

Associations between pharmacy channels, adherence to biologic disease-modifying anti-rheumatic drugs and chronic opioid use among patients with inflammatory conditions

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INTRODUCTION

- Inflammatory conditions (IC) are complex chronic diseases often treated with biologic disease-modifying anti-rheumatic drugs (bDMARDs), and patients may utilize opioids as well to manage related long and short-term pain.^{1,2}
- While effective in controlling pain, opioids are associated with misuse, fraud, and abuse.³
- One strategy for opioid minimization is through optimizing treatment of the underlying disease state with adherence support, negating need for opioids to manage flares.⁴
- Research evaluating relationship between pharmacy channel, adherence to bDMARDs, and opioid use is lacking.

OBJECTIVE

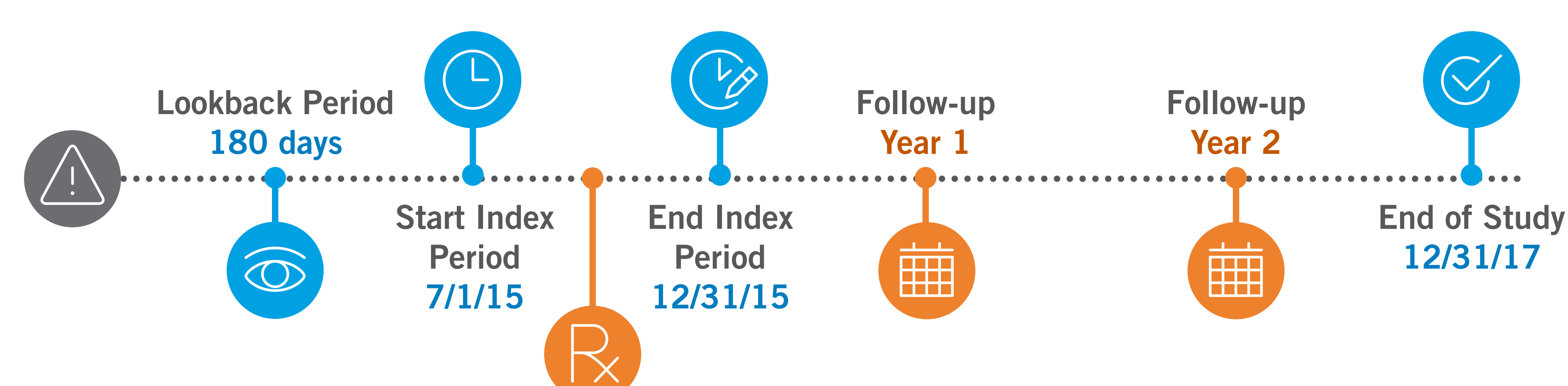
To examine associations between pharmacy channels, bDMARD adherence and chronic opioid use.

METHODS

Study Design and Data Source:

- A retrospective, propensity score matched cohort study using de-identified member enrollment, pharmacy and medical administrative claims from a large national pharmacy benefits manager for 2015-2017.

Exhibit 1: Schematic of Study Timeline



Study Cohort:

- Commercially insured adults and retirees aged 18 or older continuously enrolled from January 1, 2015 to December 31, 2017.
- Filled ≥1 Rx claim for bDMARDs during the index period.
- ≥1 medical claim with diagnosis for ≥1 of the following IC: rheumatoid arthritis, ankylosing spondylitis, Crohn's disease, psoriasis, psoriatic arthritis and ulcerative colitis.
- Patients were assigned to one of three pharmacy channels based on filling ≥75% of their bDMARD Rxs through a single channel during study period: Accredo specialty pharmacy, other specialty pharmacy and retail pharmacy.
- Accredo patients were matched to other specialty pharmacy patients and to retail pharmacy patients using propensity score matching on region, gender and age.

Exclusion Criteria:

- Filled <75% of bDMARDs through all channels
- Diagnosis of cancer during study period

Outcome Measure:

- Adherence to bDMARDs: Measured as medication possession ratio (MPR), or the proportion of duration in the study period during which patients have access to medication. Patients with MPR ≥80% were considered adherent to their bDMARDs.
- Chronic opioid use: ≥90 day supply at any point during the follow-up period stratified by pharmacy channel and adherence to bDMARDs.

Covariates:

- Age (in years) as of index date
- Gender (Men [ref.], Women)
- Region (Northeast [ref.], Midwest, South, West)
- Pre-index bDMARD use (New user [ref.], continuous user)
- Pre-index opioid days' supply
- Pre-index medication adherence, measured as MPR (%)
- Disease burden proxy score (number of unique 2-level generic product identifiers)

Statistical Analysis:

- We used a 2:1 propensity score matching technique to select the final patient cohorts.
- Bivariate analysis was conducted using one-way ANOVA and chi-square test.
- Multivariable logistic regression to examine the odds of chronic opioid use.
- SAS version 9.4 was used for data processing and analyses (SAS Institute, Cary, NC).

