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Brand Medications and Medicare Part D:

How Eye Care Providers' Prescribing Patterns Influence Costs

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Abstract

Purpose—To quantify costs of eye care providers' Medicare Part D prescribing patterns for ophthalmic medications and to estimate the potential savings of generic or therapeutic drug substitutions and price negotiation.

Design—Retrospective cross-sectional study.

Participants—Eye care providers prescribing medications through Medicare Part D in 2013.

Methods—Medicare Part D 2013 prescriber public use file and summary file were used to calculate medication costs by physician specialty and drug. Savings from generic or therapeutic drug substitutions were estimated for brand drugs. The potential savings from price negotiation was estimated using drug prices negotiated by the United States Veterans Administration (USVA).

Main Outcome Measures—Total cost of brand and generic medications prescribed by eye care providers.

Results—Eye care providers accounted for $2.4 billion in total Medicare part D prescription drug costs and generated the highest percentage of brand name medication claims compared with all other providers. Brand medications accounted for a significantly higher proportion of monthly supplies by volume, and therefore, also by total cost for eye care providers compared with all other providers (38% vs. 23% by volume, $P < 0.001$; 79% vs. 56% by total cost, $P < 0.001$). The total cost attributable to eye care providers is driven by glaucoma medications, accounting for $1.2

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billion (54% of total cost; 72% of total volume). The second costliest category, dry eye medications, was attributable mostly to a single medication, Restasis, which has no generic alternative, accounting for $371 million (17% of total cost; 4% of total volume). If generic medications were substituted for brand medications when available, $148 million would be saved (7% savings); if generic and therapeutic substitutions were made, $882 million would be saved (42% savings). If Medicare negotiated the prices for ophthalmic medications at USVA rates, $1.09 billion would be saved (53% savings).

Conclusions—Eye care providers prescribe more brand medications by volume than any other provider group. Efforts to reduce prescription expenditures by eye care providers should focus on increasing the use of generic medications, primarily through therapeutic substitutions. Policy changes enabling Medicare to negotiate prescription drug prices could decrease costs to Medicare.

The United States has the highest health care spending per capita of the 34 high-income democratic countries included in the Organization for Economic Cooperation and Development, but ranks 27th in terms of life expectancy.[1] Prescription drugs are the fastest growing category of health care spending.[2] In 2013, United States citizens spent $265 billion (United States dollars) on retail prescriptions drugs, of which $103 billion was covered by Medicare Part D, the voluntary prescription drug benefit made available to all Medicare beneficiaries under the Medicare Modernization Act of 2003. Medicare Part D plans provide prescription drug coverage to 68% (36 million people) of all Medicare beneficiaries (52 million people) who are 65 years of age and older or those younger than 65 years with permanent disability.[3,4] Prescription drug costs generated by ophthalmologists ranked 12th among providers who prescribed to Medicare Part D beneficiaries, with total costs reaching nearly $2 billion.[5] However, little is known about the prescribing patterns of eye-care providers, which limits policy makers' ability to impact expenditures on ophthalmic drug costs. Using comprehensive payment data for Medicare Part D available from the Centers for Medicare and Medicaid Services,[6] we explored prescribing patterns for eye care providers in detail and estimated the potential cost savings to Medicare from generic and therapeutic drug substitutions or from negotiating drug prices.

Methods

We performed a retrospective, cross-sectional analysis of the 2013 Medicare Part D Prescriber public use file (PUF) and one summary file, both publicly available files, using previously described methods.[5,6] The 2013 data (released in 2015) was the only year available when this study was initiated. In brief, the PUF contains prescription drug event information for each prescriber using the National Provider Identifier and for each unique drug prescribed. After excluding records derived from providers with 10 or fewer claims to maintain beneficiary privacy, 86.8% of claims and 78.1% of total payments are available for analysis. Total costs generated from the detailed PUF therefore are underestimated because of this redacted data to protect patient privacy. The summary file contains information on 99.9% of total claims because it is aggregated by National Provider Identifier and contains no potentially identifying beneficiary-level information. For the purposes of this study, prescribers were considered eye-care providers if the specialty was designated as

ophthalmology or optometry. Drugs were designated as generic if the generic name matched the name recorded for the drug name.

