# Cost-Motivated Treatment Changes in Commercial Claims:

## Implications for Non-Medical Switching

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THE MORAN COMPANY

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Health benefits designs in both private and public health insurance programs include mechanisms to control the costs of care, resulting in many health care choices being made with a focus on financial concerns that could outweigh clinical factors. This can particularly be true for interventions involving prescription drugs and biologics. In some cases, choice of prescription therapy may be driven by patient cost sharing and affordability controls. In others, plan benefit design may result in "non-medical switching" between prescription therapies. Whether by conscious design or inadvertent result, patients with significant chronic disease whose condition has been stabilized on a particular drug regimen can lose access to continued coverage for their therapy, forcing physicians to switch the patient's prescription to an alternative drug.

Whatever the mechanism by which non-medical switching is induced, it raises significant clinical issues for patients who find themselves being switched from a therapy known to be working toward a therapy of presently unknown efficacy. The immediate consequence of cost-motivated treatment changes is the potential for treatment failure. In the intermediate and longer term, the consequences of remediating that treatment failure may be substantial, potentially off-setting some or all of the immediate "savings" that accrue because of the switch in therapies.

In a prior study for the Institute for Patient Access (IfPA), The Moran Company investigated whether the effect of non-medical switching on Medicare spending could be demonstrated by analyses of Medicare claims data. In that study, we found that switching between Part B drugs occurred at different levels in patients being treated for various conditions. We further found that for rheumatoid arthritis patients, total non-drug Medicare Part B spending increased materially for patients with one or more switches to less expensive medications.[1]

IfPA asked us to extend our prior analysis of switching issues in Medicare by examining these issues in commercial claims data. Using a sample of Truven's MarketScan® Commercial Claims and Encounters and Medicare Supplemental database for chronic conditions of interest, we analyzed the prevalence of switching for various populations and examined the drug and non-drug costs of studied patient populations before and after identified switching events. Since it is not possible to track patients across plans, our claims come from patients who maintained consistent coverage for at least three of the five years in claims data. Thus, our analysis probably understates the level of switching in the populations being studied.

As we present in the paper that follows, we again found evidence to support our hypothesis that cost-motivated treatment changes can lead to higher costs for patients with various conditions, in this case for patients with Crohn's disease, osteoarthritis, multiple sclerosis, rheumatoid arthritis, and psoriasis.

[1] *Cost-Motivated Treatment Changes in Medicare Part B: Implications for Non-Medical Switching.* The Moran Company (September 2016). http://1yh21u3cjptv3xjder1dco9mx5s.wpengine.netdna-cdn.com/wp-content/uploads/2016/10/Switching-Study-Report-FINAL.pdf

## Highlights of Our Findings:

***Overall***

- Our analysis of commercial claims found that the different diagnostic cohorts had rates from 5% to 64% for switching between chronic medications for the twelve conditions selected for analysis.
- In comparison to prior examination of Medicare claims analysis, this work is able to examine both physician office and pharmacy claims.
- In comparison to that prior work, we can see switching behavior resulting in spending differentials across a broader arrays of conditions.
    - In our prior work, we found that material differences in non-drug medical spending after a switch occurred only for patients with rheumatoid arthritis.
    - In the present analysis we reached this finding for five conditions; for two conditions, our finding was statistically significant.
- It is important to note that population differences between the Medicare and commercial populations make direct comparisons more complex than we can capture in this analysis.
- Limitations in claims data regarding clinical motives for switching behavior also affect the interpretation of our results.
- Notwithstanding these limitations, in this analysis, we found five conditions for which we have direct evidence that patients switched to lower-cost drugs subsequently experience, on average, higher covered non-drug costs downstream of the switch: Crohn's disease, multiple sclerosis, chronic obstructive pulmonary disorder, psoriasis, and rheumatoid arthritis.
- For these conditions, we also see higher post-switch non-drug costs for those who experienced multiple switches.
- For six of the remaining seven conditions, we found that patients who switched to a lower cost medication did not have significantly different non-pharmacy spending compared to those that switched to a higher cost medication.
    - Only chronic pain patients who switched to a lower cost medication were found to have significantly lower non-pharmacy spending than those who switched to a higher cost medication.
- As found in the prior work, patients who switched medications were likely (>50%) to switch again in eight of the twelve disease states.
- Across all the conditions with adequate statistical power, patients who did not switch drugs had the lowest spending, and spending growth, observed in our sample compared to patients with one or more switches of any type.
- Because our data were designed to track patients with continuous coverage, our results do not include individuals who switch plans and are required to go through step therapy again as a result.
    - Consequently, our findings probably understate the level of switching for patients covered by commercial plans.

***Disease Specific***

- As a result of the differences between the two study populations, it is not surprising that the prevalence of switching in various patient populations differs in the two analyses:
    - Rheumatoid Arthritis – the switching rate for Medicare beneficiaries was 9.9%, but within the commercial data 23.0% of patients were observed to have switched.
    - Crohn's Disease – the switching rate for Medicare beneficiaries was 8.1%, but within the commercial data 38.3% of patients were observed to have switched.
    - Immunodeficiency – Switching for Medicare beneficiaries was 29.4%, whereas only 10.0% of commercial patients were observed to have switched.
- Crohn's Disease –
    - Patients who did not switch appeared the most stable, as they had the lowest spending and spending growth levels observed for Crohn's patients in our sample.
    - Patients who switched to a lower cost medication had a similar increase in spending to those patients with multiple switches.
    - Patients who switched to a higher cost medication had a significantly lower difference in per member per month (PMPM) spending during the periods of our analysis.
- Multiple Sclerosis –
    - The group of patients who switched to a lower cost medication had the largest increase in PMPM spending compared to the other three groups.
    - Patients who switched to a higher cost medication had a significantly lower change in PMPM spending compared to those that switched to a high cost medication.
- For patients with psoriasis, chronic obstructive pulmonary disorder (COPD) and rheumatoid arthritis, we reached similar findings: –
    - Patients who switched to a lower cost medication had a similar change in PMPM spending than those with multiple switches.

