34 (0.002)	60 (0.0021)
Medicaid	75 366 (37)	38 (0.0018)	48 (0.0018)
Commercial	76 182 (37)	32 (0.0017)	56 (0.0018)
Major pharmacy benefit manager			
No	77 852 (38)	37 (0.0017)	52 (0.0018)
Yes	128 044 (62)	33 (0.0013)	56 (0.0014)
Patient age group, y			
<18	1688 (1)	37 (0.0117)	54 (0.0121)
18-44	43 034 (21)	35 (0.0023)	52 (0.0024)
45-64	115 409 (56)	35 (0.0014)	53 (0.0015)
≥65	45 765 (22)	34 (0.0022)	59 (0.0023)
Patient sex			
Female	144 826 (70)	35 (0.0012)	53 (0.0013)
Male	61 070 (30)	35 (0.0019)	56 (0.002)
Patient with multiple conditions			
No	116 407 (57)	33 (0.0014)	57 (0.0015)
Yes	89 489 (43)	36 (0.0016)	51 (0.0017)
Geographic location			
Rural	42 213 (21)	36 (0.0023)	54 (0.0024)
Urban	163 683 (79)	34 (0.0012)	54 (0.0012)

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approval rates (mean [SD], 50% [0.0027] vs 55% [0.0012] <30 days). Compared to independent prescribing clinicians, those having corporate affiliation (121 589 [59%]) had higher approval rates (mean [SD], 56% [0.0014] vs 52% [0.0017]). Across health insurance programs, Medicaid had the highest same-day adjudication rates (mean [SD], 38% [0.0018]; 34% [0.002] for Medicare; 32% [0.0017] for commercial plans), but the lowest approval rates (mean [SD], 48% [0.0018]; 60% [0.0021] for Medicare; 56% [0.0018] for commercial plans). Female patients (144 826 [70%]) had lower approval rates (mean [SD], 53% [0.0013] vs 56% [0.002] for male patients). Patients with multiple disease conditions (89 489 [43%]) had lower approval rates (mean [SD], 51% [0.0017] vs 57% [0.0015] for those with only 1 condition).

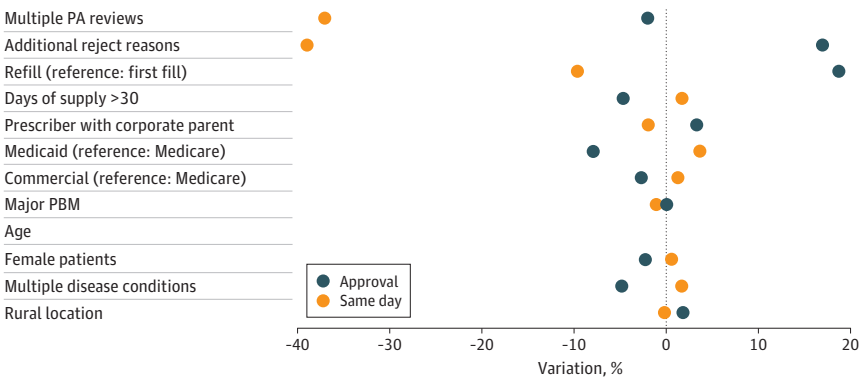
Marginal effect predictions based on logistic regression modeling found similar results (**Figure 2**; eTable 3 in Supplement 1). Specifically, PFTs with multiple rounds of PA reviews were associated with a 37% (95% CI, 37%-37%) lower probability of same day adjudication and 2% (95% CI, 1%-2%) lower probability of approval. PFTs with additional rejection reasons and refills had a 39% (95% CI, 38%-39%) and a 9% (95% CI, 9%-10%) lower probability of same-day adjudication, respectively. However, they had 17% (95% CI, 17%-18%) and 19% (95% CI, 18%-20%) higher probability of being eventually approved, respectively. PFTs with days of supply exceeding 30 days had a 4% (95% CI, 4%-5%) lower approval rate. Prescriptions written by clinicians whose practice had a corporate affiliation had a 3% (95% CI, 3%-4%) higher approval rate compared to those practicing independently.