Two board-certified ophthalmologists (P.A.N.-C., M.A.W.) grouped individual medications into 8 disease-specific drug groups: glaucoma, dry eye, ocular inflammation, ocular infection, allergic conjunctivitis, mydriatics, other ophthalmic, and other nonophthalmic (Table S1, available at www.aaojournal.org). Ocular infection medications included topical antibiotic medications and the following oral medications: acyclovir, famciclovir, and valganciclovir as treatment for herpes simplex virus keratitis or herpes zoster virus[7]; moxifloxacin (Avelox), levofloxacin, and ciprofloxacin as treatment for traumatic corneoscleral lacerations[8]; and oral valganciclovir and intravenous ganciclovir as treatment for cytomegalovirus retinitis.[9] Drugs that can be prescribed for multiple indications (e.g., doxycycline for dry eye or as an ophthalmic antibiotic) were assigned a disease-specific group agreed on by the authors. Drug volume prescribed was provided in the PUF as the sum of the days' supply over all claims for each unique drug and provider. The number of 30-day supplies was calculated because claims do not necessarily represent a standard number of days. The PUF and summary file were used to investigate total drug payments in United States dollars, number of prescribers, number of 30-day medication supplies per provider, proportion of generic claims, median drug payment per claim, and median drug payment per 30-day medication supply, and results were stratified by provider specialty, drug class, or generic drug name.

Estimates of cost savings between prescribing generic and brand name medications were calculated as the difference between actual costs and the estimated costs generated when brand medications were substituted with a generic medication when available. Direct substitution meant that the generic and brand medications are made of the same compound (e.g., substituting latanoprost for Xalatan). Estimates of cost savings for using therapeutic substitutions also were calculated. Therapeutic substitutions were used when a direct generic substitution was not available (e.g., Travatan). Therapeutic substitutions meant that a medication in the same therapeutic class was available, but the medication was a different chemical compound (e.g., substituting latanoprost for travoprost). Another type of therapeutic substitution was separating combination medications into their 2 component generic medications (e.g., substituting timolol and brimonidine for Combigan). Table S2 (available at www.aaojournal.org) lists all therapeutic substitutions used in the analysis. Cost for all drugs prescribed by an eye care provider (brand, generic, or therapeutic) were estimated individually for a 30-day (monthly) supply by dividing the total cost prescribed (sum of all costs over all prescribers in the 2013 PUF) by the total number of 30-day medication supplies prescribed (sum of all 30-day supplies over all prescribers in the 2013 PUF). Prescription drug costs then were recalculated to estimate savings when using the price of the monthly direct generic substitution and using the price of the monthly direct and therapeutic generic substitutions.

To estimate the potential effect of price negotiation, we calculated the total cost for the drug groups (Table S1, available at www.aaojournal.org) if the individual medications in each group were priced at USVA prices, because the USVA is able to negotiate drug prices.[10] Because the volume of ophthalmic drug prescribed is listed in the PUF in terms of number

of days' supply and because the USVA drugs are priced per bottle of eye drops (in milliliters), we estimated the quantity of ophthalmic medication that should be dispensed for a 30-day supply based on each 1 ml of ophthalmic medication having 20 drops.[11] Then, to estimate 30-day supplies, for topical β-blockers, carbonic anhydrase inhibitors, and α-agonists, we assumed twice-daily dosing in both eyes. For prostaglandin analogs, we assumed once-daily dosing in both eyes. For Restasis, we assumed twice-daily dosing in both eyes. For ocular infection and inflammation medications, we assumed dosing in only 1 eye. Because doses are not available in the PUF and multiple vendors may be available for the same drug at a specific dose on the USVA formulary, the lowest price was selected for each drug on the formulary according to previously established methods.[5] Thirteen medications were not available on the USVA formulary and therefore were not included in this analysis: Isopto Carpine, Latisse, Neptazane, Pilopine HS, Rescula, Ocudox, Bromday, Omnipred, Besivance, neomycin–bacitracin–polymyxin, Polycin, sulfacetamide–prednisolone, and homatropine. Associations between type of medication (brand vs. generic) and type of provider (eye care provider vs. other provider) with respect to total medication costs and total 30-day medication volume were evaluated with chi-square tests. Descriptive statistics of the data and analyses were performed using SAS software version 9.4 (SAS Institute, Cary, NC).