The balance of this report discusses the results of each diagnostic cohort in detail and follows with a discussion of methodology. Appendices provide additional background.

## Results

In the present analysis, we have adopted a number of assumptions that are similar to those used in our Medicare study. For example, we have assumed that a patient switching from a lower cost drug to a higher cost drug would not do so for cost motivated reasons. Therefore, we presume that such a switch would not be considered a non-medical switch for purposes of this analysis. In the section that follows, we present information about prevalence of switching by patient population and note changes observed in per member per month (PMPM) spending across patients with various kinds of identified switches.

In our analysis, we defined the first date a patient appeared with an applicable diagnosis as the "index date." Patients were required to be eligible for pharmacy and medical benefits from six months prior to the index date, defined as the "prior period", to twelve months after the index date, defined as the "post period". Our spending comparisons presented below measure spending for patients in these periods based on the switches observed for those patients.

*Switching*

As can be seen in Table 1 (below), switching behavior varied across the various diagnostic cohorts for the twelve conditions selected for initial analysis. Switching ranged from 64% of patients (Asthma) to only 5% (Hypercholesterolemia). Additionally, if one switch was made, patients were likely to switch again in all but four conditions. For example, the cohort of hypercholesterolemia patients only had 5% of patients with switching; however, 66% of patients with switches switched again. The percent of patients that switched again ranged from 27% to 83% across all diagnoses.

*Table 1 – Summary of Switching Behavior Across Diagnostic Cohorts*

| Diagnoses | Total Number of Patients | Total Switches | Number of Patients who Switched One or More Times | Number of Patients who Switched 2+ Times | Percentage of Patients with at least one Switch | Percentage of Patients who Switched Again |
|---|---|---|---|---|---|---|
| Asthma | 83,161 | 191,298 | 14,455 | 38,798 | 64% | 73% |
| Crohn's Disease | 23,047 | 28,518 | 3,092 | 5,736 | 38% | 65% |
| Chronic Pain | 82,185 | 72,787 | 6,377 | 13,886 | 25% | 69% |
| COPD | 269,627 | 78,486 | 18,075 | 17,557 | 13% | 49% |
| Cystic Fibrosis | 753 | 794 | 29 | 142 | 23% | 83% |
| Hepatitis C | 2,097 | 2,210 | 121 | 517 | 30% | 81% |
| Hypercholesterolemia | 76,126 | 13,117 | 1,280 | 2,525 | 5% | 66% |
| Immunodeficiency | 2,790 | 426 | 202 | 76 | 10% | 27% |
| Multiple Sclerosis | 14,864 | 7,112 | 1,662 | 1,843 | 24% | 53% |
| Osteoporosis | 13,605 | 1,652 | 364 | 371 | 5% | 50% |
| Psoriasis | 31,215 | 3,848 | 1,527 | 786 | 7% | 34% |
| Rheumatoid Arthritis | 43,249 | 19,303 | 6,197 | 3,754 | 23% | 38% |

*Crohn's Disease*

Nearly 40% of the Crohn's disease patients demonstrated switching behavior during the post period. Patients that did not switch medications had the lowest PMPM spending in the post period as well as the smallest change from prior-to-post period. For those patients that switched only once, essentially half of them switched to a higher cost medication. Those patients that switched to a higher cost medication had significantly lower change in their PMPM spending ($t$ = 4.71, $p < .0001$) than those that switched to a lower cost medication.

These results support a finding that for patients with Crohn's disease, cost-motivated treatment changes may have resulted in higher levels of medical spending.

*Table 2 – Crohn's Disease - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 14,219 | 62% | 1,441 | 6% | 1,651 | 7% | 5,736 | 25% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 1,314 | $ 3,520 | $ 1,384 | $ 3,379 | $ 1,423 | $ 3,520 | $ 1,726 | $ 3,854 |
| Post Period | $ 3,386 | $ 6,596 | $ 5,883 | $ 9,290 | $ 4,578 | $ 8,093 | $ 6,615 | $ 9,874 |
| Difference Between Periods | $ 2,072 | $ 3,076 | $ 4,499 | $ 5,910 | $ 3,155 | $ 4,573 | $ 4,890 | $ 6,020 |

*Multiple Sclerosis*

Switching behavior was less prevalent in MS, as only 24% of patients qualified as switching in the post-index period. The frequency of people who switched to a higher cost medication was nearly double those who switched to a lower cost medication. As seen in Crohn's disease, those patients who switched to a higher cost medication also had a significantly smaller PMPM change from prior-to-post period compared to those who switched to a lower cost medication ($t = 4.88$, $p < .0001$). Interestingly, those patients that had only one switch to a lower cost medication saw the highest change in PMPM across the four mutually exclusive groups.

*Table 3 – Multiple Sclerosis - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 11,359 | 76% | 574 | 4% | 1,088 | 7% | 1,843 | 12% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 1,057 | $ 3,107 | $ 1,269 | $ 2,648 | $ 1,044 | $ 2,072 | $ 1,143 | $ 2,570 |
| Post Period | $ 2,823 | $ 6,157 | $ 5,631 | $ 8,502 | $ 3,524 | $ 6,812 | $ 3,768 | $ 6,661 |
| Difference Between Periods | $ 1,766 | $ 3,050 | $ 4,362 | $ 5,855 | $ 2,479 | $ 4,740 | $ 2,625 | $ 4,091 |

Thus, our analysis tends to support the hypothesis that MS patients subject to non-medical switching have higher non-drug medical spending than patients who do not switch medications or switch to a higher cost prescription.

