

Appendix Table 1. Complete Characteristics and Outcomes of Patients with AECOPD who were Treated Initially with Quinolones or Macrolides

Characteristic	Initial Antibiotic		p-value
	Quinolone N =13469	Macrolide N =6139	
<b>Antibiotics Received During Hospitalization</b>			
Macrolide	264 (2)	6139 (100)	
Quinolone	13469 (100)	459 (8)	
Cephalosporin	1696 (13)	3579 (59)	<0.001
Tetracycline	231 (2)	75 (2)	0.01
Other Antibiotics	397 (3)	220 (4)	0.02
<b>Age Mean (S.D.)</b>	69.1 (11.4)	68.2 (11.8)	<0.001
<b>Sex</b>			0.36
Male	5447 (40)	2440 (40)	
Female	8022 (60)	3699 (60)	
<b>Race/Ethnic group</b>			<0.001
White	10454 (78)	4758 (78)	
Black	1060 (8)	540 (9)	
Hispanic	463 (3)	144 (2)	
Other	1492 (11)	697 (11)	
<b>Primary diagnosis</b>			<0.001
Obstructive chronic bronchitis w/ acute exacerbation	11650 (87)	5298 (86)	
Chronic obstructive asthma/asthma with COPD	908 (7)	569 (9)	

1				
2				
3				
4	Respiratory Failure	911 (7)	272 (4)	
5				
6				
7	<b>Admissions in the prior year</b>			<0.001
8				
9	0	9846 (73)	4654 (76)	
10				
11	1	1918 (14)	816 (13)	
12				
13	2+	1085 (8)	445 (7)	
14				
15	missing	620 (5)	224 (4)	
16				
17				
18				
19	<b>Admission source</b>			0.003
20				
21	Emergency Room	9536 (71)	4474 (73)	
22				
23	MD Referral	3290 (24)	1396 (23)	
24				
25	HMO/Clinical Referral	200 (2)	89 (2)	
26				
27	Transfer	148 (1)	41 (1)	
28				
29	Court/Unknown	295 (2)	139 (2)	
30				
31				
32				
33	<b>Physician specialty</b>			<0.001
34				
35	Internal Med/Hospitalist	7069 (53)	3321 (54)	
36				
37	Family/General Medicine	3569 (27)	2074 (34)	
38				
39	Pulmonologist	2776 (21)	727 (12)	
40				
41	Critical Care/Intensivist	55 (0)	17 (0)	
42				
43				
44				
45	<b>Insurance status</b>			0.23
46				
47	Managed Care	2939 (22)	1305 (21)	
48				
49	Not managed care	10090 (75)	4607 (75)	
50				
51	Self pay/Uninsured	440 (3)	227 (4)	
52				
53				
54				
55	<b>Tests on hospital day 1 or 2</b>			
56				
57	Arterial Blood Gas	8084 (60)	3377 (55)	<0.001
58				
59				
60				

Brain natriuretic peptide	55 (0)	16 (0)	0.12
Sputum test	1741 (13)	766 (13)	0.39
Pulmonary Function tests	880 (6)	462 (8)	0.01
<b>Medications/Therapies on hospital day 1 or 2</b>			
Short acting bronchodilators	7555 (56)	3242 (53)	<0.001
Long Acting beta-2 agonists	2068 (15)	748 (12)	<0.001
Methylxanthine bronchodilators	3051 (23)	1149 (19)	<0.001
Mucolytic medications	144 (1)	44 (1)	0.02
Chest Physiotherapy	466 (4)	206 (3)	0.73
Steroids			0.04
Intravenous	11148 (83)	4989 (81)	
Oral	772 (6)	376 (6)	
<b>Severity Indicators</b>			
Chronic pulmonary heart disease	890 (7)	401 (7)	0.85
Polycythemia	40 (0)	14 (0)	0.46
Sleep apnea	586 (4)	234 (4)	0.08
Noninvasive Positive Pressure Ventilation	391 (3)	128 (2)	<0.001
Loop Diuretics	4838 (36)	1971 (32)	<0.001
Morphine	551 (4)	255 (4)	0.84
Nutritional supplements	63 (1)	27 (0)	0.91
<b>Hospital Characteristics</b>			
<b>Staffed Beds</b>			<0.001
6-200	3483 (26)	1688 (28)	
201-300	3132 (23)	1198 (20)	
301-500	4265 (32)	2047 (33)	