Results

Of the total of 1 049 381 unique providers or facilities in the Medicare part D 2013 summary file, 19 616 (1.9%) were ophthalmologists and 25 654 (2.4%) were optometrists. There are approximately 1000 more ophthalmologists represented in this data set than in the 2014 Association of American Medical Colleges Physician Specialty Data Book (contains 2013 data) because the Medicare Part D summary file includes some organizations and group practices in addition to individual physicians. For optometrists, the summary file represents approximately 78% (25 654/ 33 000) of all the optometrists practicing in the United States in 2013 (Table 3).[12,13] Together, the total Medicare part D payment for drugs prescribed by ophthalmologists and optometrists totaled $2.4 billion ($1.97 billion for ophthalmologists and $449 million for optometrists), approximately 2.3% of all Medicare Part D payments ($103.6 billion). Brand medications accounted for a significantly higher proportion of monthly supplies by volume, and therefore also by total cost for eye care providers compared with all other providers (38% vs. 23% by volume, $P < 0.001$; 79% vs. 56% by total cost, $P < 0.001$). Ophthalmologists had the highest percentage of claims for brand name drugs (71%) when compared with all other medical specialties with at least 1000 providers. Ophthalmologists had a median drug cost of $71 per monthly supply of drug prescribed (interquartile range [IQR], $55–$90) over all providers. Approximately 67% of claims from optometrists were for brand name medications. Optometrists had a median drug cost per monthly supply of drug prescribed of $94 (IQR, $67–$132).

The total Medicare part D payment for drugs prescribed by ophthalmologists and optometrists in the PUF totaled $2.1 billion dollars ($1.8 billion for ophthalmologists and $340 million for optometrists), and the same medications totaled an additional $1.2 billion when prescribed by other types of providers (excluding drugs in the other, or nonophthalmic, category; Table 4). Brand medications, excluding the other category, accounted for 38% of

the total volume of ophthalmic medications and accounted for 79% of the total costs attributable to eye-care providers. For the same panel of medications, non–eye-care providers prescribed brand medications because only 23% of the total volume and 56% of the total cost (a significant difference between provider types; 79% vs. 56% of total cost, $P < 0.001$). The median cost per monthly supply of overall ophthalmic medications prescribed by eye care providers was $95/month (IQR, $23–$146/month), that for brand medications was $141/month (IQR, $119–$204/month), and that for generic ophthalmic medications was $24/month (IQR, $16–$39/month). The top 15 ophthalmic medications by total payments prescribed by eye care providers are summarized in Table 5, and the top 15 ophthalmic medications by total volume are summarized in Table S6 (available at www.aaojournal.org).

Direct substitutions of generic equivalents for brand medications would decrease the total cost of ophthalmic medications prescribed by eye care providers by $148 million (7% reduction in expenditures). If therapeutic substitutions and generic substitutions were combined, total costs would decrease to $1.2 billion, resulting in a savings of $882 million (42% reduction). If Medicare negotiated ophthalmic drug prices similar to those negotiated by the federal government on behalf of the USVA, total cost would decrease from $2.06 billion to $968 million, saving $1.09 billion (53% reduction in expenditures).

Four categories of ophthalmic medications accounted for 96% of the cost attributable to eye care providers. In order, these categories were glaucoma medications, dry eye medications, ocular inflammation medications, and ocular infection medications (Table S1, available at www.aaojournal.org).

Glaucoma Medications

Glaucoma medications generated the highest total costs of any single category of ophthalmic medications at $1.2 billion (54% of total cost for ophthalmic drugs). Eye care providers prescribed more glaucoma medications (72% of the total months' supply) than any other group of ophthalmic drugs. The median cost per 1-month supply of glaucoma medication was $75 (IQR, $19–$121; range, $2–$1387). Glaucoma medications accounted for 8 of the top 15 drugs by total cost and 9 of the 15 drugs prescribed by total volume. Brand medications accounted for 75% of the total glaucoma medication cost, but only 35% of the glaucoma medication volume. If generic medications were substituted for brand medications, there would be $125 million in reduced spending (11% savings on glaucoma medications). Adding therapeutic substitutions would generate $643 million in reduced spending (56% savings on glaucoma medications). Substituting USVA prices for Medicare prices would generate $545 million in savings (47% savings on glaucoma medications).

Dry Eye Medications

Dry eye medications generated the second highest total costs at $376 million, although this medication group was only the fourth highest by volume of prescriptions (5%). Nearly 99% ($371 million) of the total cost of dry eye medications is attributable to 1 brand medication, Restasis (topical cyclosporine), for which there is no generic medication available. The Medicare Part D average payment cost per 1-month supply of Restasis is $293, higher than any other medication in the top 15 drugs by total cost. United States Veterans Administration

price substitution for Restasis would generate $339 million in savings (92% savings on dry eye medications).