*Psoriasis*

Switching behavior was rare within the psoriasis cohort, as only 7% of patients switched medications. The patients that had one switch and switched to a lower cost medication had a PMPM change that was similar to patients that did not switch medications. Also, patients with multiple switches saw a similar change in PMPM costs as those who switched once but went to a higher medication. Unlike the previously mentioned cohorts, the change in PMPM was not significantly lower for patients that switched to a lower costing medication ($t$ = 1.11, $p$ = .27).

*Table 4 – Psoriasis - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 28,902 | 93% | 719 | 2% | 808 | 3% | 786 | 3% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 398 | $ 1,233 | $ 449 | $ 1,331 | $ 425 | $ 1,340 | $ 419 | $ 1,070 |
| Post Period | $ 986 | $ 2,200 | $ 1,097 | $ 2,068 | $ 956 | $ 1,928 | $ 1,090 | $ 2,173 |
| Difference Between Periods | $ 588 | $ 967 | $ 648 | $ 737 | $ 531 | $ 588 | $ 671 | $ 1,103 |

*Chronic Obstructive Pulmonary Disorder (COPD)*

Thirteen percent of COPD patients switched medications during the post period. Patients who did not switch were clearly the least expensive sub-group of the cohort and also saw the smallest change in PMPM from prior-to-post period. When only one switch occurred, patients were nearly twice more likely to switch to a more expensive medication. While patients who switched to a more expensive medication did have a smaller change in PMPM ($2,192 vs. $2,316), the difference between the groups was not significant ($t$ = 1.25, $p$ = .21). Patients with multiple switches were the most expensive and had the most dramatic increase from prior-to-post period.

*Table 5 – Chronic Obstructive Pulmonary Disorder - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 233,995 | 87% | 6,569 | 2% | 11,506 | 4% | 17,557 | 7% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 755 | $ 2,365 | $ 1,159 | $ 3,026 | $ 964 | $ 2,708 | $ 1,298 | $ 3,334 |
| Post Period | $ 2,062 | $ 5,065 | $ 3,475 | $ 7,070 | $ 3,156 | $ 6,164 | $ 4,469 | $ 8,035 |
| Difference Between Periods | $ 1,307 | $ 2,700 | $ 2,316 | $ 4,044 | $ 2,192 | $ 3,456 | $ 3,171 | $ 4,701 |

*Rheumatoid Arthritis (RA)*

23% of the patients in our RA sample switched medications during the post period. As seen in other cohorts, the patients who did not switch medications had the smallest non-pharmacy PMPM of the four groups. The majority of patients with one medication switch went to a more expensive drug. Additionally, those patients that switched to a more expensive drug also had a smaller PMPM change from prior-to-post period compared to patients that switched to a lower cost medication. However, the difference between these two groups was not significant ($t$ = 0.94, $p$ = .35).

*Table 6 – RA - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 33,298 | 77% | 702 | 2% | 5,495 | 13% | 3,754 | 9% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 967 | $ 2,362 | $ 1,316 | $ 2,802 | $ 905 | $ 1,901 | $ 1,016 | $ 2,344 |
| Post Period | $ 2,441 | $ 5,209 | $ 3,210 | $ 4,617 | $ 2,622 | $ 4,959 | $ 2,730 | $ 4,858 |
| Difference Between Periods | $ 1,474 | $ 2,847 | $ 1,894 | $ 1,815 | $ 1,717 | $ 3,059 | $ 1,714 | $ 2,514 |

*Other Diagnostic Conditions Analyzed*

In addition to the above mentioned conditions (as reported in Tables 2-6), the results from seven other conditions fell into three categories.

Three of the conditions (asthma, osteoporosis, and hypercholesterolemia) had non-significant differences in non-pharmacy spending between those patients who switched from a low cost medication compared to those that switched to a high cost medication. Even when comparing total health care costs (i.e. both pharmacy and non-pharmacy spending combined), the patients that switched to a lower cost medication did not have significantly less spending then those that switched to a high cost.

Three of the conditions (cystic fibrosis, hepatitis C, and immunodeficiency) had either a small initial sample size or small switching rate that prohibits conclusions with regard to the impact of switching behavior.

One condition, chronic pain, did have significantly lower change of PMPM non-pharmacy spending for those patients who switched to a lower medication ($t$ = -2.32, $p$ = .021).

All tables for these seven additional conditions can be found in Appendix A.

*PMPM Regardless of Switching Category*

In Table 7 (see below), we examined average pharmacy and non-pharmacy (i.e. all medical expenses after excluding pharmacy) PMPM spending for all patients within the diagnostic cohorts. The pre-period is the six months prior to their first diagnoses, and we can see that every cohort across the board saw increased spending for both pharmacy and non-pharmacy in the post-period.

*Table 7 – PMPM – Regardless of Switching Category*

| Diagnoses | Non Pharmacy Payments | | Pharmacy Payments | |
|---|---|---|---|---|
| | Pre Period | Post Period | Pre Period | Post Period |
| Asthma | $ 875 | $ 2,075 | $ 144 | $ 354 |
| Crohn's Disease | $ 1,428 | $ 4,431 | $ 190 | $ 750 |
| Chronic Pain | $ 2,616 | $ 5,949 | $ 246 | $ 583 |
| COPD | $ 809 | $ 2,300 | $ 115 | $ 297 |
| Cystic Fibrosis | $ 3,919 | $ 10,366 | $ 507 | $ 2,233 |
| Hepatitis C | $ 1,107 | $ 3,433 | $ 321 | $ 5,914 |
| Hypercholesterolemia | $ 1,023 | $ 2,866 | $ 169 | $ 401 |
| Immunodeficiency | $ 12,436 | $ 18,737 | $ 467 | $ 1,431 |
| Multiple Sclerosis | $ 1,075 | $ 3,100 | $ 510 | $ 2,459 |
| Osteoporosis | $ 1,158 | $ 2,647 | $ 238 | $ 596 |
| Psoriasis | $ 401 | $ 990 | $ 100 | $ 472 |
| Rheumatoid Arthritis | $ 969 | $ 2,501 | $ 211 | $ 838 |

