

**Supplemental Table S1. List of opioid medications**

Medications
GUAIFENESIN/HYDROCODONE BIT
HYDROCODONE BIT
HYDROCODONE BIT/ACETAMINOPHEN
HYDROCODONE BIT/HOMATROPINE
HYDROCODONE TANNATE/CHLOR-TAN
HYDROCODONE/CHLORPHEN POLIS
HYDROCODONE/IBUPROFEN
P-EPD TAN/HYDROCODONE TANNATE
P-EPHED HCL/HYDROCODONE BIT
P-EPHED HCL/HYDROCODONE/BPM
P-EPHED HCL/HYDROCODONE/CP
P-EPHED HCL/HYDROCODONE/TRIPRO
PE/HYDROCODONE/DEXBROMPHENIRMIN
PHENYLEPHRINE HCL/HYDROCODONE
PHENYLEPHRINE/HYDROCODONE/BPM
PHENYLEPHRINE/HYDROCODONE/CP
PHENYLEPHRINE/HYDROCODONE/D-CP
PHENYLEPHRINE/HYDROCODONE/DPHA
PHENYLEPHRINE/HYDROCODONE/PYR
POT GUAIAICO/HYDROCODONE BIT
PPA HCL/HYDROCODONE BIT
IBUPROFEN/OXYCODONE HCL
OXYCODONE HCL
OXYCODONE HCL/ACETAMINOPHEN
OXYCODONE HCL/ASPIRIN
OXYCODONE HCL/OXYCODON TER/ASA
PROPOXYPHENE HCL
PROPOXYPHENE HCL/ACETAMINOPHEN
PROPOXYPHENE HCL/ASA/CAFFEINE
PROPOXYPHENE NAPSYL
PROPOXYPHENE/ACETAMINOPHEN
TRAMADOL HCL
TRAMADOL HCL/ACETAMINOPHEN
ACETAMINOPHEN WITH CODEINE
ASPIRIN/CODEINE PHOSPHATE
BROMPHENIRAMIN/PE/CODEINE PHOS
CHLORPHENIRAMINE/CODEINE PHOS
CODEINE PHOS/CARISOPRODOL/ASA
CODEINE PHOSPHATE
CODEINE SULF
CODEINE/BUTALBIT/ACETAMIN/CAFF
CODEINE/BUTALBITAL/ASA/CAFFEIN
CODEINE/PROMETHAZINE HCL
DIPHENHYDRAMIN/PE/CODEINE PHOS

GUAIFENESIN/CODEINE PHOS  
P-EPHED HCL/CODEINE/GUAIFEN  
MORPHINE SULFATE  
MORPHINE SULFATE/D5W/PF  
MORPHINE SULFATE/NALTREXONE  
MORPHINE SULFATE/PF  
HYDROMORPHONE HCL  
HYDROMORPHONE HCL/PF  
METHADONE HCL  
MEPERIDINE HCL  
MEPERIDINE HCL/PF  
OXYMORPHONE HCL  
BUPRENORPHINE HCL  
BUPRENORPHINE HCL/NALOXONE HCL  
TAPENTADOL HYDROCHLORIDE  
FENTANYL  
FENTANYL CITRATE  
FENTANYL CITRATE/PF

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**Supplemental Table S2. ICD-9-CM codes prescribed to identify cancer- and pain-related hospitalization**

<b>Disease</b>	<b>ICD-9-CM codes</b>	<b>Description</b>
Cancer	140.XX	Malignant neoplasm of lip
	141.XX	Malignant neoplasm of tongue
	142.XX	Malignant neoplasm of major salivary glands
	143.XX	Malignant neoplasm of gum
	144.XX	Malignant neoplasm of floor of mouth
	145.XX	Malignant neoplasm of other and unspecified parts of mouth
	146.XX	Malignant neoplasm of oropharynx
	147.XX	Malignant neoplasm of nasopharynx
	148.XX	Malignant neoplasm of hypopharynx
	149.XX	Malignant neoplasm of other and ill-defined sites within the lip, oral cavity, and pharynx
	150.XX	Malignant neoplasm of esophagus
	151.XX	Malignant neoplasm of stomach
	152.XX	Malignant neoplasm of small intestine, including duodenum
	153.XX	Malignant neoplasm of colon
	154.XX	Malignant neoplasm of rectum, rectosigmoid junction, and anus
	155.XX	Malignant neoplasm of liver and intrahepatic bile ducts
	156.XX	Malignant neoplasm of gallbladder and extrahepatic bile ducts
	157.XX	Malignant neoplasm of pancreas
	158.XX	Malignant neoplasm of retroperitoneum and peritoneum
	159.XX	Malignant neoplasm of other and ill-defined sites within the digestive organs and peritoneum
	160.XX	Malignant neoplasm of nasal cavities, middle ear, and accessory prescriptions
	161.XX	Malignant neoplasm of larynx
	162.XX	Malignant neoplasm of trachea, bronchus, and lung
	163.XX	Malignant neoplasm of pleura
	164.XX	Malignant neoplasm of thymus, heart, and mediastinum
	165.XX	Malignant neoplasm of other and ill-defined sites within the respiratory system and intrathoracic organs
	170.XX	Malignant neoplasm of bone and articular cartilage
	171.XX	Malignant neoplasm of connective and other soft tissue
	172.XX	Malignant melanoma of skin
	173.XX	Other and unspecified malignant neoplasm of skin
	174.XX	Malignant neoplasm of female breast
	175.XX	Malignant neoplasm of male breast
	176.XX	Kaposi's sarcoma
	179.XX	Malignant neoplasm of uterus, part unspecified
180.XX	Malignant neoplasm of cervix uteri	
181.XX	Malignant neoplasm of placenta	
182.XX	Malignant neoplasm of body of uterus	
183.XX	Malignant neoplasm of ovary and other uterine adnexa	
184.XX	Malignant neoplasm of other and unspecified female genital organs	

