

Online Data Supplement

Effects of GOLD-Adherent Prescribing on COPD Symptom Burden, Exacerbations, and Health Care Utilization in a Real-World Setting

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Table S1. Patient Characteristics by Treatment Group

	GOLD-	GOLD-	GOLD-	GOLD-
	No Treatment	Nonadherent	Nonadherent,	Nonadherent,
Characteristic	(n=1521)	Treatment	Undertreated	Overtreated
				Adherent
				Treatment

	(n=2703)	(n=1158)	(n=1545)	(n=1531)
Resource utilization in 180 days before index date,^a n (%)				
<i>All Cause</i>				
ED visit				
Leading to any	37 (2.4)	46 (1.7)	26 (2.2)	20 (1.3)
hospitalization				
Not leading to	138 (9.1)	144 (5.3)	65 (5.6)	79 (5.1)
any				
hospitalization				
Office visit	1266 (83.2)	2099 (77.7)	887 (76.6)	1212 (78.4)
Other outpatient	1416 (93.1)	2584 (95.6)	1106 (95.5)	1478 (95.7)
visit				
<i>Respiratory - specific</i>				
ED visit				
Leading to any	6 (0.4)	19 (0.7)	12 (1.0)	7 (0.5)

hospitalization					
Not leading to	27 (1.8)	68 (2.5)	37 (3.2)	31 (2.0)	34 (2.2)
any					
hospitalization					
Office visit	427 (28.1)	1409 (52.1)	646 (55.8)	763 (49.4)	720 (47.0)
Other outpatient	403 (26.5)	1414 (52.3)	547 (47.2)	867 (56.1)	838 (54.7)
visit					

ED=emergency department; GOLD=Global initiative for chronic Obstructive Lung Disease

^aFor untreated patients, 180 days before GOLD assignment date

Table S2. Effect of GOLD-Adherent and -Nonadherent Prescribing During 180 Days Following Index Treatment Start

Categorical Variables	GOLD-Adherent, n (%)	GOLD- Nonadherent,^a n (%)	Odds Ratio^b (95% CI)	P Value^c
Exacerbation				
Medication (oral/intravenous steroids + antibiotics) use	164 (10.7)	284 (10.5)	1.02 (0.83 to 1.25)	0.8349
COPD-related ED visit	27 (1.8)	63 (2.3)	0.75 (0.48 to 1.19)	0.2189
COPD-related hospitalization	15 (1.0)	33 (1.2)	0.80 (0.43 to 1.48)	0.4765
HCRU				
<i>All Cause</i>				
ED visit				
Leading to any hospitalization	10 (0.7)	32 (1.2)	0.55 (0.27 to 1.12)	0.0941
Not leading to any hospitalization	50 (3.3)	142 (5.3)	0.61 (0.44 to 0.85)	0.0028
Office visit	1090 (71.2)	1974 (73.0)	0.91 (0.79 to 1.05)	0.1996
Other outpatient visit	1404 (91.7)	2457 (90.9)	1.11 (0.88 to 1.38)	0.3741

Respiratory-specific

ED visit				
Leading to any hospitalization	5 (0.3)	16 (0.6)	0.55 (0.20 to 1.51)	0.2377
Not leading to any hospitalization	30 (2.0)	84 (3.1)	0.62 (0.41 to 0.95)	0.0266
Office visit	610 (39.8)	1125 (41.6)	0.93 (0.82 to 1.06)	0.2586
Other outpatient visit	684 (44.7)	1105 (40.9)	1.17 (1.03 to 1.33)	0.0163
	GOLD-Adherent,	GOLD-Nonadherent,	Mean Difference^d	
Continuous Variables	Mean (SD)	Mean (SD)	(95% CI)	P Value^e
Frequency of Exacerbation				
Medication (oral/intravenous steroids + antibiotics) use	0.14 (0.46)	0.13 (0.43)	0.0093 (−0.019 to 0.037)	0.5161
COPD-related ED visit	0.02 (0.27)	0.03 (0.18)	−0.0021 (−0.017 to 0.013)	0.7860
COPD-related hospitalization	0.01 (0.15)	0.02 (0.16)	−0.0018 (−0.011 to 0.008)	0.7087
Frequency of HCRU				
All Cause				
Hospitalization	0.06 (0.32)	0.08 (0.38)	−0.0222 (−0.044 to −0.001)	0.0424

