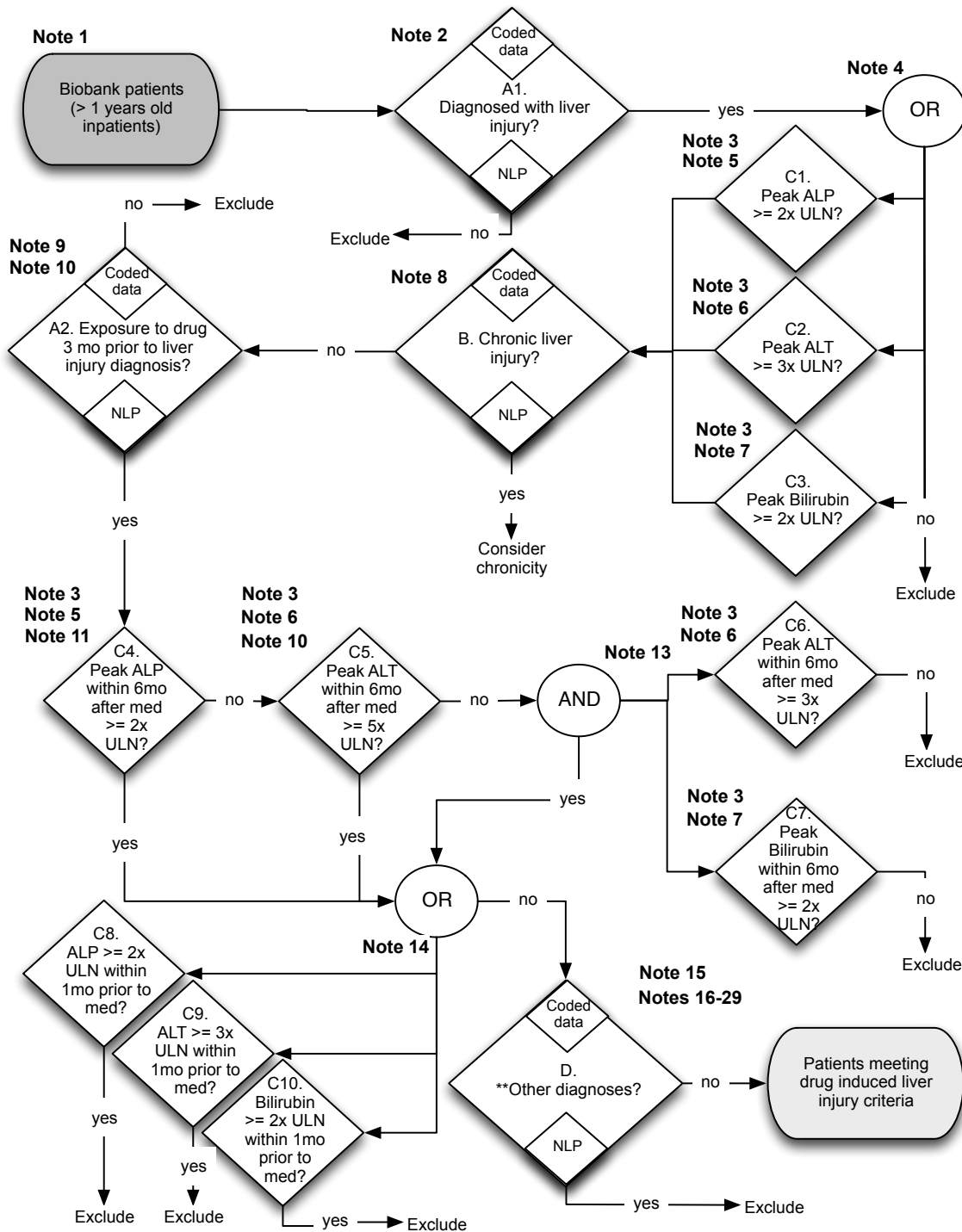


Table of Contents

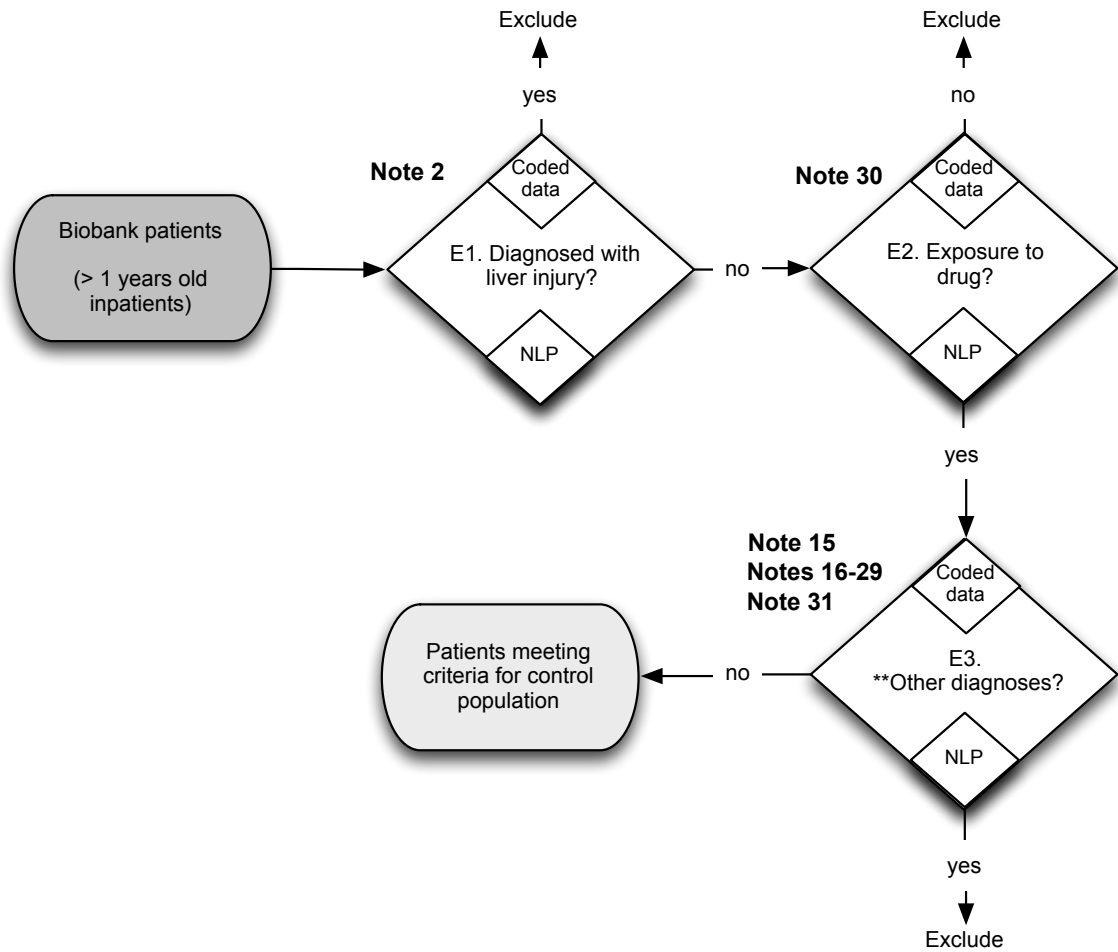
Drug-induced liver injury algorithm - Cases	2
Drug-induced liver injury algorithm - Controls	3
1. Summary of drug-induced liver injury algorithm	4
2. Terminology	4
3. Threshold laboratory values	4
4. Notes.....	5
Appendix 1: Expanded list of medications.....	26

Drug-induced liver injury algorithm - Cases



**Selection of other diagnoses may be institution specific

Drug-induced liver injury algorithm - Controls



**Selection of other diagnoses may be institution specific

1. Summary of drug-induced liver injury algorithm

Inclusion criteria

- A. Suspect DILI? (NOTE: baseline population is institution specific. See institution implementation details)
 - Liver injury AND Exposure to drug (NOTE: medications are institution specific. See institution implementation details)
 - Temporal relationship of exposure to drug and liver injury diagnosis.
 - i. Exposure to drug within 3 months prior to liver injury diagnosis
- B. Acute liver injury?
- C. Does it reach the threshold to qualify as DILI?
 - ALP \geq 2x ULN OR ALT \geq 5x ULN OR (ALT \geq 3xULN AND Bilirubin \geq 2x ULN)
 - Temporal relationship of laboratory measurements and acute liver injury diagnosis.
 - i. Normal laboratory measurements prior to exposure to drug.
 - ii. Laboratory measurements reach threshold for DILI following drug administration.