Compared to PFTs billed through the Medicare program, those paid by Medicaid and commercial plans had a 4% (95% CI, 3%-4%) and a 1% (95% CI, 1%-2%) higher chance of same-day process, while 8% (95% CI, 7%-8%) and 3% (95% CI, 2%-3%) lower approval rates, respectively. We did not observe statistically significant or economically meaningful estimates associated with major PBM status, patient age, or rural-urban location. Female patients and patients with multiple disease conditions had a 2% (95% CI, 2%-3%) and a 5% (95% CI, 4%-5%) lower approval rate, respectively. Poisson regression found similar result estimates (eTable 4 in Supplement 1). The subgroup analyses—excluding reversed PFTs, restricting to GLP-1 agonists only, or limiting on PFTs with multiple day process—all produced results consistent with the primary model (eTables 5, 6, and 7 in Supplement 1).

Discussion

Prior literature has often studied PA as a binary event based on drug formularies (eg, is it covered, and does it require PA review or not).[1,2,7,8] To our knowledge, this is the first study that developed a granular and systematic identification of PA rejections at the prescription fill level. Of prescriptions initially rejected by PA, 11% were resolved and approved on the same day as the patient's first drug fill

Figure 2. Dot Graph of Factors Associated With Variation in Percentage of Same-Day Processing and Approval Rates for Prescription Fill Transactions With Initial Rejection From Prior Authorization (PA)



Marginal effect predictions are measured in probability and converted from the logistic regression estimates (odds ratio). Drug molecule fixed effects are included. Error bars indicate 95% CIs. PBM indicates pharmacy benefits manager.

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attempt. This implied minimum friction in treatment access, which may be partially contributed by the growing adoption of algorithms and artificial intelligence technology for real-time claim adjudication.[19,20] However, 44% PFTs were approved after a median of 6 days of PA review, and 45% PFTs were eventually denied. This empirical evidence demonstrated the frequent treatment delays and denials caused by PA, adding to a growing body of literature on the impact of PA on curbing treatment access.[2,7,8] Note that our sample represented PFTs that faced initial PA rejections and completed the entire PA process, which enabled us to systemically measure the processing time and final adjudication outcomes. However, this was not a comprehensive count of drug PA reviews, which should further include PFTs with initial PA rejections but not completing the whole process, and PFTs subject to PA reviews by plan formularies but were immediately approved before the first prescription fill attempt. That said, consistent with prior literature, our sample still included the widely prescribed branded medications subject to frequent PA reviews due to cost containment efforts or adherence to treatment guidelines established by medical societies.[21-24]

Both our descriptive analysis (Table) and regression output (Figure 1) found several key empirical factors that consistently drove variation in PA processing time and adjudication outcomes. The most notable attributes were claim adjudication complexity and prescription characteristics. Not surprisingly, PFTs with multiple rounds of PA reviews were the most delayed. While these cases may reflect complex treatment decisions that require multiple layers of PA reviews and approval, insurers may consider streamlining the PA review to expedite this process. Interestingly, we found that having additional rejection reasons and refills, while associated with longer processing time, had higher approval rates instead. A prior study[20] found that PA incurred additional financial costs and administrative burden for insurance payers. Therefore, for PA cases with high probability of eventual approval, alleviating PA requirements would not only improve patients' timely access to medications but also reduce insurers' financial cost and increase their administrative efficiency.[25]

Our findings can inform clinicians of prescribing strategies to reduce PA-related treatment delay and denials. For example, we found lower final approval rates among prescriptions with longer days of supply, as well as varying PA processing time and approval rates for different molecules under the same drug class (eg, GLP-1 agonist). Therefore, when clinically appropriate, prescribing drugs with shorter days of supply (eg, more frequent refills) or drug molecules with less frequent and lengthy PA reviews or higher approval rates could be potentially beneficial for patients' timely access to treatment. This shift could also minimize the prescribing clinicians' work and costs if it does not introduce more frequent delays and additional administrative burdens.