## Methodology

*Commercial Claims Data*

This retrospective cohort analysis used the Truven Health Marketscan® Commercial Claim and Encounters Database from 2011-2015. This extract used from the database contains information for 3.9 million people from 2011-2015. One limitation of studies with commercial claims data involves an inability to track patients that move from one plan to another. To mitigate this problem, the database we received was drawn from patients that had three years of continuous coverage during the study period. Detailed information within this database include inpatient and outpatient visits/services, outpatient prescription drug claims, enrollment information, and demographic variables. Survey participants in the commercial database are from self-insured employers as well as health plans of different types.

*Demographic Information*

Demographics for the various disorders can be found in the Appendix B. As expected, the average ages for all diagnoses cohorts were appreciably younger than what one would find in a Medicare analyses. Gender breakouts also appear to be similar to previously published reports. For example, RA, MS, and osteoporosis patients are largely female (68%, 75%, and 99%, respectively), while cystic fibrosis and hepatitis C patients are ~60% male (60% and 61%, respectively). Also, the patients in each cohort are not localized to one region of the country. For each diagnostic cohort, the southern region is most prevalent.

*Identifying Participants*

We created twelve analytic files, one for each disease under evaluation.[2] For each file, all patients with at least one diagnosis of interest[3] in either an inpatient stay or any outpatient service from July 2011 to December 2014, were included in the sample frame of patients under study. The first date of the applicable diagnosis was then defined as the "index date." Patients were required to be eligible for pharmacy and medical benefits from six months prior to the index date, defined as the "prior period", to twelve months after the index date, defined as the "post period". The post period includes the index date, and the prior period ends one day before the index date. If a patient appeared in multiple analytic datasets, they were included in each study. Patients were dropped from the study if they had Medicare coverage at any point during the evaluation period.

*Identifying Applicable Medications*

Within each disease state, the patient's entire outpatient pharmaceutical data were extracted. All duplicate NDC codes within a patient were removed. We then examined the 100 most frequently

[2] Asthma, Crohn's Disease, Chronic Pain, Chronic Obstructive Pulmonary Disease (COPD), Cystic Fibrosis, Hepatitis C, Hypercholesterolemia, Immunodeficiency, Multiple Sclerosis, Osteoporosis, Psoriasis, and Rheumatoid Arthritis.
[3] Appendix C

occurring medications, by generic name. This list was assessed for medications that treat chronic symptoms of the respective disease state. In addition, IfPA also reviewed the list with assistance from clinical experts, adding a few medications that did not occur in the top 100 in our analysis. Finally, an internet-based review of chronic medications for each disease state was performed, which further refined the list of common medications. From this list, we then deleted all NDCs that were listed as being for short-term acute conditions.[4] Once the list of medications was finalized, all NDC codes for the specified medications were pulled from the data. The final list of medications used for each diagnoses cohort can be found in Appendix D.

*Standardized Monthly Cost of Pharmaceutical Treatment*

Prescribed medications can come in various days' supply and prescribed regimens, so in order to create a standardized price for each medication to be used to evaluate switching behavior between drugs we calculated the cost per month for each drug. The pharmaceutical prices were standardized in one of two ways, depending on whether a days' supply field was available on the claim. For those medications found in the outpatient pharmaceutical table, the cost of the medication was divided by the days' supply and then multiplied by 30 (i.e. 30 days). For those medications found in the outpatient services table (i.e. infusions) where the concept of "days' supply" does not apply, we took the service date of the medication and then looked 30 days ahead. Any medications with the same generic name in the 30-day window then had payment information combined. Once all medications had total per month costs, the average cost across all patients were calculated.

We then defined patients into three switching strata depending on their switching behavior during the post-period. Patients were classified as 1) switching to pharmaceutical treatment with a standardized month cost of 20% more than the original drug, 2) switching to a drug with a standardized cost of at least 20% less than the original drug, or 3) not switching or switching to a drug that was within 20% in cost.

*Total Per Member Per Month Medical Costs during the Prior and Post Periods.*

To evaluate the total cost of treatment associated with switching, we summed all-cause treatment for inpatient, outpatient, and prescription services for the prior period and the post period for each patient. These total costs were then standardized to per member per month costs (PMPM) by dividing the total costs for all patients in each switching strata by either six (prior period) or 12 (post period).

## Conclusion

The patients in our present analysis represent a materially different population than the Medicare population, which make direct comparisons between our two studies more complex than we can capture in this analysis. In contrast to our prior study, the current analysis is able to examine switching involving both physician-administered and pharmacy benefit drugs, but commercial claims data—as with Medicare—provide limited information about the motives for particular

[4] The variable used was MAINTIN with a value of "3" …short-term treatment of acute conditions".

switches. Notwithstanding these issues, we found five conditions for which we have direct evidence that patients switched to lower-cost drugs subsequently experienced, on average, higher covered non-drug costs downstream of those switches. In addition, we also found for another six conditions that switching to a lower cost medication did not result in less expensive non-pharmacy spending compared to those that did switch to a higher cost medication.

While it is possible to utilize this commercial claims database in order to evaluate switching, the results may underestimate the real-world effect of this behavior. Patients that change insurance carriers cannot be captured when the analysis requires continuous eligibility throughout the examination period. Individuals that changed carriers may be required to undergo step therapy again, which would increase switching rates.