Exclusion criteria

- D. Patients with other diagnoses (cancer, gallbladder disease, pancreatic disease, heart failure, alcohol abuse/liver damage/toxic effects, HIV infection, rheumatoid arthritis, sarcoidosis, systemic lupus, viral hepatitis, sclerosing cholangitis, chronic liver disease, organ transplantation, liver operation, death, overdose). (NOTE: excluded diagnoses are institution specific. See institution implementation details).

Ref: Aithal, G.P., et al., Case Definition and Phenotype Standardization in Drug-Induced Liver Injury. Clin Pharmacol Ther. 2011 Jun;89(6):806-15.

2. **Terminology**

ULN = Upper limit of normal

ALT = Alanine aminotransferase

ALP = Alkaline phosphatase

3. **Threshold laboratory values**

ALT ULN: 45 U/L (international units/liter)

ALP ULN: 120 U/L (international units/liter)

Bilirubin ULN: 40 μ mol/L (2.34 mg/dL)

Source: International Serious Adverse Events Consortium (iSAEC) DILI study protocol. (NOTE: Use of iSAEC threshold values is institution specific. See institution implementation details.)

4. Notes

Note 1 Baseline population is institution specific. See institution implementation details.

Note 2 Acute liver injury related ICD-9 diagnosis and procedure codes and UMLS CUIs applied in algorithm. Acute liver injury diagnosis is determined by either of the following (also see *Figure 1*):

- a. ICD-9 code for acute liver injury diagnosis.
- b. Acute liver injury related diagnosis mentioned in clinical notes using NLP.
(NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Acute liver injury related diagnoses and procedures	ICD-9 codes	UMLS CUIs
Disorders of bilirubin excretion	277.4	C0012711
Acute and subacute necrosis of the liver	570*	C0162557, C0267796, C0001364
Hepatic coma (hepatorenal syndrome)	572.2	C0019147
Hepatorenal syndrome	572.4*	C0019212
Other disorders of the liver, including chemical or drug induced	573*	C0489954, C0153089, C0153081, C0153085, C0042722, C0153075, C0375004, C0375000, C0375001, C0375005, C0375008, C0153083, C0153084, C0001364, C0162557, C0267796, C0023896, C0015696, C0001306, C0023891, C0687718, C0019189, C0149519, C0029545, C0520463, C0019189, C0008827, C0400945, C0023892, C0008312, C0029546, C0400966, C0023885, C0156192, C0034192, C0267820, C0156193, C0019147, C0019151, C0020541, C0019212, C0156195, C0019158, C0267826, C0156196, C0156197, C0151731, C0156198, C0019196, C0375010, C0375011, C0153088, C0015695, C0400911, C0375006, C0375002, C0375007, C0375003, C0375007, C0375009, C0375012, C0023895
Other specified disorders of biliary tract	576.8	C0005424
Jaundice, unspecified, not of newborn	782.4	C0476232
Hepatomegaly	789.1*	C0019209
Nonspecific elevation of transaminase or lactic dehydrogenase levels	790.4*	C0159071
Abnormal liver function test results	794.8*	C0476389, C0476391, C0159099, C0159100, C0476393, C0159102, C0476396, C0159104, C0159105, C0159106, C0159107, C0159108, C0159109, C0159110, C0476405, C0476406, C0558797, C0476409, C0236140, C0159114, C0476411, C0476412, C0476413, C0236151, C0236151, C0476414, C0476415, C0476416, C0159117, C0159118, C0476418, C0151766, C0476419, C0159120

* reflects extra digits, covering any subcategory of that code.

Ref: Ryan, P., et al., *Observational Medical Outcomes Partnership Health Outcomes of Definitions*, in *Observational Medical Outcomes Partnership*. 2009.

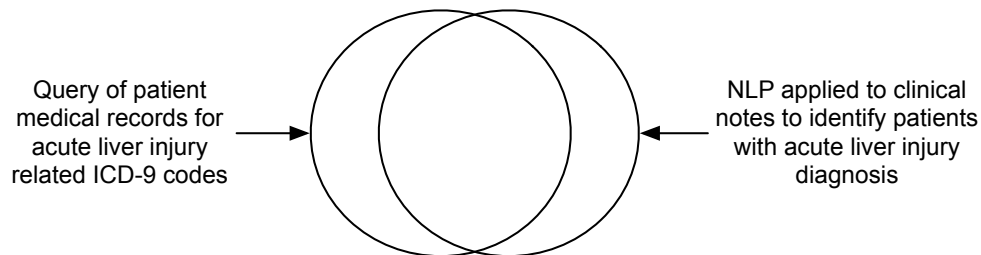


Figure 1. The union of results from two methods to identify patients with acute liver injury. One approach uses structured data (e.g., ICD-9 codes) and the other approach uses NLP applied to clinical notes. (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Note 3 Assess total ALP, ALT and Bilirubin laboratory values.

Note 4 For A1-Yes patients, we evaluate whether patients have peak ALP $\geq 2x$ ULN OR peak ALT $\geq 3x$ ULN OR peak Bilirubin $\geq 2x$ ULN above threshold (for ULN values See Threshold laboratory values). We exclude patients that do not satisfy any of these criteria.

Note 5 Include laboratory values associated with alkaline phosphatase (ALP) tests.

ALP tests	UMLS CUI
Intestinal alkaline phosphatase measurement	C0201853

Note 6 Include laboratory values associated with alanine aminotransferase (ALT) tests.

ALT tests	UMLS CUI
Alanine Aminotransferase Measurement	C0201836

Note 7 Include laboratory values associated with intravascular bilirubin tests.

Intravascular Bilirubin tests	UMLS CUI
Serum bilirubin indirect	C0036808

Note 8 For C1/C2/C3-Yes patients, we should consider chronicity for patients with any liver injury diagnosis. Chronic liver injury diagnosis is determined by either of the following:

- a. ICD-9 code for chronic liver injury diagnosis.
- b. Chronic liver injury related diagnosis mentioned in clinical notes using NLP. (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Chronic liver disease diagnosis description	ICD-9 code
Alcoholic fatty liver	571.0
Chronic hepatitis	571.4
Chronic hepatitis, unspecified	571.40
Chronic persistent hepatitis	571.41
Other chronic hepatitis	571.49
Cirrhosis of liver without mention of alcohol	571.5
Biliary cirrhosis	571.6
Other chronic nonalcoholic liver disease	571.8
Autoimmune hepatitis	571.42
Unspecified Chronic Liver Disease without Mention of Alcohol	571.9

Note 9 For B-No patients, we exclude patients that were not *administered* (started on) a medication (see Note 10 for a list of medication preparations) within 3 months before the A1 diagnosis. Date of administration is estimated by both of the following (also see *Figure 2*):

- a. Date a new medication is ordered.
- b. Date medication is mentioned in clinical note using NLP. (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

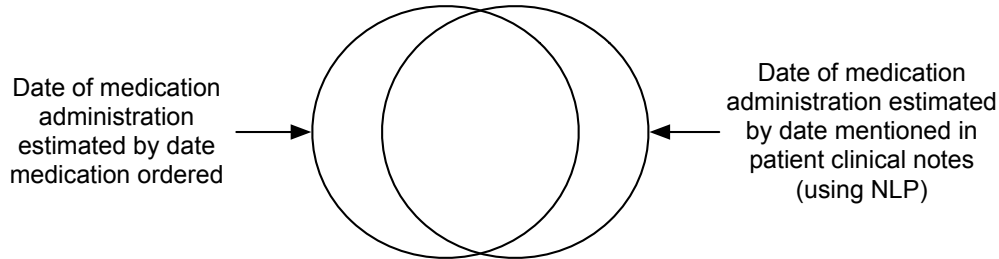


Figure 2. The union of results from two methods to determine whether date of medication administration is within 3 months before acute liver injury diagnosis. One approach uses structured data (e.g., institution specific codes for medications) and the other approach uses NLP applied to clinical notes. (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Note 10 Consider any of the following medication preparations: ciprofloxacin, clinafloxacin, levofloxacin, moxifloxacin, norfloxacin, ofloxacin, sparfloxacin, trovafloxacin, isoniazid, phenytoin, amoxicillin, valproic acid, nitrofurantoin, trimethoprim, minocycline.

Preparations	UMLS CUIs
Ciprofloxacin Preparations	C0282104
Clinafloxacin Preparations	C0070191
Levofloxacin Preparations	C0282386
Minocycline	C0026187
Moxifloxacin Preparations	C0536495
Norfloxacin Preparations	C0699473
Ofloxacin Preparations	C0699173
Sparfloxacin	C0052585
Trovafloxacin Preparations	C0379881
Isoniazid Preparations	C0022209
Phenytoin Preparations	C0305916
Amoxicillin Preparations	C0041058
Valproic Acid Preparations	C0304356
Nitrofurantoin Preparations	C0700187
Trimethoprim Preparations	C0041041

*Source of medications: Drug Induced Liver Injury Network (DILIN) study protocol. (NOTE: Selection of medications is site specific. Sites may select from common medications associated with liver toxicity e.g., See **Appendix 1** for an expanded list of medications from LiverTox.nih.gov [02/11/2013], or consider any medication order. See institution implementation details).*

Note 11 For A2-Yes patients, we evaluate if peak ALP level within 6 months after medication administration $\geq 2x$ ULN (for ULN values See Threshold laboratory values).