Ocular Inflammation Medications

Ocular inflammation medications were the third highest ophthalmic medication group by total cost at $302 million and the second highest by volume (14%). Median cost per 1-month supply for ocular inflammation medications was $44 (IQR, $24–$190; range, $4–1964). Brand medications represented 29% of the total volume of prescribed anti-inflammatories, but 74% of the total cost. Prednisolone acetate was the most commonly prescribed ocular inflammation medication by volume of monthly supplies and total cost ($55 million), representing 18% of the cost of all ophthalmic anti-inflammatories prescribed. Generic substitution would reduce spending by $14 million (5% savings on ocular inflammation medications). If therapeutic substitutions also were added, spending would be reduced by $200 million (66% savings on ocular inflammation medication). United States Veterans Administration price substitution would generate $94 million in savings (34% savings on ocular inflammation medications).

Ocular Infection Medications

Ocular infection medications represented the fourth-highest medication group by total cost at $197 million and the third-highest medication group by volume (7%). Median cost per 1-month supply for ocular infection medications was $59 (IQR, $26–$182; range, $3–$4626). Brand medications represented 32% of the total volume of prescribed antibiotics and accounted for 67% of the total cost. Vigamox (moxifloxacin), a fourth-generation fluoroquinolone, was the most costly prescribed ophthalmic antibiotic and generated $69 million in costs, representing 35% of the total cost of ocular infection medications. Generic substitution for ocular infection medications would result in $9 million in savings (5% savings on ocular infection medications). If therapeutic substitutions also were added, spending would be reduced by $36 million (18% savings on ocular infection medications). United States Veterans Administration price substitution would generate $93 million in savings (55% savings on ocular infection medications).

Discussion

Eye-care providers generated $2.4 billion of Medicare Part D prescription payments in 2013 and had the highest proportion of brand name drug claims by volume (71% for ophthalmologists, 67% for optometrists) when compared with all other providers. Eye care providers prescribed brand name ophthalmic medications that accounted for 79% of the total amount of Medicare prescription drug payments generated. If brand medications were substituted with generic and therapeutic equivalents, when available, it would generate $882 million in Medicare savings (42% reduction of 2013 costs). If Medicare negotiated drug prices and obtained rates similar to those best rates negotiated by the USVA, total expenditures would decrease by 53%, for a savings of $1.09 billion. To reduce prescription drug expenditures for commonly prescribed ophthalmic medications, ophthalmologists should use generic and therapeutic substitution medications when available and appropriate,

and the federal government should consider policies for negotiating drug prices for Medicare Part D.

Brand medication costs are covered variably by insurance, so patients often bare the cost. High costs result in less frequent medication purchases and lead to lower medication adherence.[14,15] More than half of patients do not take the medication they are prescribed.[16] This likely limits the effectiveness of drugs much more significantly than differences in biological drug efficacy between brand and generic medications that is discussed more in detail below. In fact, in one study of 8427 patients with open-angle glaucoma, patients who continued with brand name prostaglandins were 39% more likely to have reduced adherence rates compared with generic medication users.[14] Thus, it is likely critically important to prescribe less expensive medications as first-line therapies to help decrease the risk of cost-related medication nonadherence.

Providers encounter barriers to using generic medications. Some eye-care providers are concerned about the efficacy of generic ophthalmic medications because the Food and Drug Administration (FDA) does not require most generic medications to undergo efficacy testing in clinical trials.[17–19] The FDA requires systemic generic medications to demonstrate pharmaceutical and bioequivalence to the parent drug, but topical generic drugs need to demonstrate pharmaceutical equivalence, not bioequivalence. The purpose of this FDA policy is to lower regulatory burden and thus to promote generic ophthalmic medication development. Demonstrating topical (and intraocular) bioequivalence is complex and would greatly limit the number of generic equivalents that could come to market.[20] Pharmaceutical companies have argued for the necessity of both pharmaceutical and bioequivalence likely to limit the number of available generics.[21] However, the FDA has held their position that bioequivalence testing is not required.[22] Despite the more lenient policy by the FDA, eye care providers may believe that generic medications are less effective than brand medications, a frequent argument presented in the lay literature.