Moreover, we found that prescribing clinicians' ownership status also played a role in the dynamics of PA approval. Specifically, those affiliated with larger corporate entities had higher PA approval rates. This may be associated with better access to resources that help clinicians navigate the PA requirements and assist with prescribing decisions, such as advanced data software with patients' formulary information and approval statistics.[26] Moreover, these data and predictive resources may further inform clinicians on how to avoid prescribing drugs that require PA, especially those with lengthy review process and lower approval rates. Avoidance would occur upstream of the pharmacy claim, which is not observed in this study, and which warrants future research.

Finally, patient characteristics also influenced PA approval rates. We found that patients with multiple disease conditions or enrolled in the Medicaid program were more likely to have their medications denied by PA. Our results suggest greater PA-related access frictions at pharmacy counters for patients with greater and more complex health needs and with fewer socioeconomic resources—potential negative implications for treatment outcomes.[1]

Due to the lack of diagnosis information, our analysis could not assess the clinical appropriateness of the PA decision for each individual PFTs. That said, our findings remain valid, as we used national claims data that included a large sample of prescribing clinicians not purposefully selected by their inclination to inappropriately prescribe medications. Our regression also included molecule-level fixed effects to control for individual medications that may be subject to varying degrees of inappropriate prescription or off-label use, which could have influenced our outcome

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estimates. Therefore, our findings offer a valuable and unique perspective in understanding the nuanced mechanism of PA. These findings are informative for patients who do not necessarily possess expertise on the clinical appropriateness of their prescriptions.

Limitations

This study has several limitations. First, our study used administrative data that may be subject to measurement inaccuracies. Specifically, we were unable to incorporate pharmacy characteristics into our analysis due to the lack of pharmacy identifiers in our data. Second, our study focused exclusively on branded prescription drug claims undergoing the PA process in the retail pharmacy setting. Our findings may not be generalizable to other forms of non-PA utilization management, such as not covered, step therapy, exceeding quantity or refill limit, or to generic medications. Third, our analysis was cross-sectional in nature; therefore, findings should be interpreted as associations instead of causal. Fourth, this study did not examine patients' behaviors after PA denial, such as repealing the PA decision, trying to access medications with new prescriptions, different health insurance plans, paying in cash, or filling different drugs in the same therapeutic category. Fifth, we studied patients' prescription filling behaviors after an initially rejected claim line due to PA requirements. However, we did not observe prescriptions that underwent the PA process and were immediately approved before the first dispensation attempt. Future work that combines these data with actual formularies could address this complexity. Sixth, we were unable to capture the effect of PA requirements on clinicians' prescribing behavior. To the extent that PA serves as an administrative burden or introduces friction into the prescribing process, some clinicians may avoid initiating prescriptions for drugs that require PA. This avoidance would occur upstream of the pharmacy claim and, therefore, cannot be observed in our data. Seventh, we could not assess the clinical appropriateness of PA decisions, that is, whether rejected PAs represented inappropriate prescribing or overly restrictive plan requirements. These research gaps represent promising areas for future research.

Conclusions

This cross-sectional study using national pharmacy claims data with adjudication details, found that most branded drug prescriptions that were initially rejected by PA were delayed for multiple days and/or denied. Claim adjudication complexity, prescription type, and patient characteristics were key factors associated with longer delays and more frequent denials. Our findings inform patients and clinicians regarding the dynamics and nuances of the PA process, and support payers in improving the PA process to balance cost containment with timely access to treatment.

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Corresponding Author: Yang Wang, PhD, Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, 1812 Ashland Ave, Baltimore, MD 21205 (ywang406@jhu.edu).

Author Affiliations: Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland (Wang, Levy, Anderson); Department of Pharmacotherapy, University of Utah College of Pharmacy, Salt Lake City (Mattingly); Johns Hopkins School of Medicine, Baltimore, Maryland (Anderson).

