

## Supplementary Online Content

Edelman EJ, Gordon KS, Crothers K, et al. Association of prescribed opioids with increased community-acquired pneumonia among patients with and without HIV. *JAMA Intern Med*. Published online January 7, 2019. doi:10.1001/jamainternmed.2018.6101

**eTable 1.** Prescribed Opioid Characteristics Among Cases and Controls Prescribed Opioids, Overall and Stratified by HIV Status

**eTable 2.** Conditional Logistic Regression for Prescribed Opioids and Community-Acquired Pneumonia Risk

This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1. Prescribed Opioid Characteristics Among Cases and Controls Prescribed Opioids, Overall and Stratified by HIV Status**

Characteristic, n(%)	Overall, N=25,392		Uninfected, n=10,486		PLWH, n=14,906	
	Controls, n=21 146	Cases, n=4246	Controls, n=8710	Cases, n=1776	Controls, n=12 436	Cases, n=2470
<b>Prescription opioid timing<sup>a</sup></b>						
None	16086 (76)	2681 (63)	6412 (74)	1065 (60)	9674 (78)	1616 (65)
past only (61-365 days)	2675 (13)	713 (17)	1107 (13)	305 (17)	1568 (13)	408 (16)
current (5-60 days)	2385 (11)	852 (20)	1191 (14)	406 (23)	1194 (9)	446 (18)
<b>Days supplied, median (IQR)</b>	30 (10, 116)	37 (12, 134)	46 (13, 158)	55 (15, 180)	29 (9, 86)	30 (10, 108)
<b>Average MEDD, median (IQR)<sup>a,b</sup></b>	20 (14, 30)	22 (15, 39)	20 (14, 31)	23 (15, 42)	20 (14, 31)	22 (14, 36)
<b>Prescribed immunosuppressive opioids</b>						
Immunosuppressive <sup>a,b</sup>	1672 (33)	646 (41)	697 (30)	274 (38)	975 (35)	372 (44)
Unknown immunosuppressive properties <sup>a,b</sup>	1321 (26)	354 (23)	737 (32)	183 (26)	584 (21)	171 (20)
No immunosuppressive properties <sup>a,b</sup>	2067 (41)	565 (36)	864 (38)	254 (36)	1203 (44)	311 (36)

Notes: MEDD= morphine equivalent daily dose. a. indicates all comparisons for cases versus controls significant at p<0.05 level, except for comparison between cases and controls for days supplied among uninfected (p=0.11); b. indicates sample restricted to those with at least one opioid prescription in the year prior to index date. P values for comparison between controls and cases.