There are very few comparative effectiveness trials between brand and generic medications. There are no reports in the literature directly comparing Restasis, the medication with the highest total cost attributable to eye care providers, with a generic version of cyclosporine. Restasis has been compared with artificial tears, inactive vehicle, aqueous vehicle, and other agents.[23–27] Most studies have found Restasis to be statistically more effective than those treatments and have shown favorable improvements in some patient-centered outcome measures (such as symptoms or one of the diagnostic markers of dry eye syndrome). However, the specific outcome measure that improved with Restasis (compared with the control medication) varied depending on the study population, the trial design, and the vehicle used. In a recent meta-analysis, Zhou et al[28] reported that some clinical signs—tear film break-up time and Schirmer test with anesthesia score—but not clinical symptoms (Ocular Surface Disease Index), improved with Restasis.

For glaucoma medications, we identified only 2 studies, conducted in Italy and India that directly compared efficacy for lowering intraocular pressure (IOP) between generic and brand medication. Both studies compared latanoprost and Xalatan (Pfizer, New York, NY). The double-masked Italian study of 184 patients found no difference in IOP between the

brand and generic medication.[29] However, the crossover study conducted in India of 30 patients not masked to treatment arm found a larger reduction in IOP among patients receiving Xalatan compared with those receiving latanoprost over an initial 12-week period (23.64±3.13 mmHg to 14.29±1.61 mmHg vs. 22.74±2.47 mmHg to 16.98±2.49 mmHg, respectively). At the completion of the crossover, there was no statistically significant difference in IOP between the 2 groups ($P = 0.24$).[30] The difference in outcomes may be explained by the more rigorous design (double masking) of the Italian study or may be the result of differences in the generic medication because regulations differ between Europe and India. However, even if this small study's findings are valid and provide evidence that the brand name glaucoma medication is slightly more effective at lowering IOP than the generic medication, that additional 1 to 2 mmHg may not always be clinically necessary for adequate glaucoma management for a particular individual. However, the additional cost burden leading to decreased adherence to medication may present a higher burden than the potential slight decrease in efficacy.

Yet, some providers appropriately may select brand rather than generic medications by considering factors other than direct patient cost or effectiveness. Generic formulations may have greater variability in the ease of use of the bottle.[31] The influence of bottle ergonomics on medication adherence is important to consider. Likewise, the number of drops dispensed per administration may differ between brand and generic medications, thereby effecting dosing and potentially augmenting the treatment effect.[31] However, if we assume that even 50% of the time, a brand name medication may be indicated clinically for optimal disease management, prescribing 50% less brand name medications would generate a more than $400 million reduction in 2013 Medicare expenditures.

Another potential reason for limited use of generic medication is the industry practice of providing inducements to providers that may influence prescribing behaviors, favoring the use of expensive brand medications.[32,33] One study found that a single meal sponsored by the pharmaceutical industry in which a particular brand name drug was touted resulted in a statistically significant increase in physicians prescribing that brand name medication.[34] For example, physicians who received a single meal promoting Nebivolol, a brand β-blocker medication, had a 70% increased odds (95% confidence interval, 1.69–1.72) of prescribing Nebivolol over therapeutic generic equivalents.[34] In 2013, more than half (53%) of all ophthalmologists had received payments from industry.[35] Ophthalmologists ranked fourth of 11 surgical subspecialists for total payments received from industry at $14.2 million, of which only 33% went to support research.[35] This relationship with industry may influence prescribing patterns toward brand medications, especially in light of the lack of evidence comparing generic and brand medications.

Although providers prescribing more generic medications as first-line therapy would enable significant savings for Medicare, there are times when only policy change will enable savings. If the cost of generic medications increase, such as what occurred in 2014 when the price of Pred Forte, generic prednisolone acetate, and generic phenylephrine soared,[36] changing providers' prescription patterns would not help to reduce costs. A policy change, such as allowing Medicare to negotiate drug prices, would lead to more substantial savings.