Note 12 For C4-No patients, we evaluate whether patients have peak ALT within 6 months after medication administration $\geq 5x$ ULN (for ULN values See Threshold

laboratory values).

Note 13 For C5-No patients, we evaluate whether patients have peak ALT within 6 months after medication administration $\geq 3x$ ULN AND have Bilirubin within 6 months after medication administration $\geq 2x$ ULN (for ULN values See Threshold laboratory values). We exclude patients that do not satisfy both requirements.

Note 14 For C4, C5, C6/C7-Yes patients, we evaluate whether patient lab values were elevated within 1 month prior to medication administration (ALP $\geq 2x$ ULN OR ALT $\geq 3x$ ULN OR Bilirubin $\geq 2x$ ULN; for ULN values see Threshold laboratory values). We exclude patients that satisfy any of these criteria.

Note 15 For C8/C9/C10-No patients and E2-Yes patients, we evaluate whether patients had any the following other diagnoses: primary sclerosing cholangitis, chronic liver disease, allogeneic bone marrow transplantation, cancer, gallbladder disease, pancreatic disease, heart failure, alcohol abuse/liver damage/toxic effects, HIV infection, rheumatoid arthritis, sarcoidosis, systemic lupus, inflammatory bowel disease, viral hepatitis, sclerosing cholangitis, chronic liver disease, organ transplantation, liver operation, death, or overdose. Other diagnoses are determined by either of the following (also see *Figure 3*):

- a. ICD-9 code for other diagnoses.
- b. Other diagnosis mentioned in clinical note using NLP. (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Source of other diagnoses: International Serious Adverse Events Consortium (iSAEC) study protocol. (NOTE: Selection of other diagnoses is institution specific. See institution implementation details).

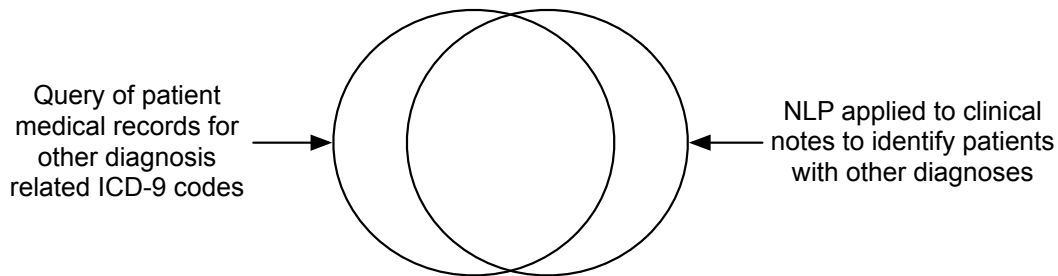


Figure 3. The union of results from two methods to identify patients with other diagnoses. One approach uses structured data (e.g., ICD-9 codes) and the other approach uses NLP applied to clinical notes. (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Note 16 Include all diagnoses associated with cancer (755 terms)

Cancer Descriptions	ICD-9 codes
Nevus, Non-Neoplastic	448.1
Carcinoid Syndrome	259.2
Malignant Neoplasm	199.1
Disseminated Malignant Neoplasm	199.0
Malignant Neoplasm Of Ill-Defined Sites Within The Lip And Oral Cavity	149.9
Mal Neo Lip/Vermil	140.9
Mal Neo Upper Vermilion	140.0
Mal Neo Lower Vermilion	140.1
Mal Neo Lip, Inner	140.5
Mal Neo Upper Lip, Inner	140.3

Cancer Descriptions	ICD-9 codes
Mal Neo Lower Lip, Inner	140.4
Malignant Neoplasm Of Commissure Of Lip	140.6
Malignant Neoplasm Of Other Sites Of Lip	140.8
Malignant Neoplasm Of Tongue, Unspecified	141.9
Malignant Neoplasm Of Base Of Tongue	141.0
Malignant Neoplasm Of Dorsal Surface Of Tongue	141.1
Mal Neo Tip/Lat Tongue	141.2
Mal Neo Ventral Tongue	141.3
Malignant Neoplasm Of Anterior Two-Thirds Of Tongue, Part Unspecified	141.4
Mal Neo Tongue Junction	141.5
Malignant Neoplasm Of Lingual Tonsil	141.6
Malignant Neoplasm Of Other Sites Of Tongue	141.8
Malignant Neoplasm Of Salivary Gland, Unspecified	142.9
Malignant Neoplasm Of Parotid Gland	142.0
Malignant Neoplasm Of Submandibular Gland	142.1
Malignant Neoplasm Of Sublingual Gland	142.2
Malignant Neoplasm Of Other Major Salivary Glands	142.8
Malignant Neoplasm Of Gum, Unspecified	143.9
Malignant Neoplasm Of Upper Gum	143.0
Malignant Neoplasm Of Lower Gum	143.1
Malignant Neoplasm Of Other Sites Of Gum	143.8
Malignant Neoplasm Of Mouth, Unspecified	145.9
Malignant Neoplasm Of Cheek Mucosa	145.0
Mal Neo Mouth Vestibule	145.1
Malignant Neoplasm Of Palate, Unspecified	145.5
Malignant Neoplasm Of Hard Palate	145.2
Malignant Neoplasm Of Soft Palate	145.3
Malignant Neoplasm Of Uvula	145.4
Malignant Neoplasm Of Retromolar Area	145.6
Malig Neoplasm Mouth Other	145.8
Malignant Neoplasm Of Floor Of Mouth, Part Unspecified	144.9
Malignant Neoplasm Of Anterior Portion Of Floor Of Mouth	144.0
Malignant Neoplasm Of Lateral Portion Of Floor Of Mouth	144.1
Malignant Neoplasm Of Other Sites Of Floor Of Mouth	144.8
Mal Neo Pharynx	149.0
Malignant Neoplasm Of Oropharynx, Unspecified	146.9
Malignant Neopl Tonsil	146.0
Mal Neo Tonsillar Fossa	146.1
Malignant Neoplasm Of Tonsillar Pillars (Anterior) (Posterior)	146.2
Malignant Neoplasm Of Vallecula	146.3
Malignant Neoplasm Of Anterior Aspect Of Epiglottis	146.4
Malignant Neoplasm Of Junctional Region Of Oropharynx	146.5
Malignant Neoplasm Of Lateral Wall Of Oropharynx	146.6
Malignant Neoplasm Of Posterior Wall Of Oropharynx	146.7
Mal Neo Oropharynx Other	146.8
Malignant Neoplasm Of Nasopharynx, Unspecified	147.9
Malignant Neoplasm Of Superior Wall Of Nasopharynx	147.0
Mal Neo Post Nasopharynx	147.1
Mal Neo Lat Nasopharynx	147.2
Mal Neo Ant Nasopharynx	147.3
Mal Neo Nasopharynx Other	147.8
Malignant Neoplasm Of Hypopharynx, Unspecified	148.9
Malignant Neoplasm Of Postcricoid Region Of Hypopharynx	148.0
Malignant Neoplasm Of Pyriform Sinus	148.1
Malignant Neoplasm Of Aryepiglottic Fold, Hypopharyngeal Aspect	148.2
Malignant Neoplasm Of Posterior Hypopharyngeal Wall	148.3
Malignant Neoplasm Of Other Specified Sites Of Hypopharynx	148.8
Malignant Neoplasm Of Waldeyer's Ring	149.1