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Author Contributions: Drs Wang and Levy had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Wang, Levy.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Wang, Levy.

Critical review of the manuscript for important intellectual content: All authors.

Statistical analysis: Wang, Levy.

Obtained funding: Anderson.

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Supervision: Levy, Mattingly.

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REFERENCES

1. Pollitz K, Pestaina K, Lopes L, Wallace R, Lo J. Consumer Problems with Prior Authorization: Evidence from KFF Survey. Kaiser Family Foundation. September 29, 2023. https://www.kff.org/affordable-care-act/consumer-problems-with-prior-authorization-evidence-from-kff-survey/

2. Brot-Goldberg ZC, Burn S, Layton T, Vabson B. Rationing Medicine Through Bureaucracy: Authorization Restrictions in Medicare. National Bureau of Economic Research. January 2023. https://www.nber.org/papers/w30878

3. Laliberté F, Zanardo E, MacKnight SD, Urosevic A, Wade SW, Parikh M. Impact of formulary-related pharmacy claim rejections of cariprazine on health care utilization and treatment patterns among patients with bipolar I disorder. *J Manag Care Spec Pharm*. 2024;30(2):118-128. doi:10.18553/jmcp.2024.30.2.118

4. Kliff S. Health Insurers Are Denying More Drug Claims, Data Shows. The New York Times. July 18, 2025. https://www.nytimes.com/2025/07/18/health/health-insurance-prescription-claim-denials.html?smid=nytcore-ios-share&referringSource=articleShare

5. Office of Inspector General, US Department of Health and Human Services. Some Medicare Advantage Organization Denials of Prior Authorization Requests Raise Concerns About Beneficiary Access to Medically Necessary Care. April 27, 2022. https://oig.hhs.gov/reports/all/2022/some-medicare-advantageorganization-denials-of-prior-authorization-requests-raise-concernsabout-beneficiary-access-to-medically-necessary-care/

6. Blumenthal R. Senate Permanent Subcommittee on Investigations Releases Majority Staff Report Exposing Medicare Advantage Insurers' Refusal of Care for Vulnerable Seniors Updated October 17, 2024. https://www.blumenthal.senate.gov/newsroom/press/release/senate-permanent-subcommittee-on-investigations-releases-majority-staff-report-exposing-medicare-advantage-insurers-refusal-of-care-for-vulnerable-seniors.

7. Kyle MA, Keating NL. Prior authorization and association with delayed or discontinued prescription fills. *J Clin Oncol*. 2024;42(8):951-960. doi:10.1200/JCO.23.01693

8. Dillender M. What happens when the insurer can say no? Assessing prior authorization as a tool to prevent high-risk prescriptions and to lower costs. *J Public Econ*. 2018;165:170-200. doi:10.1016/j.jpubeco.2018.07.006

9. American Medical Association. 2017 AMA Prior Authorization Physician Survey. 2017. https://www.ama-assn.org/practice-management/prior-authorization/prior-authorization

10. IQVIA. Available IQVIA data. Formulary Impact Analyzer (FIA). https://www.iqvia.com/insights/the-iqvia-institute/available-iqvia-data

11. Kang SY, Sen AP, Levy JF, Long J, Alexander GC, Anderson GF. Factors associated with manufacturer drug coupon use at US pharmacies. *JAMA Health Forum*. 2021;2(8):e212123. doi:10.1001/jamahealthforum.2021.2123

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12. Wang Y, Kang SY, Socal MP, Dusetzina SB. Manufacturer-sponsored drug coupon use and drug-switching behavior among patients with type 2 diabetes. *J Manag Care Spec Pharm*. 2024;30(9):903-907. doi:10.18553/jmcp.2024.30.9.903

13. Medi-Cal Rx Provider Manual. Medi-Cal Rx. October 1, 2025. https://medi-calrx.dhcs.ca.gov/home/provider-manual/

14. IQVIA. OneKey Healthcare Industry Database—Overview. Accessed July 26, 2024. https://www.onekeydata.com/onekey/overview