RESULTS

- The final 2:1 propensity score matched sample included 1,562 Accredo, 781 other specialty pharmacy and 781 retail pharmacy patients who filled ≥1 bDMARDs during the index period.
- After propensity score matching, measured differences between Accredo, other specialty pharmacy and retail patients were not statistically significant, with the exception of new users whose proportion was lower in the other specialty group compared to the other two (Table 1).

Table 1. Baseline Characteristics for Accredo, Other Specialty Pharmacy and Retail Pharmacy Patients

Characteristic	Accredo (n=1562)		Other Specialty (n=781)		Retail (n=781)		p-value
	Mean or N	SD or %	Mean or N	SD or %	Mean or N	SD or %	
Age (Mean in years)	48.8	11.2	46.5	11.2	46.5	11.7	0.8521
Women	874	56.0%	431	55.2%	436	55.8%	0.9378
Disease burden proxy (GPI-2)	7.5	4.6	7.8	4.7	8.0	4.9	0.1091
New Users	295	18.9%	119	15.2%	159	20.4%	0.0240
Inflammatory Conditions							0.9914
Rheumatoid Arthritis	546	35.0%	277	35.5%	268	34.3%	
Psoriasis	217	13.9%	103	13.2%	110	14.1%	
Ulcerative Colitis	52	3.3%	30	3.8%	25	3.2%	
Crohn's Disease	160	10.2%	89	11.4%	78	10.0%	
Psoriatic Arthritis	73	4.7%	37	4.7%	36	4.6%	
Ankylosing Spondylitis	61	3.9%	33	4.2%	37	4.7%	
Multiple conditions	453	29.0%	212	27.1%	227	29.1%	
Region							0.9796
Northeast	653	41.8%	328	42.0%	319	40.9%	
Midwest	212	13.6%	106	13.6%	99	12.7%	
South	188	12.0%	95	12.2%	102	13.1%	
West	509	32.6%	252	32.3%	261	33.4%	
Opioid Days' Supply Lookback	48.5	92.8	43.1	85.2	45.9	87.7	0.6198

SD: standard deviation
p-values in bold indicate statistical significance at p<0.05

- Overall opioid use (48.8% vs. 48.8% vs. 49.8%, p=0.731) and chronic opioid use (15.9% vs. 16.0% vs. 15.4%, p=0.931) at Accredo, other specialty and retail, respectively, did not differ significantly between pharmacy channels (Table 2).

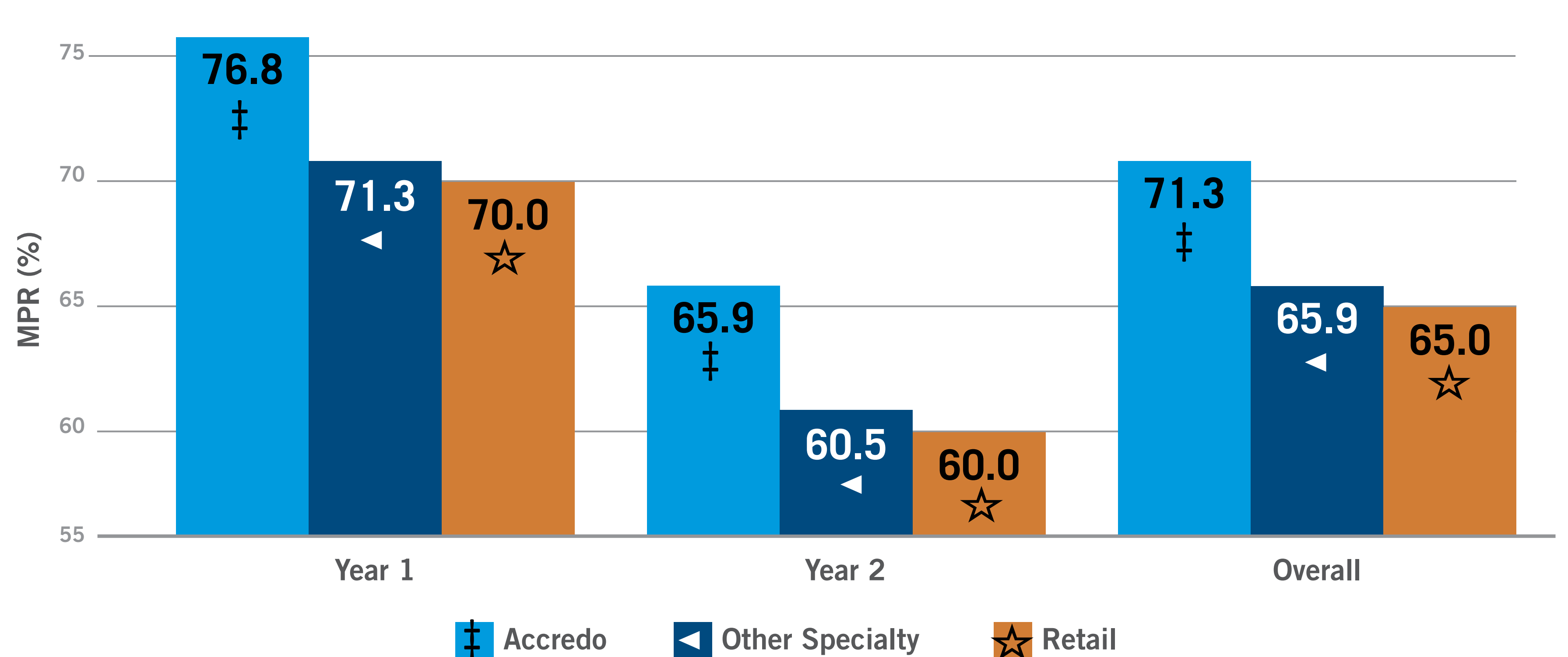
Table 2. Opioid Utilization by Pharmacy Channels