Cancer Descriptions	ICD-9 codes
Malignant Neoplasm Of Other Sites Within The Lip And Oral Cavity	149.8
Malignant Neoplasm Of Digestive System And Intra-Abdominal Organs	159.9
Malignant Neoplasm Of Esophagus, Unspecified	150.9
Malignant Neoplasm Of Cervical Esophagus	150.0
Malignant Neoplasm Of Thoracic Esophagus	150.1
Malignant Neoplasm Of Abdominal Esophagus	150.2
Malignant Neoplasm Of Upper Third Of Esophagus	150.3
Malignant Neoplasm Of Middle Third Of Esophagus	150.4
Malignant Neoplasm Of Lower Third Of Esophagus	150.5
Malignant Neoplasm Of Other Specified Part Of Esophagus	150.8
Malignant Neoplasm Of Stomach, Unspecified	151.9
Malignant Neoplasm Of Cardia	151.0
Malignant Neoplasm Of Pylorus	151.1
Malignant Neoplasm Of Pyloric Antrum	151.2
Malignant Neoplasm Of Fundus Of Stomach	151.3
Malignant Neoplasm Of Body Of Stomach	151.4
Malignant Neoplasm Of Lesser Curvature Of Stomach, Unspecified	151.5
Malignant Neoplasm Of Greater Curvature Of Stomach, Unspecified	151.6
Malig Neopl Stomach Other	151.8
Malignant Neoplasm Of Intestinal Tract, Part Unspecified	159.0
Malignant Neoplasm Of Small Intestine, Unspecified	152.9
Malignant Neoplasm Of Duodenum	152.0
Malignant Neoplasm Of Jejunum	152.1
Malignant Neoplasm Of Ileum	152.2
Malignant Neoplasm Of Meckel's Diverticulum	152.3
Mal Neo Small Bowel Other	152.8
Malignant Neoplasm Of Colon, Unspecified	153.9
Malignant Neoplasm Of Hepatic Flexure	153.0
Malignant Neoplasm Of Transverse Colon	153.1
Malignant Neoplasm Of Descending Colon	153.2
Malignant Neoplasm Of Sigmoid Colon	153.3
Malignant Neoplasm Of Cecum	153.4
Malignant Neoplasm Of Appendix Vermiformis	153.5
Malignant Neoplasm Of Ascending Colon	153.6
Malignant Neoplasm Of Splenic Flexure	153.7
Malignant Neoplasm Of Other Specified Sites Of Large Intestine	153.8
Malignant Neoplasm Of Rectosigmoid Junction	154.0
Malignant Neoplasm Of Rectum	154.1
Malignant Neo Anus	154.3
Malignant Neoplasm Of Anal Canal	154.2
Mal Neo Rectum/Anus Other	154.8
Malignant Neoplasm Of Liver, Not Specified As Primary Or Secondary	155.2
Mal Neo Liver, Primary	155.0
Mal Neo Intrahepat Ducts	155.1
Malignant Neoplasm Of Biliary Tract, Part Unspecified	156.9
Malignant Neoplasm Of Gallbladder	156.0
Mal Neo Extrahepat Ducts	156.1
Malignant Neoplasm Of Ampulla Of Vater	156.2
Other Icd9 Malignant Neoplasm Of Gallbladder And Extrahepat Bile Ducts	156.8
Malignant Neoplasm Of Pancreas, Part Unspecified	157.9
Malignant Neoplasm Of Head Of Pancreas	157.0
Malignant Neoplasm Of Body Of Pancreas	157.1
Malignant Neoplasm Of Tail Of Pancreas	157.2
Malignant Neoplasm Of Pancreatic Duct	157.3
Mal Neo Islet Langerhans	157.4
Malignant Neoplasm Of Other Specified Sites Of Pancreas	157.8
Mal Neo Retroperitoneum	158.0
Malignant Neoplasm Of Peritoneum, Unspecified	158.9

Cancer Descriptions	ICD-9 codes
Mal Neo Peritoneum Other	158.8
Malignant Neoplasm Of Spleen, Not Elsewhere Classified	159.1
Malignant Neoplasm Of Other Sites Of Digestive System And Intra-Abdominal Organs	159.8
Malignant Neoplasm Of Ill-Defined Sites Within The Respiratory System	165.9
Malignant Neoplasm Of Upper Respiratory Tract, Part Unspecified	165.0
Malignant Neoplasm Of Accessory Sinus, Unspecified	160.9
Mal Neo Nasal Cavities	160.0
Malig Neo Middle Ear	160.1
Malignant Neoplasm Of Maxillary Sinus	160.2
Malignant Neoplasm Of Ethmoidal Sinus	160.3
Malignant Neoplasm Of Frontal Sinus	160.4
Malignant Neoplasm Of Sphenoidal Sinus	160.5
Malignant Neoplasm Of Other Accessory Sinuses	160.8
Malignant Neoplasm Of Larynx, Unspecified	161.9
Malignant Neoplasm Of Glottis	161.0
Malignant Neoplasm Of Supraglottis	161.1
Malignant Neoplasm Of Subglottis	161.2
Mal Neo Cartilage Larynx	161.3
Malignant Neo Larynx Other	161.8
Malignant Neoplasm Of Bronchus And Lung, Unspecified	162.9
Malignant Neo Trachea	162.0
Malig Neo Main Bronchus	162.2
Mal Neo Upper Lobe Lung	162.3
Mal Neo Middle Lobe Lung	162.4
Mal Neo Lower Lobe Lung	162.5
Malignant Neoplasm Of Other Parts Of Bronchus Or Lung	162.8
Malignant Neoplasm Of Pleura, Unspecified	163.9
Malignant Neoplasm Of Parietal Pleura	163.0
Malignant Neoplasm Of Visceral Pleura	163.1
Malignant Neoplasm Of Other Specified Sites Of Pleura	163.8
Malignant Neoplasm Of Mediastinum, Part Unspecified	164.9
Malignant Neoplasm Of Thymus	164.0
Malignant Neopl Heart	164.1
Malignant Neoplasm Of Anterior Mediastinum	164.2
Malignant Neoplasm Of Posterior Mediastinum	164.3
Malignant Neoplasm Of Other Parts Of Mediastinum	164.8
Other Icd9 Malignant Neoplasm Of Respiratory System And Intrathoracic Organs	165.8
Malignant Neoplasm Of Bone And Articular Cartilage, Site Unspecified	170.9
Malignant Neoplasm Of Bones Of Skull And Face, Except Mandible	170.0
Malignant Neoplasm Of Mandible	170.1
Malignant Neoplasm Of Vertebral Column, Excluding Sacrum And Coccyx	170.2
Mal Neo Ribs/Stern/Clav	170.3
Malignant Neoplasm Of Scapula And Long Bones Of Upper Limb	170.4
Malignant Neoplasm Of Short Bones Of Upper Limb	170.5
Mal Neo Pelvic Girdle	170.6
Malignant Neoplasm Of Long Bones Of Lower Limb	170.7
Malignant Neoplasm Of Short Bones Of Lower Limb	170.8
Malignant Neoplasm Of Connective And Other Soft Tissue, Site Unspecified	171.9
Malignant Neoplasm Of Connective And Other Soft Tissue Of Head, Face, And Neck	171.0
Malignant Neoplasm Of Connective And Soft Tissue Upper Limb, Including Shoulder	171.2
Malignant Neoplasm Of Connective And Soft Tissue Of Lower Limb, Including Hip	171.3
Malignant Neoplasm Of Connective And Other Soft Tissue Of Trunk, Unspecified	171.7
Malignant Neoplasm Of Connective And Other Soft Tissue Of Thorax	171.4
Malignant Neoplasm Of Connective And Other Soft Tissue Of Abdomen	171.5
Malignant Neoplasm Of Connective And Other Soft Tissue Of Pelvis	171.6
Malignant Neoplasm Of Other Specified Sites Of Connective And Other Soft Tissue	171.8

