Supplementary tables:

Supplementary Table 1 Drug code for opioid and nonopioid pain medications

Drug name	Drug code
Opioid pain medication	
Medications to treat opioid addiction	
Methadone	d00050
Buprenorphine	d00840
Naltrexone	d01406
buprenorphine; naloxone	d04819
Weaker than morphine	
acetaminophen; butalbital; caffeine; codeine	d03425
acetaminophen; caffeine; dihydrocodeine	d04269
aspirin; codeine	d03424
acetaminophen; codeine	d03423
acetaminophen; pentazocine	d03682
acetaminophen; propoxyphene	d03434
acetaminophen; tramadol	d04766
anhydrous calcium iodide; codeine	d03630
aspirin; butalbital; caffeine; codeine	d03426
chlorpheniramine; codeine; pseudoephedrine	d03362
aspirin; caffeine; dihydrocodeine	d03430
aspirin; caffeine; propoxyphene	d03435
Opium	d00824
dihydrocodeine; guaifenesin; pseudoephedrine	d04870
Codeine	d00012
codeine; guaifenesin	d03393
codeine; guaifenesin; pseudoephedrine	d03398
codeine; phenylephrine; promethazine	d03364
codeine; promethazine	d03357
Meperidine	d00017
naloxone; pentazocine	d03676
Pentazocine	d00334
Propoxyphene	d00360
Tramadol	d03826
aspirin; carisoprodol; codeine	d03470
chlorpheniramine; dihydrocodeine; phenylephrine	d04904
meperidine; promethazine	d03433
Equivalent to morphine	
acetaminophen; caffeine; chlorpheniramine; hydrocodone; phenylephrine	d03346

acetaminophen; hydrocodone	d03428
aspirin; hydrocodone	d03429
belladonna; opium	d03436
chlorpheniramine; hydrocodone	d03356
chlorpheniramine; hydrocodone; phenylephrine	d03361
chlorpheniramine; hydrocodone; pseudoephedrine	d03416
diphenhydramine; hydrocodone; phenylephrine	d04925
guaifenesin; hydrocodone	d03396
guaifenesin; hydrocodone; pseudoephedrine	d03404
homatropine; hydrocodone	d03340
Hydrocodone	d03075
hydrocodone; ibuprofen	d04225
hydrocodone; phenylephrine; pyrilamine	d03366
hydrocodone; phenylpropanolamine	d03353
hydrocodone; pseudoephedrine; triprolidine	d06669
Morphine	d00308
Tapentadol	d07453
hydrocodone; pseudoephedrine	d03352
hydrocodone; potassium guaiacolsulfonate	d03915
hydrocodone; pheniramine; phenylephrine; phenylpropanolamine; pyrilamine	d03375
guaifenesin; hydrocodone; phenylephrine	d03403
hydrocodone; phenylephrine	d04152
carbinoxamine; hydrocodone; pseudoephedrine	d04752
brompheniramine; hydrocodone; pseudoephedrine	d04880
brompheniramine; hydrocodone; phenylephrine	d05426
dexbrompheniramine; hydrocodone; phenylephrine	d06058
brompheniramine; codeine; phenylpropanolamine	d03367
stronger than morphine	
acetaminophen; oxycodone	d03431
aspirin; oxycodone	d03432
Fentanyl	d00233
Hydromorphone	d00255
Oxycodone	d00329
Oxymorphone	d00833
Nonopioid analgesics	
Aceclofenac	h00025
acetaminophen; butalbital	d03456
acetaminophen; butalbital; caffeine	d03455
acetaminophen; caffeine; isometheptene mucate	d05644

acetaminophen; dextromethorphan; pseudoephedrine	d03342
acetaminophen; dichloralphenazone; isometheptene	d03459
acetaminophen; phenyltoloxamine	d03297
analgesics – unspecified	c00058
Aspirin	d00170
aspirin; butalbital; caffeine	d03457
aspirin; caffeine; orphenadrine	d03472
aspirin; carisoprodol	d03469
aspirin; dipyridamole	d04497
belladonna; ergotamine; phenobarbital	d03495
betamethasone; indomethacin; methocarbamol	h00009
caffeine; ergotamine	d04120
celecoxib	d04380
choline salicylate; magnesium salicylate	d03651
diclofenac	d00848
diclofenac; misoprostol	d04271
diflunisal	d00208
eletriptan	d04849
etodolac	d00851
fenoprofen	d00026
flurbiprofen	d00239
frovatriptan	d04776
ibuprofen	d00015
indomethacin	d00039
ketoprofen	d00028
ketorolac	d00273
meloxicam	d04532
nabumetone	d00310
naproxen	d00019
naratriptan	d04285
nimesulide	h00002
oxaprozin	d00853
piroxicam	d00343
rizatriptan	d04328
rofecoxib	d04433
salsalate	d00842
sulindac	d00033
sumatriptan	d03160
tolmetin	d00054
valdecoxib	d04778

