

Slava Kachar, PharmD; Cliff Rutter, PharmD, PhD; Elisea Avalos-Reyes, PhD; Kelly McAuliff, PharmD; Rashmi Grover, PharmD; Lucia Feczko, RPh; Chen Liu, PhD; Dorothea Verbrugge, MD; Kjel Johnson, PharmD

### Background

- Multiple sclerosis (MS) is a chronic, autoimmune, inflammatory disease of the central nervous system
- While there is no cure for MS, oral disease-modifying therapies (DMTs) such as sphingosine-1-phosphate receptor modulators (S1PRMs) offer a practical route of administration, higher efficacy, and better tolerability

### Objective

- To assess if patients prescribed S1PRMs demonstrate higher adherence than those prescribed other oral therapies (OOTs)

### Methods

- This is a retrospective cohort study of Commercial fully insured and Medicare patients from a large national healthcare payor in the United States
- Adult, MS patients prescribed S1PRMs or OOTs from 4/15/21 to 4/15/23 were included
- Patients were excluded if they switched between medication classes, were prescribed cladribine, or had less than 6 months of eligibility
- Medication adherence was calculated using the proportion of days covered (PDC), defined as the sum of days covered by medication/number of eligible days in period
- Optimal adherence was defined as PDC ≥ 0.8
- We conducted a secondary analysis of only newly initiated patients, which were identified as having no prescription claims in the 6 months prior to their initial medication fill in the study period
- We used student's t and chi-square tests to assess for differences between groups
- P-values less than 0.05 were significant.

### Results

- A total of 1,420 patients were included with 528 (37.2%) prescribed an S1PRM
- The average age of the cohort was 47.9 (standard deviation (SD) 11.0) years; 74% (1,053) identified as female
- There were no significant differences in age or gender between those prescribed S1PRMs vs. OOTs (both p>0.05)
- Patients prescribed OOTs were more likely to be newly started on the medication (21.5% vs. 15%; p = 0.003) compared to those prescribed S1PRMs
- There were no significant differences in PDC (98.8% vs. 98.6%; p=0.284) and adherence (88.3% vs. 86.4%; p = 0.363) between patients prescribed S1PRMs and OOTs
- In the secondary analysis of newly initiated patients, results were similar to the primary analysis
- PDCs (98.5% vs. 99.2%, p=0.808) and adherence (91.1% vs. 87.5%, p=0.519) were not significantly different between S1PRM and OOT cohorts in secondary analysis

**Table 1: Primary cohort demographics**

Variable	Overall N=1420	OOT N=892 (62.8)	S1PRM N=528 (37.2)	p-value
Male gender, n (%)	367 (25.8)	219 (24.6)	148 (28)	0.166
Age, mean (SD)	47.9 (11)	48 (11.4)	47.8 (10.5)	0.756
Age, median [Q1,Q3]	48 [40, 56]	48 [40, 56]	48 [41, 55]	0.812
Covered Months, mean (SD)	38.6 (9.8)	38.8 (9.7)	38.2 (9.9)	0.26
Covered Months, median [Q1,Q3]	40 [33, 49]	40 [33, 49]	40 [32, 49]	0.227
New medication start, n (%)	271 (19.1)	192 (21.5)	79 (15)	0.003
MS Visits, mean (SD)	34.4 (45.3)	33.8 (43.5)	35.5 (48.1)	0.518
MS Visits, median [Q1,Q3]	22 [11, 42]	22 [11, 41]	21 [11, 43]	0.738
CMS subregion, n (%)				0.132
East North Central	159 (11.2)	88 (9.9)	71 (13.4)	
East South Central	26 (1.8)	19 (2.1)	7 (1.3)	
Middle Atlantic	316 (22.3)	200 (22.4)	116 (22)	
Mountain	142 (10)	97 (10.9)	45 (8.5)	
New England	88 (6.2)	51 (5.7)	31 (5.9)	
Pacific	154 (10.8)	108 (12.1)	46 (8.7)	
South Atlantic	368 (25.9)	222 (24.9)	146 (27.7)	
West North Central	70 (4.9)	40 (4.5)	30 (5.7)	
West South Central	97 (6.8)	61 (6.8)	36 (6.8)	

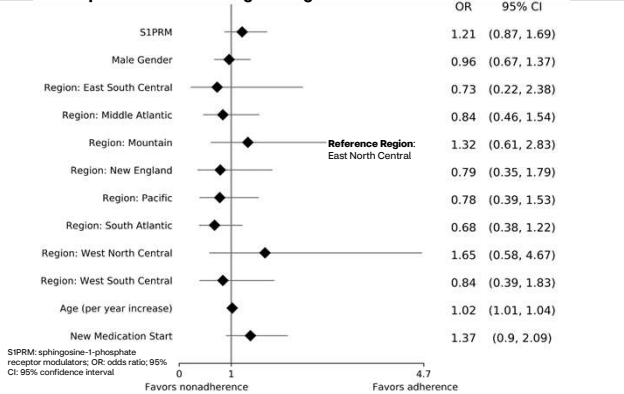
SD, Standard deviation; Q1: First quartile; Q3: Third quartile; OOT: other oral therapy; S1PRM: sphingosine-1-phosphate receptor modulators

