

Opioid Utilization Patterns by Home-Based Hospice Patients: A Longitudinal Review

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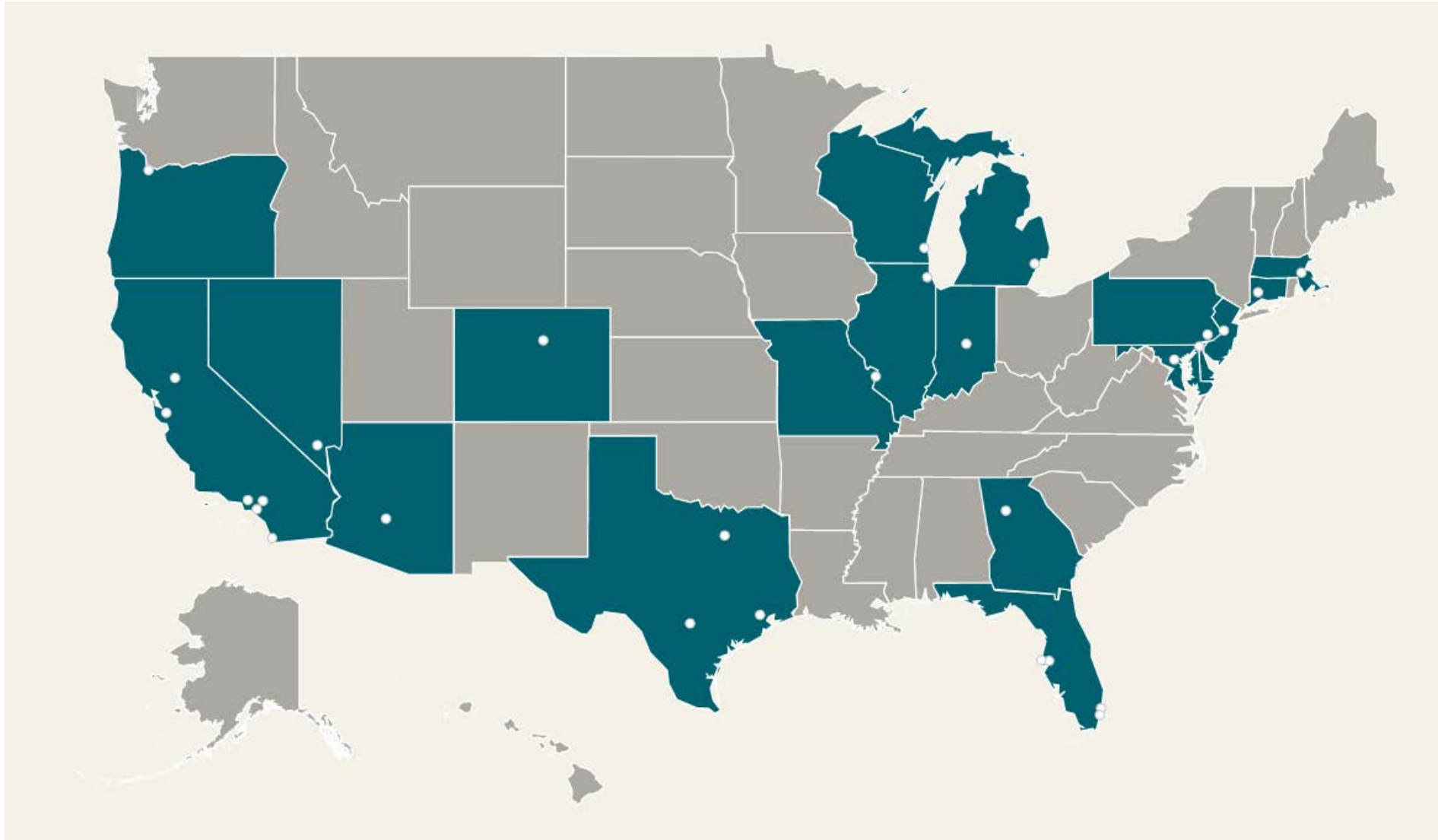
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Seasons Hospice & Palliative Care