<b>eTable 2. Conditional Logistic Regression for Prescribed Opioids and Community-Acquired Pneumonia Risk</b>								
	<b>Unadjusted, n=25 392</b>		<b>Adjusted, n=25 392</b>		<b>Uninfected, n=10 486</b>		<b>PLWH, n=14 906</b>	
<b>Characteristic</b>	<b>OR (95% CI)</b>	<b>P Values</b>	<b>OR (95% CI)</b>	<b>P Values</b>	<b>OR (95% CI)</b>	<b>P Values</b>	<b>OR (95% CI)</b>	<b>P Values</b>
<b>Prescribed opioid characteristics</b>								
None (reference)	1	n/a	1	n/a	1	n/a	1	n/a
Past any dose, immunosuppressive	1.80 (1.56, 2.08)	<.001	1.42 (1.21, 1.67)	<.001	1.56 (1.21, 2.01)	<.001	1.34 (1.09, 1.64)	.006
Past any dose, unknown/not immunosuppressive	1.51 (1.34, 1.69)	<.001	1.24 (1.09, 1.40)	.001	1.32 (1.10, 1.59)	.003	1.16 (0.98, 1.37)	.08
Current low dose, immunosuppressive	1.85 (1.50, 2.28)	<.001	1.35 (1.07, 1.70)	.01	0.98 (0.67, 1.43)	.92	1.65 (1.23, 2.22)	.001
Current low dose, unknown/not immunosuppressive	1.66 (1.41, 1.95)	<.001	1.23 (1.03, 1.48)	.02	1.22 (0.95, 1.57)	.12	1.24 (0.95, 1.61)	.11
Current medium dose, immunosuppressive	3.31 (2.61, 4.18)	<.001	2.07 (1.59, 2.71)	<.001	1.76 (1.20, 2.57)	.004	2.33 (1.60, 3.40)	<.001
Current medium dose, unknown/not immunosuppressive	1.82 (1.54, 2.15)	<.001	1.35 (1.13, 1.62)	.001	1.39 (1.07, 1.79)	.01	1.33 (1.03, 1.72)	.03
Current high dose, immunosuppressive	5.11 (4.02, 6.48)	<.001	3.18 (2.44, 4.14)	<.001	3.13 (2.14, 4.57)	<.001	3.26 (2.24, 4.73)	<.001
Current high dose, unknown/not immunosuppressive	2.91 (2.17, 3.90)	<.001	2.07 (1.50, 2.86)	<.001	1.66 (1.06, 2.60)	.03	2.60 (1.62, 4.17)	<.001
<b>Smoking (reference none)</b>			1	n/a	1	n/a	1	n/a
Current			1.73 (1.56, 1.91)	<.001	1.80 (1.54, 2.09)	<.001	1.67 (1.46, 1.91)	<.001
Former			1.19 (1.05, 1.35)	.01	1.16 (0.97, 1.38)	.11	1.21 (1.02, 1.44)	.03
Missing			2.71 (2.26, 3.25)	<.001	2.77 (2.09, 3.69)	<.001	2.63 (2.07, 3.33)	<.001
<b>Diabetes mellitus</b>			1.34 (1.22, 1.47)	<.001	1.38 (1.22, 1.57)	<.001	1.23 (1.07, 1.42)	.004
<b>Chronic obstructive pulmonary disease</b>			1.69 (1.53, 1.88)	<.001	1.61 (1.39, 1.86)	<.001	1.74 (1.50, 2.02)	<.001
<b>Congestive heart failure</b>			2.22 (1.89, 2.62)	<.001	2.10 (1.72, 2.58)	<.001	2.38 (1.81, 3.13)	<.001
<b>Stroke</b>			2.06 (1.68, 2.52)	<.001	2.26 (1.75, 2.92)	<.001	1.75 (1.26, 2.44)	.001
<b>Alcohol-related diagnosis</b>			1.09 (0.97, 1.23)	.13	1.06 (0.88, 1.26)	.56	1.13 (0.97, 1.32)	.13
<b>Drug-related diagnosis</b>			1.21 (1.07, 1.38)	.003	1.35 (1.10, 1.67)	.005	1.13 (0.96, 1.33)	.14
<b>Long-term benzodiazepine receipt</b>			1.12 (0.98, 1.27)	0.09	1.14 (0.95, 1.37)	.15	1.09 (0.91, 1.30)	.37
<b>Flu vaccine</b>			0.78 (0.71, 0.85)	<.001	0.88 (0.77, 1.01)	.06	0.69 (0.61, 0.77)	<.001
<b>Pneumococcal vaccine</b>			0.88 (0.81, 0.95)	.002	1.09 (0.96, 1.24)	.20	0.74 (0.67, 0.83)	<.001
<b>No. of prior pneumonia</b>			2.14 (1.81, 2.53)	<.001	3.47 (2.05, 5.89)	<.001	1.99 (1.66, 2.38)	<.001
<b>Current oral steroids</b>			2.36 (1.90, 2.93)	<.001	2.69 (1.97, 3.66)	<.001	2.13 (1.56, 2.91)	<.001
<b>Prior oral steroids</b>			1.47 (1.26, 1.73)	<.001	1.26 (0.99, 1.60)	.06	1.67 (1.35, 2.07)	<.001

<b>Current inhaled steroids</b>			1.27 (0.98, 1.64)	.07	1.10 (0.79, 1.54)	.58	1.46 (0.97, 2.20)	.07
<b>Prior inhaled steroids</b>			1.70 (1.35, 2.13)	<.001	1.91 (1.42, 2.57)	<.001	1.42 (1.00, 2.03)	.05
<b>VACS index score in 5 point increments</b>			1.15 (1.13, 1.16)	<.001	1.15 (1.12, 1.17)	<.001	1.14 (1.13, 1.16)	<.001