**Table 2: Primary cohort adherence results**

Adherence Metric	Overall	OOT	S1PRM	p-value
Days with medication coverage, mean (SD)	377.4 (210.8)	366.5 (211.6)	395.8 (208.1)	0.011
Days with medication coverage, median [Q1,Q3]	[210, 570.3]	[199, 561.3]	[228, 589]	0.01
Eligible coverage days, mean (SD)	411.6 (219)	401.5 (219.7)	428.6 (217)	0.024
Eligible coverage days, median [Q1,Q3]	[235, 621]	[224.5, 615]	[246.8, 630.5]	0.028
PDC, mean (SD)	0.922 (0.135)	0.918 (0.143)	0.930 (0.120)	0.076
PDC, median [Q1,Q3]	0.987 [0.903,1.0]	0.986 [0.899,1.0]	0.989 [0.912,1.0]	0.284
Adherent, n (%)	1237 (87.1)	771 (86.4)	466 (88.3)	0.363

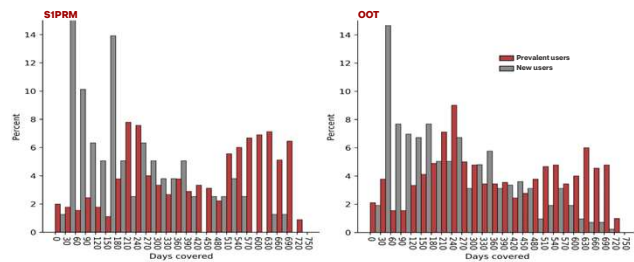
SD, Standard deviation; Q1: First quartile; Q3: Third quartile; OOT: other oral therapy; S1PRM: sphingosine-1-phosphate receptor modulators; PDC: proportion of days covered

**Figure 1: Forest plot for adherence logistic regression**



S1PRM: sphingosine-1-phosphate receptor modulators; OR: odds ratio; 95% CI: 95% confidence interval

**Figure 2: Distributions of days covered stratified by new users and medication class**



**Table 3: Secondary analysis cohort demographics**

Variable	Overall N=271	OOT N=192 (70.8)	S1PRM N=79 (29.2)	p-value
Male gender, n (%)	70 (25.8)	50 (26)	20 (25.3)	1
Age, mean (SD)	44.3 (11.9)	43.6 (12.1)	45.9 (11.3)	0.137
Age, median [Q1,Q3]	44 [36, 52]	43 [35, 51]	46 [37.5, 55]	0.102
Covered Months, mean (SD)	37.1 (10.3)	37.4 (10.5)	36.5 (9.8)	0.523
Covered Months, median [Q1,Q3]	39 [29, 48.5]	40 [29, 49]	37 [28.5, 45]	0.393
MS Visits, mean (SD)	44.2 (48.5)	44.6 (45.7)	43.3 (55.2)	0.853
MS Visits, median [Q1,Q3]	32 [15.5, 55]	35 [17, 57.8]	26 [12.5, 52]	0.196
CMS subregion, n (%)				0.093
East North Central	26 (9.6)	20 (10.4)	6 (7.6)	
East South Central	7 (2.6)	6 (3.1)	1 (1.3)	
Middle Atlantic	62 (22.9)	41 (21.4)	21 (26.6)	
Mountain	23 (8.5)	18 (9.4)	5 (6.3)	
New England	13 (4.8)	10 (5.2)	3 (3.8)	
Pacific	39 (14)	31 (16.1)	7 (8.9)	
South Atlantic	72 (26.6)	45 (23.4)	27 (34.2)	
West North Central	13 (4.8)	6 (3.1)	7 (8.9)	
West South Central	17 (6.3)	15 (7.8)	2 (2.5)	

SD, Standard deviation; Q1: First quartile; Q3: Third quartile; OOT: other oral therapy; S1PRM: sphingosine-1-phosphate receptor modulators

**Table 4: Secondary analysis adherence results**

Adherence Metric	Overall	OOT	S1PRM	p-value
Days with medication coverage, mean (SD)	230.3 (177.9)	233.2 (182.8)	223.1 (166.4)	0.658
Days with medication coverage, median [Q1,Q3]	181 [81.5, 352.5]	185 [70.3, 359.8]	176 [89, 327]	0.969
Eligible coverage days, mean (SD)	254.6 (191.5)	258.3 (194.5)	245.8 (184.8)	0.62
Eligible coverage days, median [Q1,Q3]	211 [84.5, 390]	216.5 [78.3, 402.8]	196 [89, 368.5]	0.817
PDC, mean (SD)	0.924 (0.137)	0.919 (0.145)	0.937 (0.116)	0.269
PDC, median [Q1,Q3]	0.990 [0.912,1.0]	0.992 [0.906,1.0]	0.985 [0.923,1.0]	0.808
Adherent, n (%)	240 (88.6)	168 (87.5)	72 (91.1)	0.519

SD, Standard deviation; Q1: First quartile; Q3: Third quartile; OOT: other oral therapy; S1PRM: sphingosine-1-phosphate receptor modulators; PDC: proportion of days covered

### Conclusions

- No differences in PDC and adherence between patients prescribed S1PRMs and OOTs were found
- Adherence rates were high overall
- Findings were consistent in newly initiated patients