Cancer Descriptions	ICD-9 codes
Unspecified Malignant Neoplasm Of Skin, Site Unspecified	173.90
Unspecified Malignant Neoplasm Of Skin Of Lip	173.00
Unspecified Malignant Neoplasm Of Eyelid, Including Canthus	173.10
Unspecified Malignant Neoplasm Of Skin Of Ear And External Auditory Canal	173.20
Unspecified Malignant Neoplasm Of Skin Of Other And Unspecified Parts Of Face	173.30
Unspecified Malignant Neoplasm Of Scalp And Skin Of Neck	173.40
Unspecified Malignant Neoplasm Of Skin Of Trunk, Except Scrotum	173.50
Unspecified Malignant Neoplasm Of Skin Of Upper Limb, Including Shoulder	173.60
Unspecified Malignant Neoplasm Of Skin Of Lower Limb, Including Hip	173.70
Unspecified Malignant Neoplasm Of Other Specified Sites Of Skin	173.80
Malignant Neoplasm Of Breast (Female), Unspecified	174.9
Malignant Neoplasm Of Nipple And Areola Of Female Breast	174.0
Malignant Neoplasm Of Central Portion Of Female Breast	174.1
Malignant Neoplasm Of Upper-Inner Quadrant Of Female Breast	174.2
Malignant Neoplasm Of Lower-Inner Quadrant Of Female Breast	174.3
Malignant Neoplasm Of Upper-Outer Quadrant Of Female Breast	174.4
Malignant Neoplasm Of Lower-Outer Quadrant Of Female Breast	174.5
Malignant Neoplasm Of Axillary Tail Of Female Breast	174.6
Malignant Neoplasm Of Other Specified Sites Of Female Breast	174.8
Malignant Neoplasm Of Other And Unspecified Sites Of Male Breast	175.9
Malignant Neoplasm Of Nipple And Areola Of Male Breast	175.0
Malignant Neoplasm Of Female Genital Organ, Site Unspecified	184.9
Malignant Neopl Placenta	181.
Malig Neopl Uterus	179.
Malignant Neoplasm Of Cervix Uteri, Unspecified	180.9
Malig Neo Endocervix	180.0
Malignant Neoplasm Of Exocervix	180.1
Malignant Neoplasm Of Other Specified Sites Of Cervix	180.8
Malignant Neoplasm Of Other Specified Sites Of Body Of Uterus	182.8
Malignant Neoplasm Of Corpus Uteri, Except Isthmus	182.0
Malignant Neoplasm Of Isthmus	182.1
Malignant Neoplasm Of Uterine Adnexa, Unspecified	183.9
Malignant Neoplasm Of Ovary	183.0
Malignant Neoplasm Of Fallopian Tube	183.2
Malignant Neoplasm Of Broad Ligament Of Uterus	183.3
Malignant Neoplasm Of Parametrium	183.4
Malignant Neoplasm Of Round Ligament Of Uterus	183.5
Malignant Neoplasm Of Other Specified Sites Of Uterine Adnexa	183.8
Malign Neopl Vagina	184.0
Malignant Neoplasm Of Vulva, Unspecified	184.4
Mal Neo Labia Majora	184.1
Malignant Neoplasm Of Labia Minora	184.2
Malignant Neoplasm Of Clitoris	184.3
Malignant Neoplasm Of Other Specified Sites Of Female Genital Organs	184.8
Malignant Neoplasm Of Male Genital Organ, Site Unspecified	187.9
Malign Neopl Prostate	185.
Malignant Neoplasm Of Other And Unspecified Testis	186.9
Mal Neo Undescend Testis	186.0
Malignant Neoplasm Of Penis, Part Unspecified	187.4
Malignant Neoplasm Of Prepuce	187.1
Malignant Neoplasm Of Glans Penis	187.2
Malignant Neoplasm Of Body Of Penis	187.3
Malignant Neoplasm Of Epididymis	187.5
Malignant Neoplasm Of Spermatic Cord	187.6
Malignant Neoplasm Of Scrotum	187.7
Malignant Neoplasm Of Other Specified Sites Of Male Genital Organs	187.8
Malignant Neoplasm Of Urinary Organ, Site Unspecified	189.9
Malignant Neoplasm Of Bladder, Part Unspecified	188.9

Cancer Descriptions	ICD-9 codes
Malignant Neoplasm Of Trigone Of Urinary Bladder	188.0
Malignant Neoplasm Of Dome Of Urinary Bladder	188.1
Malignant Neoplasm Of Lateral Wall Of Urinary Bladder	188.2
Malignant Neoplasm Of Anterior Wall Of Urinary Bladder	188.3
Malignant Neoplasm Of Posterior Wall Of Urinary Bladder	188.4
Malignant Neoplasm Of Bladder Neck	188.5
Malignant Neoplasm Of Ureteric Orifice	188.6
Malignant Neoplasm Of Urachus	188.7
Malignant Neoplasm Of Other Specified Sites Of Bladder	188.8
Malignant Neoplasm Of Kidney, Except Pelvis	189.0
Malig Neo Renal Pelvis	189.1
Malignant Neoplasm Of Ureter	189.2
Malignant Neoplasm Of Urethra	189.3
Malignant Neoplasm Of Paraurethral Glands	189.4
Malignant Neoplasm Of Other Specified Sites Of Urinary Organs	189.8
Malignant Neoplasm Of Eye, Part Unspecified	190.9
Malignant Neoplasm Of Eyeball, Except Conjunctiva, Cornea, Retina, And Choroid	190.0
Malign Neopl Orbit	190.1
Malignant Neoplasm Of Lacrimal Gland	190.2
Malignant Neoplasm Of Conjunctiva	190.3
Malignant Neoplasm Of Cornea	190.4
Malignant Neoplasm Of Retina	190.5
Malignant Neoplasm Of Choroid	190.6
Mal Neo Lacrimal Duct	190.7
Malign Neopl Eye Other	190.8
Malignant Neoplasm Of Nervous System, Part Unspecified	192.9
Malignant Neoplasm Of Brain, Unspecified	191.9
Malignant Neoplasm Of Cerebrum, Except Lobes And Ventricles	191.0
Malignant Neoplasm Of Frontal Lobe	191.1
Mal Neo Temporal Lobe	191.2
Malignant Neoplasm Of Parietal Lobe	191.3
Malignant Neoplasm Of Occipital Lobe	191.4
Malignant Neoplasm Of Ventricles	191.5
Mal Neo Cerebellum	191.6
Mal Neo Brain Stem	191.7
Malig Neo Brain Other	191.8
Mal Neo Cranial Nerves	192.0
Mal Neo Cerebral Mening	192.1
Malignant Neoplasm Of Spinal Cord	192.2
Mal Neo Spinal Meninges	192.3
Malignant Neoplasm Of Other Specified Sites Of Nervous System	192.8
Malignant Neoplasm Of Endocrine Gland, Site Unspecified	194.9
Malign Neopl Thyroid	193.
Malign Neopl Adrenal	194.0
Malignant Neoplasm Of Pituitary Gland And Craniopharyngeal Duct	194.3
Malignant Neoplasm Of Pineal Gland	194.4
Malignant Neoplasm Of Carotid Body	194.5
Malignant Neoplasm Of Aortic Body And Other Paraganglia	194.6
Malignant Neoplasm Of Other Endocrine Glands And Related Structures	194.8
Mal Neo Head/Face/Neck	195.0
Malign Neopl Thorax	195.1
Malignant Neoplasm Of Abdomen	195.2
Malign Neopl Pelvis	195.3
Malign Neopl Arm	195.4
Malign Neopl Leg	195.5
Malignant Neoplasm Of Other Specified Sites	195.8
Secondary And Unspecified Malignant Neoplasm Of Lymph Nodes, Site Unspecified	196.9
Mal Neo Lymph-Head/Neck	196.0

Cancer Descriptions	ICD-9 codes
Mal Neo Lymph-Intrathor	196.1
Mal Neo Lymph Intra-Abd	196.2
Mal Neo Lymph-Axilla/Arm	196.3
Secondary Malignant Neoplasm Of Lymph Nodes Of Inguinal Region And Lower Limb	196.5
Mal Neo Lymph-Intrapelv	196.6
Mal Neo Lymph Node-Mult	196.8
Secondary Malignant Neoplasm Of Lung	197.0
Secondary Malignant Neoplasm Of Mediastinum	197.1
Secondary Malignant Neoplasm Of Pleura	197.2
Secondary Malignant Neoplasm Of Other Respiratory Organs	197.3
Secondary Malignant Neoplasm Of Small Intestine Including Duodenum	197.4
Secondary Malignant Neoplasm Of Large Intestine And Rectum	197.5
Secondary Malignant Neoplasm Of Retroperitoneum And Peritoneum	197.6
Malignant Neoplasm Of Liver, Specified As Secondary	197.7
Secondary Malignant Neoplasm Of Other Digestive Organs And Spleen	197.8
Secondary Malignant Neoplasm Of Kidney	198.0
Sec Malig Neo Urin Other	198.1
Secondary Malig Neo Skin	198.2
Secondary Malignant Neoplasm Of Brain And Spinal Cord	198.3
Sec Malig Neo Nerve Other	198.4
Secondary Malignant Neoplasm Of Bone And Bone Marrow	198.5
Secondary Malignant Neoplasm Of Adrenal Gland	198.7
Secondary Malignant Neoplasm Of Breast	198.81
Secondary Malignant Neoplasm Of Genital Organs	198.82
Secondary Malignant Neoplasm Of Ovary	198.6
Secondary Malignant Neoplasm Of Other Specified Sites	198.89
Burkitt's Tumor Or Lymphoma, Unspecified Site, Extranodal And Solid Organ Sites	200.20
Burkitt's Tumor Or Lymphoma Involving Lymph Nodes Of Head, Face, And Neck	200.21
Burkitt's Tumor Or Lymphoma Involving Intrathoracic Lymph Nodes	200.22
Burkitt's Tumor Or Lymphoma Involving Intra-Abdominal Lymph Nodes	200.23
Burkitt's Tumor Or Lymphoma Involving Lymph Nodes Of Axilla And Upper Limb	200.24
Burkitt's Tumor Or Lymphoma, Inguinal Region/Lower Limb Nodes	200.25
Burkitt's Tumor Or Lymphoma Involving Intrapelvic Lymph Nodes	200.26
Burkitt's Tumor Or Lymphoma Involving Spleen	200.27
Burkitt's Tumor Or Lymphoma Involving Lymph Nodes Of Multiple Sites	200.28
Other Icd9 Malignant Neoplasms, Lymphoid/Histiocytic, Extranodal/Solid Organs	202.90
Malignant Mast Cell Tumors, Unspecified Site, Extranodal And Solid Organ Sites	202.60
Malignant Mast Cell Tumors Involving Lymph Nodes Of Head, Face, And Neck	202.61
Malignant Mast Cell Tumors Involving Intrathoracic Lymph Nodes	202.62
Malignant Mast Cell Tumors Involving Intra-Abdominal Lymph Nodes	202.63
Malignant Mast Cell Tumors Involving Lymph Nodes Of Axilla And Upper Limb	202.64
Malignant Mast Cell Tumors Inguinal Region/Lower Limb Nodes	202.65
Malignant Mast Cell Tumors Involving Intrapelvic Lymph Nodes	202.66
Malignant Mast Cell Tumors Involving Spleen	202.67
Malignant Mast Cell Tumors Involving Lymph Nodes Of Multiple Sites	202.68
Other Icd9 Malignant Neoplasm, Lymphoid/Histiocytic Tissue Head/Face/Neck Nodes	202.91
Other Icd9 Malignant Neoplasm, Lymphoid/Histiocytic Tissue Intrathoracic Nodes	202.92
Other Icd9 Malignant Neoplasm, Lymphoid/Histiocytic Tissue Intra-Abdominal Nodes	202.93
Other Icd9 Malignant Neoplasm, Lymphoid/Histiocytic Tissue Axilla/Upper Limb	202.94
Other Icd9 Malignant Neoplasm Lymphoid/Histiocytic Inguinal Region/Lower Limb	202.95
Other Icd9 Malignant Neoplasm Of Lymphoid/Histiocytic Tissue Intrapelvic Nodes	202.96
Other Icd9 Malignant Neoplasms Of Lymphoid And Histiocytic Tissue Spleen	202.97
Other Icd9 Malignant Neoplasms Of Lymphoid And Histiocytic Tissue Multiple Sites	202.98
Other Immunoproliferative Neoplasms Without Mention Of Remission	203.80
Benign Neoplasm Of Unspecified Site	229.9