15. Wang Y, Meiselbach M, Wang X, Bai G, Anderson G. Commercial prices for primary care physician office visits. *J Gen Intern Med*. 2025. doi:10.1007/s11606-025-09798-8

16. Singh Y, Radhakrishnan N, Adler L, Whaley C. Growth of private equity and hospital consolidation in primary care and price implications. *JAMA Health Forum*. 2025;6(1):e244935. doi:10.1001/jamahealthforum.2024.4935

17. Mattingly TJ II, Hyman DA, Bai G. Pharmacy benefit managers: history, business practices, economics, and policy. *JAMA Health Forum*. 2023;4(11):e233804. doi:10.1001/jamahealthforum.2023.3804

18. Farley JF, Harley CR, Devine JW. A comparison of comorbidity measurements to predict healthcare expenditures. *Am J Manag Care*. 2006;12(2):110-119.

19. Marr J. Algorithmic decision-making in health care: Evidence from post-acute care in Medicare Advantage. *J Health Econ*. 2025;104:103055. doi:10.1016/j.jhealeco.2025.103055

20. Leland A, Rodstein M, Erickson A, Lassen D, Gleason P. Impact of a medical claims automated glucagonlike peptide-1 drugs prior authorization program. Poster presented at: AMCP Nexus 2025; October 27-30, 2025; National Harbor, MD. Accessed March 16, 2026. https://amcpnexus2025.eventscribe.net/ajaxcalls/PosterInfo.asp?PosterID=766356

21. Doshi JA, Puckett JT, Parmacek MS, Rader DJ. Prior authorization requirements for proprotein convertase subtilisin/kexin type 9 inhibitors across US private and public payers. *Circ Cardiovasc Qual Outcomes*. 2018;11(1):e003939. doi:10.1161/CIRCOUTCOMES.117.003939

22. Moskatel LS, Slusky DJG. The state of insurance coverage of calcitonin gene-related peptide-targeted medications and its impact on the implementation of the American Headache Society's 2024 consensus statement: An interrupted time-series analysis. *Headache*. 2025. doi:10.1111/head.15027

23. Liu X, Lu CA, Shih YT, Jiang C. Coverage and prior authorization policies for semaglutide and tirzepatide in Medicare part D plans. *JAMA Netw Open*. 2025;8(8):e2529842. doi:10.1001/jamanetworkopen.2025.29842

24. Oregon Prescription Drug Affordability Board. Vraylar (cariprazine/cariprazine HCl). October 2025. https://dfr.oregon.gov/pdab

25. Kushwaha S, Gao X, Dong Y, Fuldeore M, Park T. Analysis on the net costs of administering a prior authorization policy for onabotulinumtoxinA in the chronic migraine population. Poster presented at: AMCP Nexus 2025; October 27-30, 2025; National Harbor, MD. Accessed March 16, 2026. https://amcpnexus2025.eventscribe.net/ajaxcalls/PosterInfo.asp?PosterID=766323

26. Covermymeds. Optimizing Provider Workflows. Accessed November 25, 2025. https://www.covermymeds.health/who-we-serve/provider

SUPPLEMENT 1.

eFigure 1. Histogram of Processing Time for Prescription Fill Transactions with Initial Prior Authorization Rejection
eTable 1. Sample Selection
eTable 2. Prior Authorization Related NCPDP Rejection Code
eTable 3. Factors Associated with Probability of Same Day Process and Approval Rates for Prescription Fill Transactions with Initial Prior Authorization Rejection, Marginal Effect Prediction; Logistics Regression Models
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eTable 7. Factors Associated with Probability of More than Two Weeks Delay among Prescription Fill Transactions Experiencing Multiple Days of Prior Authorization Reviews, Marginal Effect Prediction

SUPPLEMENT 2.

Data Sharing Statement

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