There are important limitations to our study. The PUF is limited to providers treating Part D beneficiaries in 2013. Therefore, the prescribing patterns in the PUF might not be representative of how a provider treats non-Medicare patients and prescribing patterns may have changed since 2013, particularly because some medications previously available in only branded preparations are now available in generic formulations. Furthermore, the PUF includes only medications covered by Part D. Some medications are covered by the supplemental benefits of individual Part D plans and other medications, such as injectable or infusion medications (e.g., anti–vascular endothelial growth factor medications), may be covered under Part B benefits. Those medication costs are not accounted for in this analysis. Additionally, the relative rank order of drugs prescribed by eye care providers by both volume and cost as well as spending by specific specialties may differ for non-Medicare populations, particularly because certain eye conditions (e.g., glaucoma) are more common in an older population. Finally, because we do not have patient-level data about Part D beneficiaries, we cannot comment on the quality of prescribing behaviors for individual patients. This also limits our ability to postulate why providers may prescribe brand over generic medications.

Patients, providers, and policy makers are concerned about the ever-increasing costs of medications. One study estimated that Medicare expenditures will increase from 3.3% of United States gross domestic product in 2006 to 13.8% of gross domestic product by 2080.[37] This estimate was made before prescription drug coverage was available through Medicare Part D, so it is likely an underestimation. Policy makers and providers must change practice patterns to limit expenditures on prescription medications for the health of its citizens and the health of the nation’s finances. For ophthalmic medications, options for reducing Medicare costs are policies and programs that encourage generic medications as first-line agents and negotiation of drug prices when generic medications are not available.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations and Acronyms

FDA	Food and Drug Administration
IOP	intraocular pressure
IQR	interquartile range
PUF	public use file
USVA	United States Veterans Administration

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Table 3

Total Medicare Part D Payments over the Course of the 2013 Claim Period by Specialty Type (Specialties with at Least 1000 Providers)

Specialty	Proportion of Claims, Brand	Total Drug Payment, $Millions	No. of Providers	Median No. of 30-Day Drug Supplies Prescribed	Median Payment per 30-Day Supply of Drug, $	Median Payment per Claim, $
Ophthalmology	0.71	1970	19616	846	71	76
Optometry	0.67	449	25 654	73	94	96
Pulmonary disease	0.53	2397	8882	967	159	178
Endocrinology	0.52	2059	5261	2737	99	165
Infectious disease	0.48	1660	4851	320	472	406
Allergy/immunology	0.44	399	3928	419	104	122
Obstetrics/gynecology	0.40	596	37 034	110	66	73
Diagnostic radiology	0.38	39	5414	27	44	38
Radiation oncology	0.34	30	4334	59	47	34
Gastroenterology	0.33	1765	12 690	727	130	137
Surgery	0.32	321	23 658	39	57	29
Pediatric medicine	0.30	261	14 605	33	50	53
Nephrology	0.27	1968	7871	2083	83	113
Specialty surgery	0.25	1496	54 164	96	54	35
Geriatric medicine	0.25	647	1910	4201	50	54
Neurology	0.24	4984	13 060	1235	141	177
Physician assistant	0.24	3279	69 180	116	51	42
Internal medicine	0.24	26 902	130 640	674	46	56
Rheumatology	0.24	2179	4319	2635	138	187
Nurse practitioner	0.24	6617	97 722	245	51	51
Emergency medicine	0.24	735	43 664	50	55	18
General practice	0.23	1725	11 135	771	40	42
Cardiology	0.23	4331	22 660	3939	33	55
Family practice	0.22	22 374	106 048	2826	41	52
Otolaryngology	0.22	224	10 253	236	57	45
Hematology/oncology	0.21	3757	7844	696	512	526
Medical oncology	0.20	1081	2735	556	474	494

Specialty	Proportion of Claims, Brand	Total Drug Payment, $Millions	No. of Providers	Median No. of 30-Day Drug Supplies Prescribed	Median Payment per 30-Day Supply of Drug, $	Median Payment per Claim, $
Physical medicine and rehabilitation	0.20	524	8056	281	63	59
Anesthesiology	0.20	368	8194	57	60	60
Psychiatry	0.18	4515	25 906	820	88	94
Dermatology	0.18	868	12 327	322	118	90

Table 4

Summary Information by Drug Class, Eye Care Provider Type, and All Other Providers