Patient Populations Assessed

- Medication use database for all patients admitted after January 1, 2012 and discharged by death by December 31, 2016
- Total of 78,647 patients met these criteria
- Total who received a scheduled non-parenteral opioid was 25,704 patients (32.7% of patients)
 - Excluded patients who only had a “prn” opioid order
 - Excluded patients receiving a parenteral opioid only
 - For combination opioids, only the opioid component was used (e.g., Percocet)
- Average age – 77 years (SD 14)
- Female gender – 57.5%
- Male gender – 42.5%

Race	Number	%
Non-Hispanic white	16,457	63.7
Non-Hispanic black or AA	4,081	15.8
Hispanic/Latino	1,584	6.1
Other	627	2.4
Unknown	3084	11.9

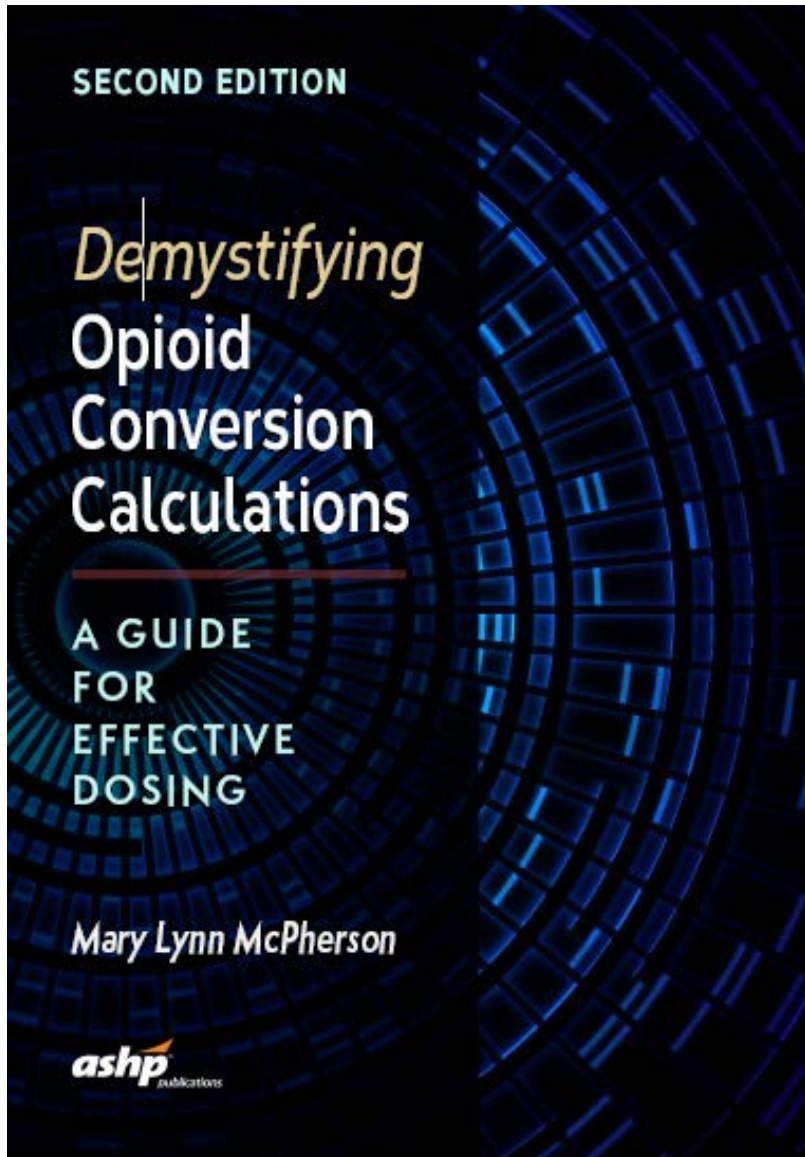
Payer	Number	%
Medicare	18,439	71.4
Medicaid	2,931	11.4
Third-party	3,430	13.3
Other	1,033	4.0

Admitting Diagnosis	Number	%
Cancer	11,814	45.7
Cardiac/Circulatory	4,676	18.1
Dementia	2,658	10.3
Respiratory	1,659	6.4
Infection	1,501	5.8
Stroke	926	3.6
Renal Disease	617	2.4
Debility	670	2.6
Liver Disease	453	1.8
HIV/AIDS	43	0.2
Other	1,916	7.4

Length of stay – 18 days; Median (IQR) – 6-60 days

Categories of Daily Opioid Dosage

Opioid	Regular Doses (mg/day)		Elevated Dose (mg/day)	
	Low	Moderate	High	Very High
Morphine	≤ 59	60-299	300-599	≥ 600



OPIOID CONVERSION CALCULATIONS

It is often necessary to switch from one opioid to a different opioid, a different formulation, or a different route of administration.