Characteristic	Accredo (n=1562)		Other Specialty (n=781)		Retail (n=781)		p-value
	Mean or N	SD or %	Mean or N	SD or %	Mean or N	SD or %	
Any Opioid Use	751	48.8%	381	48.8%	389	49.8%	0.7310
Chronic Opioid Use*	248	15.9%	125	16.0%	120	15.4%	0.9314

*Greater than or equal to 90 days' supply of opioids over the two-year study period

- Figure 1 displays the difference in adherence to bDMARDs by pharmacy channel.
- Accredo patients had significantly higher adherence to bDMARDs overall compared to other specialty and retail pharmacies (71.3% vs. 65.9% vs. 65.0%, p<0.0001).

Figure 1. Adherence to bDMARDs by pharmacy channel



- Table 3 displays the multivariable analysis results.
- After adjusting for all covariates, chronic opioid use did not differ significantly between Accredo, other specialty pharmacy and retail pharmacy.
- Patients adherent to bDMARDs had a 27% lower odds of chronic opioid use compared to nonadherent patients in this study (odds ratio: 0.73, 95% confidence interval: 0.62 – 0.88).

Table 3. Multivariable Analysis Examining Chronic Opioid Use among Patients using bDMARDs

Variables	Odds Ratio	95% Confidence Limits		p-value
Pharmacy Channel (ref: Accredo)				
Other Specialty Pharmacy	1.023	0.830	1.260	0.8336
Retail Pharmacy	1.022	0.828	1.261	0.8417
Adherence (ref: Non adherent)				
Adherent	0.734	0.615	0.875	0.0006
Drug Utilization (ref: New Users)				
Continuous Users	0.840	0.670	1.052	0.1292
Disease Burden Proxy (GPI-2)	1.256	1.224	1.289	<0.0001
Opioid Days Supply in Lookback Period	1.043	1.034	1.052	<0.0001
Region (ref: Northeast)				
Midwest	1.769	1.355	2.311	<0.0001
South	1.754	1.323	2.327	<0.0001
West	1.627	1.331	1.987	<0.0001
Gender (ref: Men)				
Women	0.785	0.651	0.947	0.0113
Inflammatory Conditions (ref: Rheumatoid Arthritis)				
Multiple Conditions	0.870	0.692	1.094	0.2331
Ankylosing Spondylitis	1.392	0.890	2.176	0.1473
Crohn's Disease	1.377	1.008	1.882	0.0447
Psoriasis	0.961	0.724	1.277	0.7856
Psoriatic Arthritis	0.757	0.490	1.170	0.2103
Ulcerative Colitis	0.716	0.437	1.171	0.1828
Age	1.007	0.998	1.015	0.1200

p-values in bold indicate statistical significance at p<0.05

All regression analyses were adjusted for age, gender, region, disease burden proxy (GPI-2), new user indicator, pre-index opioids days' supply, pre-index adherence, and inflammatory conditions diagnosis.

LIMITATIONS

- The findings are generalizable to commercially insured patients with similar demographic and health characteristics.
- This study did not use patient self-reported data and as a result, unmeasured differences between patients in the three pharmacy channel groups, such as health-seeking behavior were not controlled.
- Our study examines association between adherence to bDMARDs and chronic opioid use and not causation.

CONCLUSION

- Our study demonstrates the positive association between adherence to bDMARDs and chronic opioid use.
- While chronic opioid use did not differ between pharmacy channels, our findings indicate lower chronic opioid use among patients adherent to bDMARDs. Our findings also indicate that Accredo patients have a higher adherence to bDMARDs compared to other pharmacy channels.
- Our findings are important and provide further evidence that specialty pharmacies can play a role in improving adherence to high cost bDMARDs leading to better disease control, thereby lowering need for concomitant opioid use among IC patients.

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