

SUPPLEMENTARY TABLE 1
Significant Individual Binary Characteristics for Patients in Cluster 1 (Pain relief)

Variable type	Variable	Characteristic	N (% out of 207)	P-value	OR	95% CI
Sociodemographic	Education	College/trade school or More than college vs. Elementary or High school	134 (64.7)	0.002	2.68	1.44-4.99
	Health literacy	≥ 14 vs. < 14	123 (59.4)	0.042	1.82	1.02-3.25
	Income	≥ \$10,000 vs. < \$10,000	179 (86.5)	0.032	2.83	1.10-7.32
	Primary insurance	Private or Medicare vs. Medicaid, Other, VA, None, or Multiple or missing	148 (71.5)	0.031	2.04	1.07-3.91
	Race	White (Caucasian) vs. Black (African American)	121 (58.5)	0.011	2.13	1.19-3.80
Illness	Physical health not good (number of days within last 30 days)	≥ 22 vs. < 22	59 (28.5)	0.028	1.99	1.08-3.66
	Presence of chronic kidney disease	No vs. Yes or missing	113 (54.6)	0.043	1.80	1.02-3.17
Pain, function and pain treatment	--					
Analgesic attitudes and barriers	BQ-II item - drowsiness difficult to control	≤ 4 vs. = 5	170 (82.1)	0.030	2.46	1.09-5.52
	BQ-II item - weakens immune system	≤ 3 vs. > 3	176 (85.0)	0.012	3.32	1.30-8.48
	BQ-II item - can harm your immune system	≤ 2 vs. > 2	158 (76.3)	0.010	2.58	1.25-5.32

BQ II item - can keep you from knowing what's going on in your body	≤ 3 vs. > 3	165 (79.7)	0.015	2.60	1.20-5.64
BQ II item - constipation cannot be relieved	≤ 1 vs. > 1	156 (75.4)	0.030	2.15	1.08-4.29
BQ II item - won't work as well if you need it later	≥ 1 vs. < 1	128 (61.8)	0.041	1.85	1.03-3.33
BQ-II item - can mask changes in your health	≤ 3 vs. > 3	158 (76.3)	0.002	3.44	1.60-7.36
BQ-II Analgesic Barriers Total	≤ 72 vs. > 72	130 (62.8)	0.007	2.28	1.25-4.16
BQ-II Harmful Effects Severity	≤ 21 vs. > 21	181 (87.4)	0.004	6.21	1.80-21.4

BQ-II= Barriers Questionnaire; CI=confidence interval; OR=odds ratio; VA=Veterans Administration;

SUPPLEMENTARY TABLE 2
Significant Individual Binary Characteristics for Patients in Cluster 2 (Type of analgesic)

Variable type	Variable	Characteristic	N (% out of 207)	P-value	OR	95% CI
Sociodemographic	Employment status	Retired, Unemployed or Other vs. Employed outside or at home (full or part time)	144 (69.6)	0.029	5.21	1.18-22.9
	Health literacy	= 15 vs. < 15	93 (44.9)	0.015	3.18	1.25-8.09
	Income	≤ \$50,000 vs. < \$50,000	109 (52.7)	0.013	3.68	1.31-10.3
	Primary insurance	Multiple or Other/VA vs. Private, Medicare, Medicaid or missing	31 (15.0)	0.007	3.73	1.43-9.78
	Social support	≤ 4.17 vs. > 4.17	137 (66.2)	0.036	3.82	1.09-13.3
Illness	Charlson Comorbidity Index	≥ 7 vs. < 7	31 (15.0)	0.033	2.92	1.09-7.82
Pain, function and pain treatment	Average pain (last week)	≥ 7 vs. < 7	44 (21.3)	0.031	2.74	1.10-6.83
	Pain relief with medications (last week)	≤ 70% vs. > 70%	105 (50.7)	0.023	3.090	1.17-8.19
Analgesic attitudes and barriers	BQ-II item - drowsiness difficult to control	= 0 vs. > 0	61 (29.5)	0.045	2.46	1.02-5.92
	BQ II item - blocks your ability to know if you have any new pain	= 0 vs. > 0	74 (35.7)	0.032	2.62	1.09-6.32
	BQ-II item - can harm your immune system	≥ 4 vs. < 4	24 (11/6)	0.028	3.26	1.14-9.30
	BQ II item - might not work as well if the pain becomes worse	= 0 vs. > 0	88 (42.5)	0.024	2.85	1.15-7.07
	BQ II item - very addictive	= 5 vs. < 5	54 (26.1)	0.015	3.01	1.24-7.29

BQ II item - can relieve cancer pain	≤ 2 vs. > 2	25 (12.1)	0.036	3.07	1.08-8.71
BQ II item - people will think I'm a complainer	$= 5$ vs. < 5	23 (11.1)	0.021	3.47	1.21-99.7

BQ-II= Barriers Questionnaire; CI=confidence interval; OR=odds ratio; VA=Veterans Administration

SUPPLEMENTARY TABLE 3**Significant Individual Binary Characteristics for Patients in Cluster 3 (Pain relief, type of side-effects and severity of side-effects)**