STEPS INCLUDE:

1. Assess patient's pain complaint thoroughly; is pain controlled (e.g., at goal)?
2. Determine average total daily dose of current opioid use (long- and short-acting).
3. Set up ratio using equianalgesic equivalence chart; calculate new dose.
4. Individualize calculated dose based on patient assessment in step 1.
 - a. Staying with same opioid, but different route of administration:
 - ▶ pain controlled, use calculated dose
 - ▶ pain not controlled, increase dose (e.g., 20-30%)
 - b. Switching from one opioid to another opioid:
 - ▶ pain controlled, reduce calculated dose by 30-50%
 - ▶ pain not controlled, reduce calculated dose by less (e.g., 10-20%)
5. Monitor patient closely; adjust as needed.

SELECTED EQUIVALENCIES

OPIOID	Equianalgesic Equivalence (mg)	
	PARENTERAL	ORAL
Morphine	10	25
Fentanyl	0.15	NA
Hydrocodone	NA	25
Hydromorphone	2	5
Oxycodone	10 <i>(not in US)</i>	20
Oxymorphone	1	10

Example: Patient receiving long- and short-acting oral oxycodone, on average 80 mg per day. Patient can no longer swallow tablets or capsules; pain is well controlled on this regimen. Switch to oral morphine solution, dosed q4h around the clock.

$$\frac{\text{"x" mg oral morphine}}{80 \text{ mg oral oxycodone}} = \frac{25 \text{ mg oral morphine}}{20 \text{ mg oral oxycodone}}$$

"x" = 100 mg oral morphine
Reduce by 25-50% because switching opioids and pain was controlled, to oral morphine 50-75 mg daily. Ex: morphine 10 mg po q4h.



McPherson ML. Demystifying Opioid Conversion Calculations: A Guide for Effective Dosing, Second Ed. ASHP. © 2018 in press.

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	Low	Moderate	High	Very High
Morphine	≤ 59	60-299	300-599	≥ 600
Hydrocodone	≤ 59	60-299	300-599	≥ 600
Oxycodone	≤ 49	50-249	250-499	≥ 500
Hydromorphone	≤ 11	12-59	60-119	≥ 120
Oxymorphone	≤ 24	25-124	125-249	≥ 250
TD Fentanyl	≤ 25 mcg/h	50-125 mcg/h	150-275 mcg/h	≥ 300 mcg/h