Thus, as we found in our prior study of Medicare claims, our study of commercial claims supports the hypothesis that cost-motivated switching among treatments may lead to higher costs in patients with certain conditions.

# Appendix A – Other Diagnostic Conditions Analyzed

*Table A1 – Asthma - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 29,908 | 36% | 5,818 | 7% | 8,637 | 10% | 38,798 | 47% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 755 | $ 2,061 | $ 874 | $ 2,323 | $ 722 | $ 1,789 | $ 1,001 | $ 2,329 |
| Post Period | $ 1,730 | $ 4,093 | $ 1,910 | $ 3,961 | $ 1,806 | $ 3,900 | $ 2,426 | $ 4,680 |
| Difference Between Periods | $ 975 | $ 2,032 | $ 1,035 | $ 1,638 | $ 1,084 | $ 2,111 | $ 1,425 | $ 2,351 |

*Table A2 – Osteoporosis - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 12,870 | 95% | 178 | 1% | 186 | 1% | 371 | 3% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 1,144 | $ 2,585 | $ 1,142 | $ 2,053 | $ 1,334 | $ 3,082 | $ 1,582 | $ 3,188 |
| Post Period | $ 2,611 | $ 4,886 | $ 3,139 | $ 5,942 | $ 3,715 | $ 6,547 | $ 3,123 | $ 4,951 |
| Difference Between Periods | $ 1,467 | $ 2,301 | $ 1,997 | $ 3,889 | $ 2,380 | $ 3,465 | $ 1,540 | $ 1,763 |

*Table A3 – Chronic Pain - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 61,922 | 75% | 2,588 | 3% | 3,789 | 5% | 13,886 | 17% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 2,248 | $ 5,712 | $ 3,620 | $ 8,637 | $ 3,439 | $ 7,688 | $ 3,850 | $ 8,482 |
| Post Period | $ 5,106 | $ 8,954 | $ 7,761 | $ 10,773 | $ 8,278 | $ 12,164 | $ 8,736 | $ 13,228 |
| Difference Between Periods | $ 2,859 | $ 3,242 | $ 4,141 | $ 2,136 | $ 4,839 | $ 4,476 | $ 4,886 | $ 4,746 |

*Table A4 – Hypercholesterolemia - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 72,321 | 95% | 579 | 1% | 701 | 1% | 2,525 | 3% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 1,018 | $ 2,786 | $ 1,148 | $ 2,820 | $ 1,316 | $ 3,564 | $ 1,062 | $ 2,756 |
| Post Period | $ 2,847 | $ 5,841 | $ 3,125 | $ 5,559 | $ 3,732 | $ 7,219 | $ 3,104 | $ 6,034 |
| Difference Between Periods | $ 1,829 | $ 3,055 | $ 1,977 | $ 2,740 | $ 2,416 | $ 3,655 | $ 2,042 | $ 3,279 |

*Table A5 – Cystic Fibrosis - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 582 | 77% | 12 | 2% | 17 | 2% | 142 | 19% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 4,285 | $ 12,234 | $ 10,547 | $ 19,169 | $ 293 | $ 432 | $ 2,293 | $ 8,835 |
| Post Period | $ 10,780 | $ 20,340 | $ 41,212 | $ 77,686 | $ 2,464 | $ 4,840 | $ 7,007 | $ 13,937 |
| Difference Between Periods | $ 6,496 | $ 8,106 | $ 30,665 | $ 58,517 | $ 2,170 | $ 4,408 | $ 4,714 | $ 5,102 |

*Table A6 – Hepatitis C - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 1,459 | 70% | 23 | 1% | 98 | 5% | 517 | 25% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 1,213 | $ 3,751 | $ 808 | $ 1,315 | $ 627 | $ 977 | $ 911 | $ 2,986 |
| Post Period | $ 3,547 | $ 7,625 | $ 2,918 | $ 4,044 | $ 2,825 | $ 4,738 | $ 3,248 | $ 6,106 |
| Difference Between Periods | $ 2,334 | $ 3,875 | $ 2,110 | $ 2,729 | $ 2,198 | $ 3,761 | $ 2,337 | $ 3,120 |

*Table A7 – Immunodeficiency - Switching Frequency and Cost Implications*

| Switch Category | No Switches | | 1 Switch | | | | >1 Switches | |
|---|---|---|---|---|---|---|---|---|
| | | | Switched to Lower | | Switched to Higher | | | |
| | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD | n / mean | % / SD |
| Number of Patients | 2,512 | 90% | 100 | 4% | 102 | 4% | 76 | 3% |
| Non-Pharmacy PMPM Spending | | | | | | | | |
| Prior Period | $ 12,529 | $ 31,507 | $ 9,623 | $ 18,369 | $ 12,918 | $ 26,848 | $ 12,425 | $ 26,110 |
| Post Period | $ 18,490 | $ 29,792 | $ 18,262 | $ 21,644 | $ 21,008 | $ 24,029 | $ 24,468 | $ 35,884 |
| Difference Between Periods | $ 5,961 | $ (1,716) | $ 8,639 | $ 3,275 | $ 8,090 | $ (2,819) | $ 12,042 | $ 9,774 |