zolmitriptan	d04253
aspirin; pseudoephedrine	d03291
acetaminophen; pseudoephedrine	d03289
acetaminophen; chlorpheniramine; phenylpropanolamine	d03319
acetaminophen; salicylamide	d04333
acetaminophen; chlorpheniramine; phenylephrine; phenyltoloxamine	d06872
acetaminophen; chlorpheniramine; phenylephrine; phenylpropanolamine	h00003
acetaminophen; amantadine; chlorpheniramine	h00026
acetaminophen; naproxen	h00027
amoxapine	d00874
antipyrine; benzocaine otic	d03627
aspirin; pseudoephedrine	d03291
aspirin; butalbital; caffeine	d03457
aspirin; butalbital	d03458
aspirin; methocarbamol	d03468
belladonna; caffeine; ergotamine; pentobarbital	d03461
bromfenac ophthalmic	d05518
carbamazepine	d00058
clomipramine	d00876
desvenlafaxine	d07113
desipramine	d00145
carisoprodol; diclofenac	h00029
diclofenac topical	d04722
dexamethasone; diclofenac; methocarbamol	h00038
doxepin	d00217
naproxen; sumatriptan	d07130
lansoprazole; naproxen	d04913
esomeprazole; naproxen	d07631
fenoprofen	d00026
gabapentin	d03182
famotidine; ibuprofen	d07764
imipramine	d00259
levomilnacipran	d08114
meclofenamate	d00283
mefenamic acid	d00285
nortriptyline	d00144
oxcarbazepine	d04513
phenylbutazone	d00341
pregabalin	d05508

protriptyline	d00875
trimipramine	d00873
venlafaxine	d03181
pentoxifylline	d00336
pilocarpine	d04031

Supplementary Table 2 The most ten prevalent pain medications in the United States, 2001-2018.

Rank	2001-2018	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016	2017-2018
1	ACETAMINOPHEN;HYDROCODONE	CELECOXIB	IBUPROFEN	ACETAMINOPHEN;HYDROCODONE	ACETAMINOPHEN;HYDROCODONE	ACETAMINOPHEN;HYDROCODONE	ACETAMINOPHEN;HYDROCODONE	GABAPENTIN	GABAPENTIN	GABAPENTIN
2	GABAPENTIN	ROFECOXIB	ACETAMINOPHEN;HYDROCODONE	IBUPROFEN	ASPIRIN	ASPIRIN	GABAPENTIN	ACETAMINOPHEN;HYDROCODONE	IBUPROFEN	IBUPROFEN
3	IBUPROFEN	ACETAMINOPHEN;HYDROCODONE	CELECOXIB	CELECOXIB	GABAPENTIN	GABAPENTIN	IBUPROFEN	IBUPROFEN	TRAMADOL	ACETAMINOPHEN;HYDROCODONE
4	TRAMADOL	NAPROXEN	ROFECOXIB	NAPROXEN	NAPROXEN	IBUPROFEN	TRAMADOL	TRAMADOL	ACETAMINOPHEN;HYDROCODONE	MELOXICAM
5	NAPROXEN	ACETAMINOPHEN; PROPOXYPHENE	NAPROXEN	GABAPENTIN	IBUPROFEN	TRAMADOL	NAPROXEN	MELOXICAM	MELOXICAM	TRAMADOL

6	ASPIRIN	IBUPROFEN	ACETAMINOPHEN; PROPOXYPHENE	VENLAFAXINE	TRAMADOL	NAPROXEN	ASPIRIN	NAPROXEN	NAPROXEN	NAPROXEN
7	CELECOXIB	GABAPENTIN	GABAPENTIN	ASPIRIN	CELECOXIB	HYDROCODONE	ACETAMINOPHEN;OXYCODONE	ASPIRIN	ASPIRIN	VENLAFAXINE
8	MELOXICAM	ASPIRIN	VALDECOXIB	ACETAMINOPHEN; PROPOXYPHENE	VENLAFAXINE	MELOXICAM	OXYCODONE	OXYCODONE	VENLAFAXINE	ASPIRIN
9	VENLAFAXINE	ACETAMINOPHEN; OXYCODONE	VENLAFAXINE	TRAMADOL	HYDROCODONE	OXYCODONE(	MELOXICAM	HYDROCODONE	PREGABALIN	DICLOFENAC

10	HYDROCODONE	ACETAMINOPHEN; CODEINE	TRAMADOL	ACETAMINOPHEN; OXYCODONE	ACETAMINOPHEN; PROPOXYPHENE	ACETAMINOPHEN; OXYCODONE	VENLAFAXINE	VENLAFAXINE	HYDROCODONE	PREGABALIN