Table 1. Patient characteristics by daily opioid dose category (n = 25,704)					
	Daily Opioid Dosage				
	Not calculated	Low	Moderate	High	Very High
	(n = 2312) n (%)	(n = 12252) n (%)	(n = 10322) n (%)	(n = 510) n (%)	(n = 308) n (%)
Age (y); Mean (SD)	76.1 (15.7)	80.1 (12.9)	73.6 (14.3)	68.4 (14.5)	71.6 (15.4)
Sex					
Female (n = 14756)	1376 (9.3)	7303 (49.5)	5661 (38.4)	267 (1.8)	149 (1.0)
Male (n = 10896)	927 (8.5)	4928 (45.2)	4640 (42.6)	242 (2.2)	161 (1.5)
Race					
Non-hispanic white (n = 16357)	1303 (7.9)	7994 (48.9)	6560 (40.1)	313 (1.9)	187 (1.1)
Non-hispanic black or african american (n = 4071)	460 (11.3)	1896 (46.6)	1600 (39.3)	79 (1.9)	36 (0.9)
Hispanic/Latino (n = 1579)	231 (14.6)	613 (38.8)	677 (42.9)	38 (2.4)	20 (1.3)
Other (n = 627)	38 (6.1)	303 (48.3)	268 (42.7)	12 (1.9)	6 (1.0)
Unknown (n = 3070)	280 (9.1)	1446 (47.1)	1217 (39.6)	68 (2.2)	59 (1.9)
Payer					
Medicare (n = 18341)	1534 (8.4)	9355 (51.0)	6942 (37.9)	294 (1.6)	216 (1.2)
Medicaid (n = 2920)	319 (10.9)	1414 (48.5)	1103 (37.8)	58 (2.0)	26 (0.9)
Third-party (n = 3411)	362 (10.6)	1119 (32.8)	1752 (51.4)	126 (3.7)	52 (1.5)
Other (n = 1032)	97 (9.4)	364 (35.3)	525 (50.9)	32 (3.1)	14 (1.4)
Admitting Diagnosis					
Cancer (n = 11781)	1070 (9.1)	4454 (37.8)	5755 (48.9)	338 (2.9)	164 (1.4)
Cardiac/Circulatory (n = 4652)	428 (9.2)	2631 (56.6)	1505 (32.4)	48 (1.0)	40 (0.9)
Dementia (n = 2647)	290 (11.0)	1591 (60.1)	718 (27.1)	34 (1.3)	14 (0.5)
Respiratory (n = 1639)	113 (6.9)	818 (49.9)	653 (39.8)	23 (1.4)	32 (2.0)
Infection (n = 1486)	114 (7.7)	837 (56.3)	506 (34.1)	13 (0.9)	16 (1.1)
Stroke (n = 914)	54 (5.9)	527 (57.7)	311 (34.0)	14 (1.5)	8 (0.9)
Renal Disease (n = 616)	57 (9.3)	339 (55.0)	201 (32.6)	8 (1.3)	11 (1.8)
Debility (n = 669)	60 (9.0)	411 (61.5)	181 (27.1)	10 (1.5)	6 (0.9)
Liver Disease (n = 451)	46 (10.2)	214 (47.5)	177 (39.3)	7 (1.6)	7 (1.6)
HIV/AIDS (n = 42)	6 (14.0)	19 (45.2)	14 (33.3)	1 (2.4)	2 (4.8)
Other (n = 1906)	179 (9.4)	1022 (53.6)	658 (34.5)	28 (1.5)	19 (1.0)
Length of Hospice Stay (days); Median (IQR)	22 (8-68)	16 (6-60)	18 (6-57)	31 (10-89)	31 (9-82)

Dosage Formulations

Opioid	Tablet or Capsule n (%)	Oral Solution n (%)	Rectal Suppository n (%)
Morphine (21,456 Rx's)	7,949 (37.1)	13,490 (62.9)	17 (0.08)
Oxycodone (3,188 Rx's)	2,885 (90.5)	303 (9.5)	
Hydrocodone (2,771 Rx's)	2,632 (95.0)	138 (5.0)	
Hydromorphone (2,590 Rx's)	694 (26.8)	1,894 (73.0)	2 (0.08)
Tramadol (1,878 Rx's)	1,874 (99.8)	4 (0.2)	
Methadone (4,537 Rx's)	2,035 (44.9)	2,496 (55.0)	6 (0.13)
Oxymorphone (17)	17 (100)		
Codeine	241 (96.4)	9 (3.6)	

TD Fentanyl – (9,755 Rx's)

Of the 46,442 scheduled opioids ordered:

Opioid	Number (%)	Short vs. Long-acting
Morphine	21,456 (46.2%)	Short acting 14,194 (66.2%) Long acting 7,262 (33.6%)
Oxycodone	3,188 (6.8%)	Short acting 1,691 (53.0%) Long acting 1,497 (47.0%)
Hydrocodone	2,771 (5.9%)	Short acting 2,771 (5.9%)
Hydromorphone	2,590 (5.6%)	Short acting 2,590 (5.6%)
Methadone	4,537 (9.7%)	Short acting 4,537 (9.7%) (actually unmodified)
Tramadol	1,878 (4%)	Short acting 1,838 (97.9%) Long acting 40 (2.1%)

Morphine

	Total # Rx's	Low (mg/d)	Moderate (mg/d)	High (mg/d)	Very High (mg/d)
Morphine Total	21,456 (46.2%)	≤ 59	60-299	300-599	≥ 600
Morphine SA	14,194 (66.2%)	8,010 Rx's	5,936 Rx's	253 Rx's	126 Rx's
Morphine LA	7,262 (33.6%)	3,421 Rx's	3,554 Rx's	228 Rx's	59 Rx's