# Appendix B – Demographic Information, By Diagnosis Group

| | | Asthma | | Crohn's Disease | | Chronic Pain | | COPD | |
|---|---|---|---|---|---|---|---|---|---|
| | | n | %/ SD | n | %/ SD | n | %/ SD | n | %/ SD |
| Total | | 83,161 | 100% | 23,045 | 100% | 82,183 | 100% | 269,614 | 100% |
| Gender | Male | 30,165 | 36.3% | 10,056 | 43.6% | 31,723 | 38.6% | 106,815 | 39.6% |
| | Female | 52,996 | 63.7% | 12,989 | 56.4% | 50,460 | 61.4% | 162,799 | 60.4% |
| Average Age | Mean / Std | 37.0 | 20.0 | 40.2 | 15.2 | 48.6 | 11.0 | 44.5 | 16.0 |
| Age Group | Less than 18 | 21,702 | 26.1% | 2,294 | 10.0% | 998 | 1.2% | 26,800 | 9.9% |
| | 18 - 34 | 9,855 | 11.9% | 5,660 | 24.6% | 8,683 | 10.6% | 33,525 | 12.4% |
| | 35 - 44 | 12,051 | 14.5% | 4,542 | 19.7% | 14,659 | 17.8% | 42,908 | 15.9% |
| | 45 - 54 | 19,079 | 22.9% | 5,678 | 24.6% | 28,232 | 34.4% | 74,062 | 27.5% |
| | 56 - 64 | 20,474 | 24.6% | 4,871 | 21.1% | 29,611 | 36.0% | 92,319 | 34.2% |
| Region | South | 34,280 | 41.2% | 9,064 | 39.3% | 32,131 | 39.1% | 119,815 | 44.4% |
| | Midwest | 15,604 | 18.8% | 5,200 | 22.6% | 18,601 | 22.6% | 65,054 | 24.1% |
| | Northeast | 18,162 | 21.8% | 5,010 | 21.7% | 10,464 | 12.7% | 43,585 | 16.2% |
| | West | 13,697 | 16.5% | 3,246 | 14.1% | 19,740 | 24.0% | 36,898 | 13.7% |

| | | Cystic Fibrosis | | Hepatitis C | | Hypercholesterol | | Immunodeficiency | |
|---|---|---|---|---|---|---|---|---|---|
| | | n | %/ SD | n | %/ SD | n | %/ SD | n | %/ SD |
| Total | | 924 | 100% | 2,097 | 100% | 76,125 | 100% | 611 | 100% |
| Gender | Male | 552 | 59.7% | 1,273 | 60.7% | 38,087 | 50.0% | 257 | 42.1% |
| | Female | 372 | 40.3% | 824 | 39.3% | 38,038 | 50.0% | 354 | 57.9% |
| Average Age | Mean / Std | 35.3 | 18.5 | 53.3 | 8.6 | 54.2 | 19.2 | 46.4 | 19.2 |
| Age Group | Less than 18 | - | 0.0% | - | 0.0% | - | 0.0% | - | 0.0% |
| | 18 - 34 | 181 | 19.6% | - | 0.0% | 1,080 | 1.4% | 66 | 10.8% |
| | 35 - 44 | 94 | 10.2% | 145 | 6.9% | 6,647 | 8.7% | 81 | 13.3% |
| | 45 - 54 | 162 | 17.5% | 654 | 31.2% | 24,902 | 32.7% | 114 | 18.7% |
| | 56 - 64 | 145 | 15.7% | 1,197 | 57.1% | 43,438 | 57.1% | 147 | 24.1% |
| Region | South | 276 | 29.9% | 938 | 44.7% | 31,257 | 41.1% | 192 | 31.4% |
| | Midwest | 155 | 16.8% | 379 | 18.1% | 18,036 | 23.7% | 94 | 15.4% |
| | Northeast | 154 | 16.7% | 440 | 21.0% | 14,516 | 19.1% | 148 | 24.2% |
| | West | 143 | 15.5% | 324 | 15.5% | 11,033 | 14.5% | 107 | 17.5% |

| | | Multiple Sclerosis | | Osteoporosis | | Psoriasis | | Rheumatoid Arthritis | |
|---|---|---|---|---|---|---|---|---|---|
| | | n | %/ SD | n | %/ SD | n | %/ SD | n | %/ SD |
| Total | | 15,031 | 100% | 13,604 | 100% | 31,214 | 100% | 44,688 | 100% |
| Gender | Male | 3,677 | 24.5% | 194 | 1.4% | 14,541 | 46.6% | 14,193 | 31.8% |
| | Female | 11,354 | 75.5% | 13,410 | 98.6% | 16,673 | 53.4% | 30,495 | 68.2% |
| Average Age | Mean / Std | 44.6 | 10.9 | 56.0 | 5.5 | 44.2 | 13.8 | 47.7 | 12.2 |
| Age Group | Less than 18 | - | 0.0% | - | 0.0% | 1,716 | 5.5% | - | 0.0% |
| | 18 - 34 | 2,539 | 16.9% | 71 | 0.5% | 5,464 | 17.5% | 4,430 | 9.9% |
| | 35 - 44 | 4,192 | 27.9% | 415 | 3.1% | 6,268 | 20.1% | 7,913 | 17.7% |
| | 45 - 54 | 4,887 | 32.5% | 3,780 | 27.8% | 9,090 | 29.1% | 14,399 | 32.2% |
| | 56 - 64 | 3,077 | 20.5% | 9,331 | 68.6% | 8,676 | 27.8% | 15,060 | 33.7% |
| Region | South | 5,798 | 38.6% | 6,191 | 45.5% | 11,330 | 36.3% | 18,618 | 41.7% |
| | Midwest | 3,378 | 22.5% | 2,369 | 17.4% | 6,067 | 19.4% | 8,845 | 19.8% |
| | Northeast | 2,902 | 19.3% | 2,435 | 17.9% | 7,325 | 23.5% | 7,154 | 16.0% |
| | West | 2,431 | 16.2% | 2,420 | 17.8% | 5,953 | 19.1% | 7,593 | 17.0% |