	185.XX	Malignant neoplasm of prostate
	186.XX	Malignant neoplasm of testis
	187.XX	Malignant neoplasm of penis and other male genital organs
	188.XX	Malignant neoplasm of bladder
	189.XX	Malignant neoplasm of kidney and other and unspecified urinary organs
	190.XX	Malignant neoplasm of eye
	191.XX	Malignant neoplasm of brain
	192.XX	Malignant neoplasm of other and unspecified parts of nervous system
	193.XX	Malignant neoplasm of thyroid gland
	194.XX	Malignant neoplasm of other endocrine glands and related structures
	195.XX	Malignant neoplasm of other and ill-defined sites
	196.XX	Secondary and unspecified malignant neoplasm of lymph nodes
	197.XX	Secondary malignant neoplasm of respiratory and digestive systems
	198.XX	Secondary malignant neoplasm of other specified sites
	199.XX	Malignant neoplasm without specification of site
	200.XX	Lymphosarcoma and reticulosarcoma and other specified malignant tumors of lymphatic tissue
	201.XX	Hodgkin's disease
	202.XX	Other malignant neoplasms of lymphoid and histiocytic tissue
	203.XX	Multiple myeloma and immunoproliferative neoplasms
	204.XX	Lymphoid leukemia
	205.XX	Myeloid leukemia
	206.XX	Monocytic leukemia
	207.XX	Other specified leukemia
	208.XX	Leukemia of unspecified cell type
Pain	307.80	Psychogenic pain, site unspecified
	338.2X	Chronic pain
	338.3X	Neoplasm related pain (acute) (chronic)
	338.4X	Chronic pain syndrome
	388.70	Otalgia, unspecified
	524.62	Arthralgia of temporomandibular joint
	525.9	Unspecified disorder of the teeth and supporting structures
	569.42	Anal or rectal pain
	607.9	Unspecified disorder of penis
	608.9	Unspecified disorder of male genital organs
	611.71	Mastodynia
	625.9	Unspecified symptom associated with female genital organs
	719.4X	Pain in joint
	723.1	Cervicalgia
	724.2	Lumbago
	724.5	Backache, unspecified
	724.6	Other and unspecified disorders of back: disorders of sacrum
	724.79	Other and unspecified disorders of back: disorders of coccyx, other
	729.1	Myalgia and myositis, unspecified
	729.5	Pain in limb
	733.9	Other and unspecified disorders of bone and cartilage
	780.96	Generalized pain

784.0	Headache
784.1	Throat pain
784.92	Jaw pain
786.5	Chest pain
789.0X	Abdominal pain

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X = 0 to 9 inclusive

ICD-9-CM = International Classification of Diseases, Ninth Revision, Clinical Modification

**Supplemental Table S3. ICD-9-CM codes prescribed to identify mental health-related hospitalization**

<b>Mental illness</b>	<b>ICD-9-CM codes</b>
<b>Depression and affective disorders</b>	296.XX, 298.0, 300.4, 301.12, 309.0, 309.1, 311, V79.0
<b>Organic disorders and dementias</b>	290.XX, 293.XX, 294.XX, 310.XX, 331.0, 331.1X, 331.2, 797
<b>Alcohol-related disorders</b>	291.XX, 303.XX, 305.0X, 571.0, 571.1, 571.2, 571.3, 790.3, V11.3, V79.1
<b>Drug disorders not alcohol related</b>	292.XX, 304.XX, 305.XX (excluded 305.0X)
<b>Schizophrenic disorders</b>	295.XX, V11.0
<b>Other psychoses</b>	297.X, 298.X (excluded 298.0), 299.XX
<b>Anxiety and personality disorders</b>	300.XX (excluded 300.4), 301.XX (excluded 301.12), 307.4X, 307.8X, 308.X, 309.81, 312.3X, 316, V11.1, V11.2
<b>Other mental disorders (not psychoses)</b>	278.0X, 302.XX, 306.XX, 307.XX (excluded 307.4X and 307.8X), 309.XX (excluded 309.0, 309.1, 309.81), 312.XX (excluded 312.3X), 313.XX, 314.XX, 315.XX, 317, 318.X, 319, 780.1, 783.0, 783.6, 799.2X, V11.8, V11.9, V15.4X, V40.XX, V66.3, V67.3, V70.1, V70.2, V79.2, V79.3

X = 0 to 9 inclusive.

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