ED visit	0.06 (0.38)	0.09 (0.40)	-0.0311 (-0.055 to -0.007)	0.0122
Leading to any hospitalization	0.01 (0.09)	0.01 (0.14)	-0.0072 (-0.014 to -0.000)	0.0444
Not leading to any hospitalization	0.05 (0.36)	0.07 (0.34)	-0.0238 (-0.046 to -0.002)	0.0359
Office visit	4.32 (5.85)	4.97 (6.45)	-0.6531 (-0.1034 to -0.272)	0.0008
Other outpatient visit	9.73 (9.66)	9.89 (10.56)	-0.1580 (-0.785 to 0.469)	0.6211
<i>Respiratory-specific</i>				
Hospitalization	0.02 (0.17)	0.02 (0.17)	-0.0018 (-0.012 to 0.009)	0.7354
ED visit	0.03 (0.28)	0.04 (0.24)	-0.0124 (-0.029 to 0.004)	0.1435
Leading to any hospitalization	0.00 (0.06)	0.01 (0.08)	-0.0030 (-0.007 to 0.001)	0.1639
Not leading to any hospitalization	0.03 (0.28)	0.04 (0.24)	-0.0094 (-0.025 to 0.007)	0.2464
Office visit	0.95 (2.18)	0.98 (1.86)	-0.0295 (-0.159 to 0.100)	0.6563
Other outpatient visit	0.89 (1.42)	0.75 (1.28)	0.1366 (0.050 to 0.223)	0.0019

COPD=chronic obstructive pulmonary disease; ED=emergency department; GOLD=Global initiative for chronic Obstructive Lung Disease; HCRU=health care resource utilization

^aCombines undertreated and overtreated patients

^bGOLD-adherent vs nonadherent

^cChi-square test (or Fisher exact test when $\geq 20\%$ of the cells have an expected value < 5)

^d Adherent minus nonadherent.

^e 2-sample t test with unequal variance.

Table S3. Effect of GOLD-Adherent Prescribing Versus Undertreatment During 180 Days Following Index Treatment Start

Categorical Variables	GOLD- Adherent, n (%)	Undertreatment, n (%)	Odds Ratio ^a (95% CI)	P Value ^b
Exacerbation				
Medication (oral/intravenous steroids + antibiotics) use	164 (10.7)	155 (13.4)	0.78 (0.61 to 0.98)	0.0338
COPD-related ED visit	27 (1.8)	27 (2.3)	0.75 (0.44 to 1.29)	0.2984
COPD-related hospitalization	15 (1.0)	9 (0.8)	1.26 (0.55 to 2.90)	0.5803
HCRU				
<i>All Cause</i>				
ED visit				
Leading to any hospitalization	10 (0.7)	20 (1.7)	0.37 (0.17 to 0.80)	0.0087
Not leading to any hospitalization	50 (3.3)	57 (4.9)	0.65 (0.44 to 0.96)	0.0296
Office visit	1090 (71.2)	863 (74.5)	0.84 (0.71 to 1.00)	0.0552
Other outpatient visit	1404 (91.7)	1039 (89.7)	1.27 (0.97 to 1.65)	0.0777

Respiratory-specific

ED visit				
Leading to any hospitalization	5 (0.3)	11 (0.9)	0.34 (0.12 to 0.99)	0.0374
Not leading to any hospitalization	30 (2.0)	35 (3.0)	0.64 (0.39 to 1.05)	0.0756
Office visit	610 (39.8)	547 (47.2)	0.74 (0.63 to 0.86)	0.0001
Other outpatient visit	684 (44.7)	441 (38.1)	1.31 (1.12 to 1.53)	0.0006
<hr/>				
	GOLD-			
	Adherent,	Undertreatment, n	Mean Difference^c	
Continuous Variables	Mean (SD)	(%)	(95% CI)	P Value^d
<hr/>				
Frequency of exacerbation				
Medication (oral/intravenous steroids + antibiotics) use	0.14 (0.46)	0.17 (0.47)	-0.0258 (-0.0613 to 0.0097)	0.1546
COPD-related ED visit	0.02 (0.27)	0.03 (0.18)	-0.0017 (-0.0188 to 0.0153)	0.8415
COPD-related hospitalization	0.01 (0.15)	0.01 (0.15)	0.0025 (-0.0091 to 0.0141)	0.6732

Frequency of HCRU*All Cause*

Hospitalization	0.06 (0.32)	0.09 (0.43)	-0.0345 (-0.0639 to -0.0051)	0.0215
ED visit	0.06 (0.38)	0.09 (0.41)	-0.0308 (-0.0611 to -0.0006)	0.0455
Leading to any hospitalization	0.01 (0.09)	0.02 (0.18)	-0.0144 (-0.0256 to -0.0032)	0.0119
Not leading to any hospitalization	0.05 (0.36)	0.06 (0.32)	-0.0164 (-0.0421 to 0.0092)	0.2095
Office visit	4.32 (5.85)	5.78 (6.90)	-1.4550 (-1.9490 to -0.9610)	0.0000
Other outpatient visit	9.73 (9.66)	10.08 (11.13)	-0.3527 (-1.1563 to 0.4510)	0.3896

Respiratory-specific

Hospitalization	0.02 (0.17)	0.01 (0.17)	0.0016	0.8007
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			(-0.0112 to 0.0145)	
ED visit	0.03 (0.28)	0.04 (0.24)	-0.0146 (-0.0345 to 0.0052)	0.1479
Leading to any hospitalization	0.00 (0.06)	0.01 (0.11)	-0.0071 (-0.0140 to -0.0002)	0.0447
Not leading to any hospitalization	0.03 (0.27)	0.03 (0.20)	-0.0076 (-0.0256 to 0.0105)	0.4119
Office visit	0.95 (2.18)	1.19 (1.99)	-0.2392 (-0.3975 to -0.0809)	0.0031
Other outpatient visit	0.89 (1.42)	0.73 (1.28)	0.1647 (0.0621 to 0.2673)	0.0017