## Appendix C – Diagnoses Used to Identify Patients within Cohorts

| Disease State | ICD-9 Diagnosis Code | ICD-10 Diagnosis Code |
|---|---|---|
| Rheumatoid Arthritis | 714.0, 714.1, 714.2, 714.81, 720.0 | M06.x, M05.x, L40.52, M45.x, M08.1, M48.8Xx, M45.9; M46.00;M46.1;M49.80;M46.90 |
| Crohn's Disease | 555.0 | K50.x |
| Multiple Sclerosis | 340.x | G35.x |
| Chronic Obstructive Pulmonary Disorder | 490-492, 494, 496 | J40.x, J41.0, J41.1, J41.8, J42.x, J43.9, J44.0, J44.1, J44.9 |
| Cystic Fibrosis | 277.0 | E84.x |
| Immunodeficiency | 279.x | D80.x - D84.x, D89.810, D89.811, D89.812, D89.813, D89.3, D89.4x, D89.89, D89.9, M35.9 |
| Chronic Pain | 338.2 | G89.21, G89.22, G89.28, G89.29 |
| Psoriasis | 696 | L30.5, L40.0, L40.1, L40.2, L40.3, L40.4, L40.5x, L40.8, L40.9, L41.8, L42.x, L44.0, L44.8, L45 |
| Extrinsic Asthma (Allergic Asthma) | 493.0 | J45.20, J45.30, J45.40, J45.50, J45.909, J45.22, J45.32, J45.42, J45.52, J45.902, J45.21, J45.31, J45.41, J45.51, J45.901 |
| Hepatitis C | 070.51, 070.54 | B18.2, B17.10 |
| Hypercholesterolemia | 272.0 | E78.0x |
| Osteoporosis | 733.0 | M81.0, M81.6, M81.8 |

## Appendix D – Medications Used in Switching Analysis

*Table D1 – Chronic Medications for Treating Asthma*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Prednisone | 76,797 | $ 5 | $ 71 |
| Albuterol Sulfate | 158,721 | $ 35 | $ 74 |
| Montelukast Sodium | 143,594 | $ 48 | $ 107 |
| Fluticasone Propionate | 78,684 | $ 52 | $ 200 |
| Fluticasone Furoate | 3,347 | $ 80 | $ 44 |
| Ciclesonide | 4,512 | $ 179 | $ 257 |
| Budesonide / Formoterol Fumarate | 31,036 | $ 200 | $ 124 |
| Tiotropium Bromide | 12,947 | $ 230 | $ 103 |
| Fluticasone Propionate / Salmeterol Xinafoate | 61,516 | $ 235 | $ 213 |

*Table D2 – Chronic Medications for Treating Crohn's Disease*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Sulfasalazine | 7,812 | $ 19 | $ 19 |
| Azathioprine | 20,533 | $ 27 | $ 49 |
| Budesonide | 19,230 | $ 995 | $ 643 |
| Certolizumab Pegol | 2,601 | $ 2,866 | $ 1,818 |
| Adalimumab | 23,068 | $ 3,369 | $ 3,043 |
| Golimumab | 373 | $ 4,028 | $ 2,851 |
| Natalizumab | 139 | $ 4,267 | $ 3,830 |
| Infliximab | 15,359 | $ 4,656 | $ 4,189 |
| Ustekinumab | 106 | $ 6,899 | $ 7,066 |
| Vedolizumab | 33 | $ 7,238 | $ 5,434 |
| Rituximab | 201 | $ 11,512 | $ 11,558 |

*Table D3 – Chronic Medications for Treating Chronic Pain*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Oxymetazoline Hydrochloride | 6 | $ 18 | $ 44 |
| Guaifenesin | 5 | $ 19 | $ 6 |
| Gabapentin | 214,861 | $ 60 | $ 282 |
| Morphine Sulfate | 86,376 | $ 103 | $ 504 |
| Acetaminophen / Hydrocodone Bitartrate | 9,779 | $ 153 | $ 102 |
| Celecoxib | 32,807 | $ 173 | $ 107 |
| Fentanyl | 65,234 | $ 202 | $ 393 |
| Oxycodone Hydrochloride | 228,885 | $ 215 | $ 411 |
| Acetaminophen / Butalbital / Caffeine | 1,074 | $ 235 | $ 173 |
| Tramadol Hydrochloride | 90 | $ 961 | $ 795 |

*Table D4 – Chronic Medications for Treating COPD*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Prednisone | 387,185 | $ 4 | $ 44 |
| Ipratropium Bromide | 22,786 | $ 74 | $ 240 |
| Olodaterol | 28 | $ 76 | $ 43 |
| Albuterol Sulfate / Ipratropium Bromide | 59,812 | $ 166 | $ 314 |
| Umeclidinium | 54 | $ 170 | $ 43 |
| Formoterol Fumarate/Mometasone Furoat | 27,761 | $ 213 | $ 269 |
| Tiotropium Bromide | 98,378 | $ 223 | $ 74 |
| Umeclidinium Bromide / Vilanterol Trife | 977 | $ 229 | $ 81 |
| Aclidinium Bromide | 5,630 | $ 270 | $ 713 |
| Glycopyrrolate | 27 | $ 314 | $ 383 |
| Budesonide | 42,997 | $ 376 | $ 333 |

*Table D5 – Chronic Medications for Treating Cystic Fibrosis*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Azithromycin | 62 | $ 129 | $ 121 |
| Amylase / Lipase / Protease | 2,445 | $ 1,137 | $ 1,255 |
| Dornase Alfa | 963 | $ 2,872 | $ 1,297 |
| Tobramycin | 388 | $ 5,080 | $ 2,567 |
| Ivacaftor / Lumacaftor | 8 | $ 21,386 | $ 943 |
| Ivacaftor | 87 | $ 26,446 | $ 3,810 |

*Table D6 – Chronic Medications for Treating Hepatitis C*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Ritonavir | 639 | $ 276 | $ 131 |
| Ribavirin | 6,305 | $ 473 | $ 427 |
| Peginterferon Alfa-2B | 744 | $ 2,736 | $ 749 |
| Peginterferon Alfa-2A | 5,508 | $ 2,799 | $ 1,657 |
| Daclatasvir | 8 | $ 22,454 | $ 993 |
| Ledipasvir / Sofosbuvir | 1,157 | $ 32,919 | $ 8,263 |