Cancer Descriptions	ICD-9 codes
Benign Neoplasm Of Lymph Nodes	229.0
Benign Neoplasm Of Other Specified Sites	229.8
Benign Neoplasm Of Pharynx, Unspecified	210.9
Benign Neoplasm Lip	210.0
Benign Neoplasm Tongue	210.1
Ben Neo Major Salivary	210.2
Benign Neoplasm Of Floor Of Mouth	210.3
Benign Neoplasm Of Other And Unspecified Parts Of Mouth	210.4
Benign Neoplasm Of Tonsil	210.5
Benign Neoplasm Of Other Parts Of Oropharynx	210.6
Benign Neo Nasopharynx	210.7
Benign Neo Hypopharynx	210.8
Benign Neoplasm Of Other And Unspecified Site In The Digestive System	211.9
Benign Neo Esophagus	211.0
Benign Neoplasm Stomach	211.1
Benign Neoplasm Of Duodenum, Jejunum, And Ileum	211.2
Benign Neoplasm Lg Bowel	211.3
Benign Neoplasm Of Rectum And Anal Canal	211.4
Benign Neoplasm Of Liver And Biliary Passages	211.5
Benign Neoplasm Of Pancreas, Except Islets Of Langerhans	211.6
Ben Neo Islets Langerhan	211.7
Benign Neoplasm Of Retroperitoneum And Peritoneum	211.8
Benign Neoplasm Of Respiratory And Intrathoracic Organs, Site Unspecified	212.9
Benign Neoplasm Of Nasal Cavities, Middle Ear, And Accessory Sinuses	212.0
Benign Neo Larynx	212.1
Benign Neoplasm Of Trachea	212.2
Benign Neoplasm Of Bronchus And Lung	212.3
Benign Neoplasm Pleura	212.4
Benign Neo Mediastinum	212.5
Benign Neoplasm Of Thymus	212.6
Benign Neoplasm Of Heart	212.7
Benign Neoplasm Of Other Specified Sites Of Respiratory And Intrathoracic Organs	212.8
Benign Neoplasm Of Bone And Articular Cartilage, Site Unspecified	213.9
Benign Neoplasm Of Bones Of Skull And Face	213.0
Ben Neo Lower Jaw Bone	213.1
Benign Neoplasm Of Vertebral Column, Excluding Sacrum And Coccyx	213.2
Ben Neo Ribs/Stern/Clav	213.3
Benign Neoplasm Of Scapula And Long Bones Of Upper Limb	213.4
Benign Neoplasm Of Short Bones Of Upper Limb	213.5
Benign Neo Pelvic Girdle	213.6
Ben Neo Long Bones Leg	213.7
Ben Neo Bones Ankle/Foot	213.8
Other Benign Neoplasm Of Connective And Other Soft Tissue, Site Unspecified	215.9
Benign Neoplasm Of Connective And Other Soft Tissue, Head, Face And Neck	215.0
Benign Neoplasm Of Connective/Other Soft Tissue, Upper Limb, Including Shoulder	215.2
Benign Neoplasm Of Connective/Other Soft Tissue, Lower Limb, Including Hip	215.3
Other Benign Neoplasm Of Connective And Other Soft Tissue Of Thorax	215.4
Other Benign Neoplasm Of Connective And Other Soft Tissue Of Abdomen	215.5
Other Benign Neoplasm Of Connective And Other Soft Tissue Of Pelvis	215.6
Other Benign Neoplasm Of Connective And Other Soft Tissue Of Trunk, Unspecified	215.7
Other Icd9 Benign Neoplasm Of Connective And Other Soft Tissue	215.8
Benign Neoplasm Of Skin, Site Unspecified	216.9
Benign Neoplasm Of Skin Of Other And Unspecified Parts Of Face	216.3
Benign Neoplasm Of Skin Of Lip	216.0
Benign Neo Skin Eyelid	216.1
Benign Neoplasm Of Ear And External Auditory Canal	216.2
Benign Neoplasm Of Scalp And Skin Of Neck	216.4
Benign Neoplasm Of Skin Of Trunk, Except Scrotum	216.5

Cancer Descriptions	ICD-9 codes
Benign Neoplasm Of Skin Of Upper Limb, Including Shoulder	216.6
Benign Neoplasm Of Skin Of Lower Limb, Including Hip	216.7
Benign Neoplasm Skin Other	216.8
Benign Neoplasm Breast	217.
Leiomyoma Of Uterus, (Fibroid Tumor)	218.9
Benign Neoplasm Of Uterus, Part Unspecified	219.9
Benign Neoplasm Of Cervix Uteri	219.0
Benign Neo Corpus Uteri	219.1
Benign Neoplasm Of Other Specified Parts Of Uterus	219.8
Benign Neoplasm Of Female Genital Organ, Site Unspecified	221.9
Benign Neoplasm Ovary	220.
Ben Neo Fallopian Tube	221.0
Benign Neoplasm Vagina	221.1
Benign Neoplasm Vulva	221.2
Ben Neo Fem Genital Other	221.8
Benign Neoplasm Of Male Genital Organ, Site Unspecified	222.9
Benign Neoplasm Of Testis	222.0
Benign Neoplasm Penis	222.1
Benign Neoplasm Of Prostate	222.2
Benign Neoplasm Of Epididymis	222.3
Benign Neoplasm Of Scrotum	222.4
Benign Neoplasm Of Other Specified Sites Of Male Genital Organs	222.8
Benign Neoplasm Of Urinary Organ, Site Unspecified	223.9
Benign Neoplasm Of Kidney, Except Pelvis	223.0
Benign Neoplasm Of Renal Pelvis	223.1
Benign Neoplasm Of Ureter	223.2
Benign Neoplasm Of Bladder	223.3
Benign Neoplasm Of Urethra	223.81
Benign Neoplasm Of Other Specified Sites Of Urinary Organs	223.89
Benign Neoplasm Of Eye, Part Unspecified	224.9
Benign Neoplasm Of Eyeball, Except Conjunctiva, Cornea, Retina, And Choroid	224.0
Benign Neoplasm Of Orbit	224.1
Benign Neoplasm Of Lacrimal Gland	224.2
Benign Neoplasm Of Conjunctiva	224.3
Benign Neoplasm Of Cornea	224.4
Benign Neoplasm Of Retina	224.5
Benign Neoplasm Of Choroid	224.6
Ben Neo Lacrimal Duct	224.7
Benign Neoplasm Of Other Specified Parts Of Eye	224.8
Benign Neoplasm Of Nervous System, Part Unspecified	225.9
Benign Neoplasm Brain	225.0
Benign Neoplasm Of Cranial Nerves	225.1
Ben Neo Cerebr Meninges	225.2
Benign Neoplasm Of Spinal Cord	225.3
Ben Neo Spinal Meninges	225.4
Benign Neoplasm Of Other Specified Sites Of Nervous System	225.8
Benign Neoplasm Thyroid	226.
Benign Neoplasm Of Endocrine Gland, Site Unspecified	227.9
Benign Neoplasm Of Adrenal Gland	227.0
Benign Neoplasm Of Parathyroid Gland	227.1
Benign Neoplasm Of Pituitary Gland And Craniopharyngeal Duct (Pouch)	227.3
Benign Neoplasm Of Pineal Gland	227.4
Benign Neoplasm Of Carotid Body	227.5
Ben Neo Paraganglia Other	227.6
Benign Neoplasm Of Other Endocrine Glands And Related Structures	227.8
Carcinoma In Situ, Site Unspecified	234.9
Carcinoma In Situ Of Eye	234.0
Carcinoma In Situ Of Other Specified Sites	234.8