1				
2				
3	500+	2589 (19)	1206 (20)	
4				
5				
6				
7	<b>Population served</b>			<0.001
8				
9	Urban	11346 (84)	4869 (79)	
10				
11	Rural	2123 (16)	1270 (21)	
12				
13				
14				
15	<b>Hospital Region</b>			<0.001
16				
17	South	8562 (64)	3270 (53)	
18				
19	MidWest	2602 (19)	1444 (24)	
20				
21	Northeast	1163 (9)	871 (14)	
22				
23	West	1142 (9)	554 (9)	
24				
25				
26				
27	<b>Teaching hospital</b>			<0.001
28				
29	No	12090 (90)	5037 (82)	
30				
31	Yes	1379 (10)	1102 (18)	
32				
33				
34				
35	<b>Hospital Authority</b>			<0.001
36				
37	Non-Profit	11867 (88)	5571 (91)	
38				
39	Government	1132 (8)	334 (5)	
40				
41	Profit	230 (2)	85 (1)	
42				
43	Unknown	240 (2)	149 (2)	
44				
45				
46				
47	<b>Comorbidities</b>			
48				
49	Congestive Heart Failure	2673 (20)	1147 (19)	0.06
50				
51	Weight loss	185 (1)	75 (1)	0.42
52				
53	Metastatic cancer	134 (1)	27 (0)	<0.001
54				
55	Depression	1419 (11)	669 (11)	0.45
56				
57	Renal failure	242 (2)	99 (2)	0.38
58				
59				
60				

1				
2				
3	Deficiency Anemias	1155 (9)	476 (8)	0.05
4				
5	Psychoses	456 (3)	182 (3)	0.13
6				
7	Solid tumor w/out metastasis	1487 (11)	586 (10)	0.002
8				
9	Other neurological disorders	677 (5)	314 (5)	0.81
10				
11	Alcohol abuse	349 (3)	173 (3)	0.36
12				
13	Drug abuse	103 (1)	72 (1)	0.007
14				
15	Hypothyroidism	1267 (9)	527 (9)	0.07
16				
17	Peptic ulcer disease x bleeding	329 (2)	160 (3)	0.49
18				
19	Pulmonary circulation disease	8 (0)	2 (0)	0.73
20				
21	Valvular disease	3 (0)	1 (0)	1.00
22				
23	Peripheral vascular disease	821 (6)	312 (5)	0.005
24				
25	Rheumatoid arthritis/collagen vas	302 (2)	115 (2)	0.09
26				
27	Acquired immune deficiency syndrome	8 (0)	9 (0)	0.07
28				
29	Lymphoma	67 (1)	19 (0)	0.08
30				
31	Paralysis	165 (1)	46 (1)	0.003
32				
33	Liver disease	121 (1)	39 (1)	0.06
34				
35	Obesity	957 (7)	435 (7)	0.98
36				
37	Hypertension	5793 (43)	2688 (44)	0.31
38				
39	Chronic blood loss anemia	45 (0)	20 (0)	0.93
40				
41	<b>Diabetes</b>			0.04
42				
43	Without chronic complications	2630 (20)	1127 (18)	
44				
45	With chronic complications	298 (2)	116 (2)	
46				
47				
48				
49	<b>Outcomes</b>			
50				
51	Treatment Failure-Death, Ventilation, or readmission	1090 (8.1)	417 (6.8)	0.002
52	for COPD			
53				
54	Mortality	200 (1.5)	60 (1.0)	0.004
55				
56	Readmitted within 30 days (COPD)	780 (5.8)	318 (5.2)	0.09
57				
58				
59				
60				