Variable type	Variable	Characteristic	N (% out of 207)	P-value	OR	95% CI
Sociodemographic	Health literacy	≤ 14 vs. > 14	114 (55.1)	0.019	2.17	1.14-4.12
	Primary insurance	Private, Medicare or Multiple vs. Medicaid, Other/VA or missing	66 (31.9)	0.042	2.11	1.03-4.33
	Marital status	Married vs. Separated, Divorced, Widowed or Never married	110 (53.1)	0.007	2.41	1.27-4.50
	Social support	≥ 1.83 vs. < 1.83	177 (85.5)	0.029	3.95	1.14-13.6
	Social support satisfaction	≥ 6 vs. < 6	140 (67.6)	0.034	2.17	1.06-4.45
Illness	Physical health not good (number of days within last 30 days)	≥ 3 vs. < 3	175 (84.5)	0.047	3.04	1.03-9.10
	Mental health not good (number of days within last 30 days)	≥ 2 vs. < 2	140 (67.6)	0.015	2.49	1.19-5.20
Pain, function and pain treatment	Average pain (last week)	≤ 6 vs. > 6	163 (78.7)	0.004	4.82	1.64-14.2
	Pain-related functional interference score	≤ 35 vs. > 35	103 (49.8)	0.019	2.12	1.13-3.98
	Pain relief with medications (last week)	≥ 80% vs. < 80%	102 (49.3)	0.033	1.97	1.06-3.67
	How often take prescribed pain medication per day	Not every day or 1-4 times vs. > 4 times	169 (81.6)	0.034	2.930	1.08-7.94
	Severity of analgesic side effects (MSEC)	≤ 28 vs. > 28	133 (64.3)	0.003	3.030	1.45-6.31

Analgesic attitudes and barriers	BQ II item - your body becomes used to its effects and pretty soon it won't work anymore	≤ 3 vs. > 3	134 (64.7)	0.023	2.26	1.12-4.54
	BQ II - nausea cannot be relieved	≤ 2 vs. > 2	184 (88.9)	0.048	4.48	1.02-19.8
	BQ II item - it might not work as well if the pain becomes worse	≤ 3 vs. > 3	166 (80.2)	0.019	3.28	1.22-8.85
	BQ II item - it won't work as well if you need it later	≤ 4 vs. > 4	184 (8.9)	0.048	4.48	1.02-19.8
	BQ II item - people will think I'm a complainer	≤ 3 vs. > 3	169 (61.6)	0.034	2.93	1.08-7.94
	BQ-II Physiological Effects Severity	≤ 28 vs. > 28	162 (78.3)	0.047	2.42	1.01-5.80

BQ-II=Barriers Questionnaire; CI=confidence interval; MSEC=Medication Side-effects Checklist; OR=odds ratio;
VA=Veterans Administration

^a Although these binary characteristics have the same sizes and effects, they represent different sets of patients,
which is why the LCV scores are different.

SUPPLEMENTARY TABLE 4
Significant Individual Binary Characteristics for Patients in Cluster 4 (Type of side-effects)

Variable type	Variable	Characteristic	N (% out of 207)	P-value	OR	95% CI
Sociodemographic	Education	Elementary or High school vs. College/trade school or More than college	73 (35.3)	0.039	2.06	1.04-4.07
	Health literacy	≤ 13 vs. > 13	84 (40.6)	0.010	2.47	1.25-4.90
	Race	Black (African American) vs. White (Caucasian)	86 (41.5)	0.035	2.08	1.05-4.10
	Social support	≥ 1.83 vs. < 1.83	177 (85.5)	0.029	3.95	1.14-13.6
Illness	Mental health not good (number of days within last 30 days)	≤ 12 vs. > 12	144 (69.6)	0.027	2.67	1.17-6.38
	Past history of substance abuse	yes vs. no	35 (16.9)	0.034	2.37	1.07-5.28
Pain, function and pain treatment	Pain relief with medications (last week)	≤ 4 vs. > 4	27 (13.0)	0.030	2.62	1.10-6.24
	Hours pain medicine effective	5 or > 12 vs. 0-4	101 (48.8)	0.018	2.33	1.16-4.68
	Severity of analgesic side effects (MSEC)	≥ 40 vs. < 40	37 (17.9)	0.006	2.960	1.36-6.43
Analgesic attitudes and barriers	BQ-II item - drowsiness difficult to control	≥ 3 vs. < 3	88 (42.5)	0.009	2.52	1.27-5.01
	BQ II item - weakens the immune system	≥ 3 vs. < 3	55 (26.6)	0.012	2.47	1.12-5.02
	BQ II item - confusion cannot be controlled	≥ 2 vs. < 2	63 (30.4)	0.004	2.77	1.39-5.55
	BQ II - blocks your ability to know if you have any new pain	≥ 4 vs. < 4	46 (22.2)	0.027	2.30	1.10-4.81

BQ II - important for the doctor to focus on curing illness	≥ 1 vs. < 1	71 (34.3)	0.004	2.78	1.40-5.53
BQ II item - makes you say or do embarrassing things	≥ 3 vs. < 3	33 (15.9)	0.019	2.64	1.17-5.92
BQ II item - can keep you from knowing what's going on in your body	≥ 4 vs. < 4	42 (20.3)	<0.001	4.85	2.30-10.2
BQ II item - can mask changes in your health	≥ 3 vs. < 3	106 (51.2)	0.019	2.34	1.15-4.75
BQ II item - very addictive	≥ 3 vs. < 3	184 (8.9)	0.048	4.48	1.02-19.8
BQ-II Analgesic Barriers Total	≥ 44 vs. < 44	89 (43.0)	<0.001	3.59	1.76-7.32
BQ-II Physiological Effects Severity	≥ 29 vs. < 29	45 (21.7)	<0.001	4.20	2.02-8.75
BQ-II Harmful Effects Severity	≥ 14 vs. < 14	87 (42.0)	0.001	3.32	1.64-6.71

BQ-II=Barriers Questionnaire; CI=confidence interval; MSEC=Medication Side-effects Checklist; OR=odds ratio;
VA=Veterans Administration