Dosage Range	Number Prescriptions	Mean (SD)	Median (IQR)
Low - ≤ 59 mg/day	11,314	27.0 (10.1)	30 (20-30)
Moderate – 60-299 mg/day	9,482	99.3 (51.6)	80 (60-120)
High – 300-599 mg/day	471	3984.6 (75.2)	360 (300-480)
Very High - ≥ 600 mg/day	179	1,468.3 (2,458.9)	800 (600-1200)

Tablet Strength	Short-Acting (n)	Short-Acting (%)	Long-Acting (n)	Long-Acting (%)
10 mg			62	0.9
15 mg	513	6.5	3,355	42.2
20 mg			99	1.3
30 mg	174	2.2	2,408	30.3
40 mg			7	0.1
45 mg			6	0.1
50 mg			9	0.1
60 mg			980	12.3
75 mg			1	0.01
80 mg			7	0.1
100 mg			261	3.3
120 mg			1	0.01
130 mg			1	0.01
150 mg			1	0.01
200 mg			64	0.8

Oxycodone

	Total # Rx's	Low (mg/d)	Moderate (mg/d)	High (mg/d)	Very High (mg/d)
Oxycodone Total	3,188 (6.8)	≤ 49	50-249	250-499	≥ 500
Oxycodone SA	1,691 (53.0)	1,085	417	273	116
Oxycodone LA	1,497 (47.0)	1,011	457	24	5

Dosage Range	Number Prescriptions	Mean (SD)	Median (IQR)
Low - ≤ 49 mg/day	2,096	22.8 (11.6)	20 (15-30)
Moderate – 50-249 mg/day	874	103.1(51.0)	60 (60-80)
High – 250-499 mg/day	97	363.7 (63.4)	360 (300-400)
Very High - ≥ 500 mg/day	121	680 (202.5)	600 (600-600)

Tablet Strength	Short-Acting (n)	Short-Acting (%)	Long-Acting (n)	Long-Acting (%)
2.5 mg	3	0.1	7	0.2
4.5 mg	1	0	1	0
5 mg	857	29.7	257	8.9
7.5 mg	12	0.4	14	0.5
10 mg	299	10.4	439	15.2
15 mg	66	2.3	69	2.4
20 mg	79	2.7	316	11
30 mg	67	2.3	102	3.5
40 mg	0	0	149	5.2
60 mg	4	0.1	68	2.4
80 mg	0	0	75	2.6

Transdermal Fentanyl (TDF)

	Total # Rx's	Low (mcg/h)	Moderate (mg/d)	High (mg/d)	Very High (mg/d)
TDF Total	9,755	≤ 25	50-125	150-275	≥ 300

Dosage Range	Number Prescriptions	Mean (SD)	Median (IQR)
Low - ≤ 25 mcg/h	5,362	19.7 (6.4)	25 (12-25)
Moderate – 25-125 mg/h	4,393	69.1 (21.4)	50 (50-100)
High – 150-275 mcg/h	0		
Very High - ≥ 300 mcg/h	0		

Tablet Strength	Number Rx's	% TDF Rx's
12 mcg/h	2,182	22.4
25 mcg/h	3,180	32.6
37.5 mcg/h	31	0.3
50 mcg/h	2,183	22.4
62.5 mcg/h	3	0.03
75 mcg/h	980	10.0
100 mcg/h	1,197	12.2

Even though almost 25% of all TDF prescriptions are the higher strengths, ALL TDF prescriptions are in low or moderate dosage range.

Other opioids

- There was no use of long-acting:
 - Hydrocodone
 - Hydromorphone
- Minimal use of long-acting:
 - Oxymorphone (13 Rx's early in 5 year time period)
 - Tramadol (40 prescriptions over 5 year time period)

So what do I think about all this...

- While it's true that the high milligram dosage formulations are not commonly used, for those small number of patients they are necessary.
- Eliminating these dosage formulations would cause a hardship on many levels:
 - Tablet burden (for patient, and double the tablets in circulation)
 - Financial
 - Often the cost per tablet is the same regardless of strength, so having to take double the tablets, doubles the cost
 - Many insurance companies will only allow 60 tablets/month of a q12h dosage formulation, regardless of the prescribed dose vs. tablet strength
 - Options are limited for patients with legitimate pain in these circumstances – what course of action might THEY take?
- Is this REALLY going to solve the opioid crisis?

STATISTICS

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