COPD=chronic obstructive pulmonary disease; ED=emergency department; GOLD=Global initiative for chronic Obstructive Lung Disease; HCRU=health care resource utilization

^aGOLD-adherent versus undertreated

^bChi-square test (Fisher exact test is employed when $\geq 20\%$ of the cells have an expected value < 5)

^cGOLD-adherent minus undertreated

^d2-sample *t* test with unequal variance

Table S4. Effect of GOLD-Adherent Prescribing Versus Overtreatment During 180 Days Following Index Treatment Start

Categorical Variables	GOLD- Adherent, n (%)	Overtreatment, n (%)	Odds Ratio^a (95% CI)	P Value^b
Exacerbation				
Medication (oral/intravenous steroids + antibiotics) use	164 (10.7)	129 (8.3)	1.32 (1.03 to 1.68)	0.0256
COPD-related ED visit	27 (1.8)	36 (2.3)	0.75 (0.45 to 1.25)	0.2673
COPD-related hospitalization	15 (1.0)	24 (1.6)	0.63 (0.33 to 1.20)	0.1551
HCRU				
<i>All Cause</i>				
ED visit				
Leading to any hospitalization	10 (0.7)	12 (0.8)	0.84 (0.36 to 1.95)	0.6844
Not leading to any hospitalization	50 (3.3)	85 (5.5)	0.58 (0.41 to 0.83)	0.0025
Office visit	1090 (71.2)	1111 (71.9)	0.97 (0.83 to 1.13)	0.6607
Other outpatient visit	1404 (91.7)	1418 (91.8)	0.99 (0.77 to 1.28)	0.9396

Respiratory-specific

ED visit				
Leading to any hospitalization	5 (0.3)	5 (0.3)	1.01 (0.23 to 4.39)	1.0000
Not leading to any hospitalization	30 (2.0)	49 (3.2)	0.61 (0.39 to 0.97)	0.0336
Office visit	610 (39.8)	578 (37.4)	1.11 (0.96 to 1.28)	0.1660
Other outpatient visit	684 (44.7)	664 (43.0)	1.07 (0.93 to 1.24)	0.3422
<hr/>				
	GOLD-			
	Adherent,	Overtreatment, n	Mean Difference^c	
Continuous Variables	Mean (SD)	(%)	(95% CI)	P Value^d
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Frequency of exacerbation				
Medication (oral/intravenous steroids + antibiotics) use	0.14 (0.46)	0.11 (0.40)	0.0356 (0.0054 to 0.0658)	0.0210
COPD-related ED visit	0.02 (0.27)	0.03 (0.18)	-0.0024 (-0.0186 to 0.0139)	0.7751
COPD-related hospitalization	0.01 (0.15)	0.02 (0.16)	-0.0051 (-0.0160 to 0.0059)	0.3637

Frequency of HCRU*All Cause*

Hospitalization	0.06 (0.32)	0.07 (0.33)	-0.0131 (-0.0362 to 0.0101)	0.2689
ED visit	0.06 (0.38)	0.09 (0.40)	-0.0312 (-0.0587 to -0.0037)	0.0260
Leading to any hospitalization	0.01 (0.09)	0.01 (0.11)	-0.0019 (-0.0089 to 0.0052)	0.6029
Not leading to any hospitalization	0.05 (0.36)	0.08 (0.36)	-0.0293 (-0.0549 to -0.0037)	0.0247
Office visit	4.32 (5.85)	4.37 (6.03)	-0.0521 (-0.4719 to 0.3677)	0.8078
Other outpatient visit	9.73 (9.66)	9.74 (10.11)	-0.0122 (-0.7113 to 0.6870)	0.9728

Respiratory-specific

Hospitalization	0.02 (0.17)	0.02 (0.16)	-0.0044	0.4621
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			(-0.0161 to 0.0073)	
ED visit	0.03 (0.28)	0.04 (0.23)	-0.0107 (-0.0289 to 0.0075)	0.2473
Leading to any hospitalization	0.00 (0.06)	0.00 (0.06)	0.0000 (-0.0040 to 0.0041)	0.9885
Not leading to any hospitalization	0.03 (0.27)	0.04 (0.22)	-0.0108 (-0.0283 to 0.0067)	0.2277
Office visit	0.95 (2.18)	0.82 (1.74)	0.1277 (-0.0119 to 0.2673)	0.0730
Other outpatient visit	0.89 (1.42)	0.78 (1.28)	0.1155 (0.0198 to 0.2112)	0.0180

COPD=chronic obstructive pulmonary disease; ED=emergency department; GOLD=Global initiative for chronic Obstructive Lung Disease; HCRU=health care resource utilization

^aGOLD-adherent versus overtreated

^bChi-square test (Fisher exact test is employed when $\geq 20\%$ of the cells have an expected value < 5)

^cGOLD-adherent minus overtreated

^d2-sample *t* test with unequal variance.