Readmitted within 30 days (All cause)		2415 (17.9)	970 (15.8)	<0.001
Admission to ICU >2 days after admission		197 (1.5)	90 (1.5)	0.99
Mechanical ventilation begun $\geq$ day 3		155 (1.2)	50 (0.8)	0.03
Antibiotics for diarrhea		154 (1.1)	31 (0.5)	<0.001
Allergic Reaction		33 (0.3)	16 (0.3)	0.88
<b>Length of Stay</b>	<b>Mean (S.D.)</b>	4.9 (2.6)	4.7 (2.5)	<0.001
	<b>Median</b>	4	4	
<b>Hospital Costs (\$)</b>	<b>Mean (S.D.)</b>	4,317 (2,447)	4,236 (2,396)	0.03
	<b>Median</b>	3,659	3,621	

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Appendix Table 2. Complete Characteristics and Outcomes of the Propensity Matched Subsample

Characteristic	Quinolones	Macrolides	p-value
	N=5610	N =5610	
<b>Antibiotics Received</b>			
Macrolide	119 (2)	5610 (100)	
Quinolone	5610 (100)	424 (8)	
Cephalosporin	726 (13)	3305 (59)	<0.001
Tetracycline	101 (2)	73 (2)	0.06
Other Antibiotics	166 (3)	193 (3)	0.03
<b>Age Mean (S.D.)</b>			
	68.6 (11.7)	68.5 (11.7)	0.58
	<b>Median</b>	70	70
<b>Sex</b>			
			0.85
Male	2207 (39)	2196 (39)	
Female	3403 (61)	3414 (61)	
<b>Race/Ethnic group</b>			
			0.44
White	4359 (78)	4368 (78)	
Black	470 (8)	455 (8)	
Hispanic	157 (3)	134 (2)	
Other	624 (11)	653 (12)	
<b>Primary diagnosis</b>			
			0.78
Obstructive chronic bronchitis w/ acute exacerbation	4884 (87)	4860 (87)	
Chronic obstructive asthma/asthma with COPD	466 (8)	486 (9)	

1				
2				
3				
4	Respiratory Failure	260 (5)	264 (5)	
5				
6				
7	<b>Admissions in the prior year</b>			0.84
8				
9	0	4249 (76)	4231 (75)	
10				
11	1	747 (13)	750 (13)	
12				
13	2+	397 (7)	420 (8)	
14				
15	missing	217 (4)	209 (4)	
16				
17				
18				
19	<b>Admission source</b>			0.92
20				
21	Emergency Room	4058 (72)	4058 (72)	
22				
23	MD Referral	1303 (23)	1309 (23)	
24				
25	HMO/Clinical Referral	80 (1)	77 (1)	
26				
27	Transfer	48 (1)	40 (1)	
28				
29	Court/Unknown	121 (2)	126 (2)	
30				
31				
32				
33	<b>Physician specialty</b>	3032 (54)	3072 (55)	0.84
34				
35	Internal Med/Hospitalist	1824 (33)	1812 (32)	
36				
37	Family/General Medicine	738 (13)	711 (13)	
38				
39	Pulmonologist	16 (0)	15 (0)	
40				
41	Critical Care/Intensivist			
42				
43				
44				
45	<b>Insurance status</b>			0.59
46				
47	Managed Care	1194 (21)	1153 (21)	
48				
49	Not managed care	4228 (75)	4260 (76)	
50				
51	Self pay/Uninsured	188 (3)	197 (4)	
52				
53				
54				
55	<b>Early Tests</b>			
56				
57	Arterial Blood Gas	3195 (57)	3129 (56)	0.22
58				
59				
60				

Brain natriuretic peptide	737 (13)	694 (12)	0.23
Sputum Culture	20 (0)	16 (0)	0.62
Pulmonary Function tests	406 (7)	408 (7)	0.97
<b>Early Medications/Therapies</b>			
Short acting bronchodilators	2969 (53)	2820 (50)	0.005
Long Acting beta-2 agonists	704 (13)	719 (13)	0.69
Methylxanthine bronchodilators	1102 (20)	1093 (20)	0.85
Mucolytic medications	44 (1)	41 (1)	0.83
Chest Physiotherapy	192 (3)	192 (3)	1.00
<b>Steroids</b>			0.68
Intravenous	4547 (81)	4581 (82)	
Oral	334 (6)	330 (6)	
<b>Severity Indicators</b>			
Chronic pulmonary heart disease	337 (6)	368 (7)	0.24
Polycythemia	8 (0)	11 (0)	0.65
Sleep apnea	211 (4)	218 (4)	0.77
Noninvasive Positive Pressure Ventilation	128 (2)	114 (2)	0.40
Loop Diuretics	1884 (34)	1862 (33)	0.67
Morphine	209 (4)	218 (4)	0.69
Nutritional supplements	26 (1)	24 (0)	0.89
<b>Hospital Characteristics</b>			
<b>Staffed Beds</b>			0.71
6-200	1610 (29)	1586 (28)	
201-300	1174 (21)	1154 (21)	
301-500	1809 (32)	1867 (33)	