*Table D7 – Chronic Medications for Treating Hypercholesterolemia*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Simvastatin | 253,830 | $ 7 | $ 95 |
| Lovastatin | 31,007 | $ 7 | $ 28 |
| Gemfibrozil | 15,099 | $ 12 | $ 26 |
| Fluvastatin Sodium | 1,300 | $ 103 | $ 40 |
| Fenofibric Acid | 16,790 | $ 108 | $ 38 |
| Ezetimibe / Simvastatin | 18,832 | $ 118 | $ 39 |
| Ezetimibe | 33,538 | $ 123 | $ 42 |
| Niacin | 21,999 | $ 137 | $ 113 |
| Amlodipine Besylate / Atorv | 3,790 | $ 144 | $ 58 |
| Alirocumab | 5 | $ 488 | $ 668 |

*Table D8 – Chronic Medications for Treating Immunodeficiency*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Hyqvia | 74 | $ 44 | $ 57 |
| Gamimune | 2 | $ 80 | $ 70 |
| Vivaglobin | 5 | $ 142 | $ 260 |
| Hizentra | 5,307 | $ 2,988 | $ 6,300 |
| Octagam | 1,757 | $ 3,930 | $ 3,492 |
| Sandoglobulin | 1,029 | $ 3,661 | $ 4,220 |
| Bivigam | 53 | $ 3,843 | $ 2,605 |
| Gammagard | 6,350 | $ 4,061 | $ 4,478 |
| Gammaplex | 188 | $ 4,031 | $ 2,817 |
| Flebogamma | 762 | $ 4,270 | $ 4,135 |
| Privigen | 2,731 | $ 5,424 | $ 7,694 |
| Gammaked | 4,607 | $ 5,025 | $ 5,284 |
| Gamunex-C | 618 | $ 6,524 | $ 12,633 |

*Table D9 – Chronic Medications for Treating Multiple Sclerosis*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Prednisone | 10,674 | $ 5 | $ 34 |
| Prednisolone | 45 | $ 59 | $ 162 |
| Methylprednisolone | 4,238 | $ 76 | $ 168 |
| Interferon Beta-1B | 5,685 | $ 4,107 | $ 1,345 |
| Interferon Beta-1A | 24,425 | $ 4,182 | $ 3,326 |
| Teriflunomide | 1,284 | $ 4,684 | $ 1,241 |
| Glatiramer Acetate | 27,341 | $ 4,698 | $ 6,413 |
| Natalizumab | 4,511 | $ 4,729 | $ 3,900 |
| Peginterferon Beta-1A | 109 | $ 4,923 | $ 1,556 |
| Dimethyl Fumarate | 6,450 | $ 4,995 | $ 1,006 |

*Table D10 – Chronic Medications for Treating Osteoporosis*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Estropipate | 529 | $ 4 | $ 5 |
| Estradiol | 37,794 | $ 49 | $ 74 |
| Bazedoxifene Acetate/ Conjugated Est | 56 | $ 75 | $ 15 |
| Conjugated Estrogens | 12,145 | $ 76 | $ 66 |
| Zoledronic Acid | 9 | $ 709 | $ 302 |
| Denosumab | 1,318 | $ 1,303 | $ 4,375 |
| Teriparatide | 6,467 | $ 1,398 | $ 1,820 |

*Table D11 – Chronic Medications for Treating Psoriasis*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Methoxsalen | 17 | $ 49 | $ 50 |
| Fluocinolone Acetonide | 12 | $ 168 | $ 180 |
| Calcitriol | 10,189 | $ 448 | $ 381 |
| Tazarotene | 2,572 | $ 458 | $ 715 |
| Calcipotriene | 26,189 | $ 486 | $ 417 |
| Betamethasone Dipropionate / Calc | 31,414 | $ 797 | $ 741 |
| Ustekinumab | 3,809 | $ 9,079 | $ 19,833 |

*Table D12 – Chronic Medications for Treating Rheumatoid Arthritis*

| Generic Drug Name | Line Count | Mean Payment | St Dev Payment |
|---|---|---|---|
| Alefacept | 1 | $ - | . |
| Gold Sodium Thiomalate | 6 | $ 6 | $ 9 |
| Sulfasalazine | 30,863 | $ 15 | $ 14 |
| Azathioprine | 12,977 | $ 23 | $ 42 |
| Methotrexate Sodium | 206,767 | $ 32 | $ 162 |
| Leflunomide | 28 | $ 66 | $ 67 |
| Mycophenolic Acid | 20,684 | $ 67 | $ 138 |
| Cyclosporine | 351 | $ 320 | $ 267 |
| Tacrolimus | 3,856 | $ 326 | $ 353 |
| Tofacitinib Citrate | 1,269 | $ 2,001 | $ 3,752 |
| Anakinra | 1,056 | $ 2,095 | $ 2,217 |
| Tocilizumab | 1,767 | $ 2,355 | $ 2,219 |
| Etanercept | 46,440 | $ 2,431 | $ 2,222 |
| Abatacept | 4,040 | $ 2,533 | $ 2,005 |
| Adalimumab | 44,710 | $ 2,846 | $ 4,319 |
| Golimumab | 4,206 | $ 2,908 | $ 4,112 |
| Certolizumab Pegol | 3,101 | $ 2,971 | $ 1,959 |
| Infliximab | 15,489 | $ 4,425 | $ 5,081 |
| Vedolizumab | 21 | $ 8,170 | $ 6,294 |
| Rituximab | 1,687 | $ 10,486 | $ 10,578 |