Cancer Descriptions	ICD-9 codes
Carcinoma In Situ Of Other And Unspecified Digestive Organs	230.9
Ca In Situ Oral Cav/Phar	230.0
Carcinoma In Situ Of Esophagus	230.1
Carcinoma In Situ Of Stomach	230.2
Carcinoma In Situ Of Rectum	230.4
Carcinoma In Situ Of Anal Canal	230.5
Carcinoma In Situ Of Anus, Unspecified	230.6
Carcinoma In Situ Of Other And Unspecified Parts Of Intestine	230.7
Carcinoma In Situ Of Colon	230.3
Carcinoma In Situ Of Liver And Biliary System	230.8
Carcinoma In Situ Of Respiratory System, Part Unspecified	231.9
Carcinoma In Situ Of Larynx	231.0
Carcinoma In Situ Of Trachea	231.1
Carcinoma In Situ Of Bronchus And Lung	231.2
Ca In Situ Resp Sys Other	231.8
Carcinoma In Situ Of Skin, Site Unspecified	232.9
Carcinoma In Situ Of Skin Of Other And Unspecified Parts Of Face	232.3
Carcinoma In Situ Of Skin Of Lip	232.0
Carcinoma In Situ Of Eyelid, Including Canthus	232.1
Carcinoma In Situ Of Skin Of Ear And External Auditory Canal	232.2
Carcinoma In Situ Of Scalp And Skin Of Neck	232.4
Carcinoma In Situ Of Skin Of Trunk, Except Scrotum	232.5
Carcinoma In Situ Of Skin Of Upper Limb, Including Shoulder	232.6
Carcinoma In Situ Of Skin Of Lower Limb, Including Hip	232.7
Carcinoma In Situ Of Other Specified Sites Of Skin	232.8
Carcinoma In Situ Of Other And Unspecified Urinary Organs	233.9
Carcinoma In Situ Of Breast	233.0
Carcinoma In Situ Of Cervix Uteri	233.1
Carcinoma In Situ Of Other And Unspecified Parts Of Uterus	233.2
Carcinoma In Situ Of Prostate	233.4
Carcinoma In Situ Of Penis	233.5
Carcinoma In Situ Of Other And Unspecified Male Genital Organs	233.6
Carcinoma In Situ Of Bladder	233.7
Neoplasm Of Uncertain Behavior, Site Unspecified	238.9
Unc Behav Neo Salivary	235.0
Unc Behav Neo Oral/Phar	235.1
Unc Behav Neo Intestine	235.2
Neoplasm Of Uncertain Behavior Of Liver And Biliary Passages	235.3
Neoplasm Of Uncertain Behavior Of Retroperitoneum And Peritoneum	235.4
Unc Behav Neo Gi Other	235.5
Unc Behav Neo Larynx	235.6
Unc Behav Neo Lung	235.7
Unc Behav Neo Pleura	235.8
Neoplasm Of Uncertain Behavior Of Other And Unspecified Respiratory Organs	235.9
Neoplasm Of Uncertain Behavior Of Testis	236.4
Neoplasm Of Uncertain Behavior Of Prostate	236.5
Neoplasm Of Uncertain Behavior Of Other And Unspecified Male Genital Organs	236.6
Neoplasm Of Uncertain Behavior Of Uterus	236.0
Neoplasm Of Uncertain Behavior Of Placenta	236.1
Neoplasm Of Uncertain Behavior Of Ovary	236.2
Neoplasm Of Uncertain Behavior Of Other And Unspecified Female Genital Organs	236.3
Neoplasm Of Uncertain Behavior Of Urinary Organ, Unspecified	236.90
Neoplasm Of Uncertain Behavior Of Bladder	236.7
Neoplasm Of Uncertain Behavior Of Kidney And Ureter	236.91
Neoplasm Of Uncertain Behavior Of Other Urinary Organs	236.99
Unc Behav Neo Pituitary	237.0
Neoplasm Of Uncertain Behavior Of Pineal Gland	237.1
Neoplasm Of Uncertain Behavior Of Adrenal Gland	237.2

Cancer Descriptions	ICD-9 codes
Unc Behav Neo Paragang	237.3
Neoplasm Of Uncertain Behavior Of Other And Unspecified Endocrine Glands	237.4
Neoplasm Of Uncertain Behavior Of Brain And Spinal Cord	237.5
Unc Behav Neo Meninges	237.6
Neoplasm Of Uncertain Behavior Of Other And Unspecified Parts Of Nervous System	237.9
Neoplasm Of Uncertain Behavior Of Bone And Articular Cartilage	238.0
Neoplasm Of Uncertain Behavior Of Connective And Other Soft Tissue	238.1
Neoplasm Of Uncertain Behavior Of Skin	238.2
Neoplasm Of Uncertain Behavior Of Breast	238.3
Neoplasm Of Uncertain Behavior Of Histiocytic And Mast Cells	238.5
Neoplasm Of Uncertain Behavior Of Plasma Cells	238.6
Neoplasm Of Uncertain Behavior Of Other Specified Sites	238.8
Neoplasm Of Unspecified Nature, Site Unspecified	239.9
Neoplasm Of Unspecified Nature Of Digestive System	239.0
Neoplasm Of Unspecified Nature Of Respiratory System	239.1
Bone/Skin Neoplasm	239.2
Neoplasm Of Unspecified Nature Of Breast	239.3
Neoplasm Of Unspecified Nature Of Bladder	239.4
Neoplasm Of Unspecified Nature Of Other Genitourinary Organs	239.5
Neoplasm Of Unspecified Nature Of Brain	239.6
Neoplasm Of Unspecified Nature Of Endocrine Glands/Other Parts Of Nervous System	239.7
Glaucoma Associated With Tumors Or Cysts	365.64
Opt Chiasm W Pituit Dis	377.51
Opt Chiasm Dis/Neopl Other	377.52
Disorders Of Other Visual Pathways Associated With Neoplasms	377.61
Vis Cortex Dis W Neoplasm	377.71
Malignant Neoplasm Of Parathyroid Gland	194.1
Other Immunoproliferative Neoplasms In Remission	203.81
Giant Cell Tumor Tendon	727.02
Osteitis Deformans Without Mention Of Bone Tumor	731.0
Tumors Of Body Of Uterus, Unspecified As To Episode Of Care In Pregnancy	654.10
Tumors Of Body Of Uterus, With Delivery	654.11
Tumors Of Body Of Uterus, Delivered, With Mention Of Postpartum Complication	654.12
Tumors Of Body Of Uterus, Antepartum Condition Or Complication	654.13
Tumors Of Body Of Uterus, Postpartum Condition Or Complication	654.14
Unspecified Personal History Of Malignant Neoplasm	V10.90
Personal History Of Malignant Neoplasm In Gastrointestinal Tract	V10.00
Personal History Of Malignant Neoplasm Of Oral Cavity And Pharynx	V10.02
Personal History Of Malignant Neoplasm Of Tongue	V10.01
Personal History Of Malignant Neoplasm Of Esophagus	V10.03
Personal History Of Malignant Neoplasm Of Stomach	V10.04
Personal History Of Malignant Neoplasm Of Large Intestine	V10.05
Personal History Of Malignant Neoplasm Of Rectum, Rectosigmoid Junction, Anus	V10.06
Personal History Of Malignant Neoplasm Of Liver	V10.07
Personal History Of Malignant Neoplasm Of Other Sites In Gastrointestinal Tract	V10.09
Personal History Of Malignant Neoplasm Of Unspecified Respiratory Organ	V10.20
Personal History Of Malignant Neoplasm Of Bronchus And Lung	V10.11
Personal History Of Malignant Neoplasm Of Trachea	V10.12
Personal History Of Malignant Neoplasm Of Larynx	V10.21
Personal History Of Malignant Neoplasm Of Nasal Cavities, Middle Ear, Sinuses	V10.22
Personal History Of Malignant Neoplasm Of Other Respiratory/Intrathoracic Organs	V10.29
Personal History Of Malignant Neoplasm Of Breast	V10.3
Personal History Of Malignant Neoplasm Of Unspecified Female Genital Organ	V10.40
Personal History Of Malignant Neoplasm Of Cervix Uteri	V10.41
Personal History Of Malignant Neoplasm Of Other Parts Of Uterus	V10.42
Personal History Of Malignant Neoplasm Of Ovary	V10.43