500+	1017 (18)	1003 (18)	
<b>Population served</b>			0.85
Urban	4450 (80)	4441 (79)	
Rural	1160 (21)	1169 (21)	
<b>Hospital Region</b>			0.65
South	3212 (57)	3160 (56)	
MidWest	1170 (21)	1216 (22)	
Northeast	687 (12)	704 (13)	
West	541 (10)	530 (9)	
<b>Teaching hospital</b>			0.63
No	4896 (87)	4878 (87)	
Yes	714 (13)	732 (13)	
<b>Hospital Authority</b>			0.63
Non-Profit	5077 (91)	5097 (91)	
Government	326 (6)	328 (6)	
Profit	87 (2)	84 (2)	
Unknown	120 (2)	101 (2)	
<b>Comorbidities</b>			
Congestive Heart Failure	1081 (19)	1060 (19)	0.63
Weight loss	68 (1)	67 (1)	1.00
Metastatic cancer	34 (1)	38 (1)	0.72
Depression	598 (11)	603 (11)	0.90
Renal failure	89 (2)	88 (2)	1.00
Deficiency Anemias	426 (8)	432 (8)	0.86

Psychoses	171 (3)	173 (3)	0.96
Solid tumor w/out metastasis	550 (10)	552 (10)	0.97
Other neurological disorders	272 (5)	281 (5)	0.73
Alcohol abuse	125 (2)	136 (2)	0.53
Drug abuse	41 (1)	41 (1)	1.00
Hypothyroidism	481 (9)	482 (9)	1.00
Peptic ulcer disease x bleeding	119 (2)	133 (2)	0.41
Pulmonary circulation disease	5 (0)	2 (0)	0.45
Valvular disease	1 (0)	1 (0)	1.00
Peripheral vascular disease	287 (5)	288 (5)	1.00
Rheumatoid arthritis/collagen vas	119 (2)	109 (2)	0.55
Acquired immune deficiency syndrome	3 (0)	7 (0)	0.34
Lymphoma	17 (0)	15 (0)	0.86
Paralysis	49 (1)	51 (1)	0.92
Liver disease	27 (1)	22 (0)	0.57
Obesity	386 (7)	398 (7)	0.68
Hypertension	2474 (44)	2468 (44)	0.92
Chronic blood loss anemia	14 (0)	11 (0)	0.55
<b>Diabetes</b>			0.45
Without chronic complications	1057 (19)	1066 (19)	
With chronic complications	115 (2)	97 (2)	
<b>Outcomes</b>			
Treatment Failure-Death, Ventilation, or readmission for COPD	432 (7.7)	380 (6.8)	0.06
Mortality	74 (1.3)	54 (1.0)	0.09
Readmitted within 30 days (COPD)	305 (5.4)	290 (5.2)	0.56
Readmitted within 30 days (All cause)	960 (17.1)	877 (15.6)	0.04

Admission to ICU >2 days after admission		82 (1.5)	83 (1.5)	0.94
Mechanical ventilation begun $\geq$ day 3		71 (1.3)	45 (0.8)	0.02
Antibiotics for diarrhea		67 (1.2)	31 (0.6)	<0.001
Allergic Reaction		13 (0.2)	14 (0.3)	1.00
<b>Length of Stay</b>	<b>Mean (S.D.)</b>	4.7 (2.6)	4.7 (2.6)	0.39
	<b>Median</b>	4	4	
<b>Hospital Costs (\$)</b>	<b>Mean (S.D.)</b>	4,240 (2,400)	4,215 (2,376)	0.58
	<b>Median</b>	3,591	3,607	

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