Drug Class	Total Cost ($)	Cost for Brand/Generic Split (%/%)	Total No. of 30-Day Supply Frequency	30-Day Supply Brand/Generic Split (%/%)	Cost per 30-Day Supply				
					Minimum	*25th Percentile*	*Mediam*	*75 th Percentile*	*Maximum*
Eye care providers (ophthalmologists and optometrists)									
All medications	2 145 148 809	79/21	28 487 093	38/62	0.01	22.55	88.49	144.08	38 651.50
All medications, excluding other	2 118 335 867	79/21	27 996 580	38/62	1.52	23.12	95.46	145.51	4692.16
Glaucoma	1 150 660 957	75/25	20 020 070	35/65	1.52	19.20	75.39	121.17	1387.11
Dry eye	375 804 323	100/0	1 295 445	99/1	12.05	284.67	295.28	303.41	715.70
Ocular inflammation	301 936 820	74/26	3 972 894	29/71	3.75	24.10	44.45	190.07	1963.60
Ocular infections	197 276 535	67/33	2 083 303	32/68	3.40	25.71	58.78	182.23	4626.34
Allergic conjunctivitis	89 904 508	98/2	592 666	94/6	5.68	143.38	154.59	168.11	898.90
Mydriatics	439 815	1/99	29 497	1/99	4.44	11.68	14.67	18.77	85.87
Other	26 812 942	56/44	490 513	14/86	0.01	13.68	28.22	74.12	38 651.50
Other, ophthalmic	2312 910	96/4	2704	41/59	8.76	41.11	49.47	62.38	4692.16
All other providers									
All medications	67 160 565 510	67/33	1 465 184 227	13/87	0.00	8.61	20.32	63.36	370 472.61
All medications, excluding other	1 239 388 374	56/44	13 872 433	23/77	0.02	23.71	40.34	104.37	20 192.34
Glaucoma	98 968 407	60/40	1 638 449	26/74	2.03	20.70	35.36	120.30	969.16
Dry eye	404 428 265	99/1	2 274 622	98/2	8.77	142.07	186.96	207.79	2385.41
Ocular inflammation	74 184 033	5/95	2 233 046	1/99	1.01	18.88	27.53	44.06	2855.01
Ocular infections	502 530 543	32/68	5 526 908	3/97	0.02	25.11	42.16	89.91	12 343.01
Allergic conjunctivitis	67 644 150	77/23	894 567	35/65	4.87	21.56	53.23	164.02	2687.01
Mydriatics	165 123	0/100	3788	0/100	5.01	27.70	49.85	73.28	254.89
Other	65 921 177 136	67/33	1 451 311 793	13/87	0.00	8.36	19.44	61.62	370 472.61
Other, ophthalmic	91 467 854	14/86	1 301 054	0/100	2.49	18.96	29.00	48.46	20 192.34

Table 5

Top 15 Drugs Prescribed by Eye Care Providers Ranked by Total Cost

Generic Drug Name	Rank	Total Cost ($)	No. of Prescribers	Total No. of 30-Day Supplies Prescribed	Proportion of Cost over All Providers	30-Day Supply Brand/Generic Split (%/%)	Average Cost per 30-Day Supply for Brand ($)	Average Cost per 30-Day Supply for Generic ($)
Cyclosporine	1	370 728 551	17 704	1 263 414	0.91	100/0	293.45	-
Bimatoprost	2	291 607 380	18 816	2 243 979	0.95	100/0	129.95	-
Travoprost	3	233 744 237	21 138	1 862 363	0.90	100/0	125.51	-
Brimonidine tartrate	4	174 707 401	18 318	2 110 851	0.93	47/53	118.32	51.32
Brimonidine tartrate/timolol	5	120 092 087	15 069	1 014 382	0.95	100/0	118.39	-
Latanoprost	6	108 681 233	28 227	6 158 525	0.90	1/99	126.04	16.91
Olopatadine HCL	7	79 391 066	11 023	504 455	0.61	100/0	157.38	-
Nepafenac	8	78 340 697	5548	322 052	0.99	100/0	243.25	-
Moxifloxacin HCL	9	68 854 690	6894	333 585	0.75	100/0	206.41	-
Brinzolamide	10	68 205 947	9417	650 948	0.95	100/0	104.78	-
Loteprednol etabonate	11	57 496 251	7250	308 401	0.97	100/0	186.43	-
Dorzolamide HCL/timolol maleate	12	56 890 736	16 540	2 028 896	0.93	1/99	121.13	27.45
Prednisolone acetate	13	54 692 428	16 943	2 023 770	0.97	1/99	76.69	26.39
Timolol maleate	14	47 235 016	20 928	2 807 689	0.93	1/99	142.74	14.94
Bromfenac sodium	15	45 913 060	3721	215 436	0.99	81/19	226.89	154.32