Cancer Descriptions	ICD-9 codes
Personal History Of Malignant Neoplasm Of Other Female Genital Organs	V10.44
Personal History Of Malignant Neoplasm Of Unspecified Male Genital Organ	V10.45
Personal History Of Malignant Neoplasm Of Prostate	V10.46
Personal History Of Malignant Neoplasm Of Testis	V10.47
Personal History Of Malignant Neoplasm Of Other Male Genital Organs	V10.49
Personal History Of Malignant Neoplasm Of Unspecified Urinary Organ	V10.50
Personal History Of Malignant Neoplasm Of Bladder	V10.51
Personal History Of Malignant Neoplasm Of Kidney	V10.52
Personal History Of Other Lymphatic And Hematopoietic Neoplasms	V10.79
Personal History Of Malignant Neoplasm Of Bone	V10.81
Personal History Of Other Malignant Neoplasm Of Skin	V10.83
Personal History Of Malignant Neoplasm Of Eye	V10.84
Personal History Of Malignant Neoplasm Of Brain	V10.85
Personal History Of Malignant Neoplasm Of Other Parts Of Nervous System	V10.86
Personal History Of Malignant Neoplasm Of Thyroid	V10.87
Personal History Of Malignant Neoplasm, Other Endocrine Glands/Related Structure	V10.88
Personal History Of Malignant Neoplasm Of Other Sites	V10.89
Family History Of Unspecified Malignant Neoplasm	V16.9
Family History Of Malignant Neoplasm Of Gastrointestinal Tract	V16.0
Family History Of Malignant Neoplasm Of Trachea, Bronchus, And Lung	V16.1
Family History Of Malignant Neoplasm Of Other Respiratory/Intrathoracic Organs	V16.2
Family History Of Malignant Neoplasm Of Breast	V16.3
Family History Of Malignant Neoplasm Of Genital Organs	V16.40
Family History Of Other Lymphatic And Hematopoietic Neoplasms	V16.7
Family History Of Other Specified Malignant Neoplasm	V16.8
Observation For Suspected Malignant Neoplasm	V71.1
Screening For Unspecified Malignant Neoplasms	V76.9
Special Screening For Malignant Neoplasms Of The Respiratory Organs	V76.0
Screening For Malignant Neoplasms Of The Breast	V76.10
Screening For Malignant Neoplasms Of The Cervix	V76.2
Screening For Malignant Neoplasms Of The Bladder	V76.3
Screening For Malignant Neoplasms Of The Rectum	V76.41
Screening For Malignant Neoplasms Of The Oral Cavity	V76.42
Screening For Malignant Neoplasms Of The Skin	V76.43
Screening For Malignant Neoplasms Of Other Sites	V76.49
Injection Or Infusion Of Cancer Chemotherapeutic Substance	99.25
Hyperthermia Ca Therapy	99.85
Personal History Of Benign Neoplasm Brain	V12.41
Family History Of Ovarian Malignancy	V16.41
Family History Of Malignant Neoplasm Of Prostate	V16.42
Family History Of Other Icd9 Genital Malignancy	V16.49
Family History Of Malignancy Of Testis	V16.43
Screening For Malignant Neoplasms Of The Breast In High-Risk Patients	V76.11
Screening For Malignant Neoplasms Of The Breast In Other-Risk Patients	V76.12
Screening For Other Icd9 Malignant Neoplasms Of The Breast	V76.19
Personal History Of Malignant Neoplasm Of Epididymis	V10.48
Family History Of Malignant Neoplasm Of Kidney	V16.51
Screening For Malignant Neoplasms Of The Prostate	V76.44
Screening For Malignant Neoplasms Of The Testis	V76.45
Screening For Malignant Neoplasm Of Ovary	V76.46
Screening For Malignant Neoplasm Of Vagina	V76.47
Screening For Malignant Neoplasm Of Intestine	V76.50
Screening For Malignant Neoplasm Of Colon	V76.51
Screening For Malignant Neoplasm Of Small Intestine	V76.52
Screening For Malignant Neoplasm Of Nervous System	V76.81
Screening For Malignant Neoplasm, Not Elsewhere Classified	V76.89
Anemia In Neoplastic Disease	285.22

Cancer Descriptions	ICD-9 codes
Personal History Of Malignant Neoplasm Of Other Urinary Organs	V10.59
Aftercare Following Surgery For Neoplasm	V58.42
Genetic Susceptibility To Malignant Neoplasm Of Breast	V84.01
Genetic Susceptibility To Malignant Neoplasm Of Ovary	V84.02
Genetic Susceptibility To Malignant Neoplasm Of Prostate	V84.03
Genetic Susceptibility To Malignant Neoplasm Of Endometrium	V84.04
Genetic Susceptibility To Other Malignant Neoplasm	V84.09
Neoplasm Related Pain (Acute) (Chronic)	338.3
Papanicolaou Smear Of Cervix With Cytologic Evidence Of Malignancy	795.06
Elevated Cancer Antigen 125 [Ca 125]	795.82
Other Abnormal Tumor Markers	795.89
Carcinoma In Situ, Unspecified Female Genital Organ	233.30
Carcinoma In Situ,Vagina	233.31
Carcinoma In Situ,Vulva	233.32
Carcinoma In Situ, Other Female Genital Organ	233.39
Vulvar Intraepithelial Neoplasia I [Vin I]	624.01
Vulvar Intraepithelial Neoplasia Ii [Vin Ii]	624.02
Family History Of Malignant Neoplasm, Bladder	V16.52
Yaba Monkey Tumor Virus	059.22
Malignant Neoplasm Associated With Transplanted Organ	199.2
Other Immunoproliferative Neoplasms In Relapse	203.82
Malignant Carcinoid Tumor Of The Small Intestine, Unspecified Portion	209.00
Malignant Carcinoid Tumor Of The Duodenum	209.01
Malignant Carcinoid Tumor Of The Jejunum	209.02
Malignant Carcinoid Tumor Of The Ileum	209.03
Malignant Carcinoid Tumor Of The Large Intestine, Unspecified Portion	209.10
Malignant Carcinoid Tumor Of The Appendix	209.11
Malignant Carcinoid Tumor Of The Cecum	209.12
Malignant Carcinoid Tumor Of The Ascending Colon	209.13
Malignant Carcinoid Tumor Of The Transverse Colon	209.14
Malignant Carcinoid Tumor Of The Descending Colon	209.15
Malignant Carcinoid Tumor Of The Sigmoid Colon	209.16
Malignant Carcinoid Tumor Of The Rectum	209.17
Malignant Carcinoid Tumor Of Unknown Primary Site	209.20
Malignant Carcinoid Tumor Of The Bronchus And Lung	209.21
Malignant Carcinoid Tumor Of The Thymus	209.22
Malignant Carcinoid Tumor Of The Stomach	209.23
Malignant Carcinoid Tumor Of The Kidney	209.24
Malignant Carcinoid Tumor Of The Foregut Nos	209.25
Malignant Carcinoid Tumor Of The Midgut Nos	209.26
Malignant Carcinoid Tumor Of The Hindgut Nos	209.27
Malignant Carcinoid Tumors Of Other Sites	209.29
Malignant Poorly Differentiated Neuroendocrine Carcinoma, Any Site	209.30
Benign Carcinoid Tumor Of The Small Intestine, Unspecified Portion	209.40
Benign Carcinoid Tumor Of The Duodenum	209.41
Benign Carcinoid Tumor Of The Jejunum	209.42
Benign Carcinoid Tumor Of The Ileum	209.43
Benign Carcinoid Tumor Of The Large Intestine, Unspecified Portion	209.50
Benign Carcinoid Tumor Of The Appendix	209.51
Benign Carcinoid Tumor Of The Cecum	209.52
Benign Carcinoid Tumor Of The Ascending Colon	209.53
Benign Carcinoid Tumor Of The Transverse Colon	209.54
Benign Carcinoid Tumor Of The Descending Colon	209.55
Benign Carcinoid Tumor Of The Sigmoid Colon	209.56
Benign Carcinoid Tumor Of The Rectum	209.57
Benign Carcinoid Tumor Of Unknown Primary Site	209.60
Benign Carcinoid Tumor Of The Bronchus And Lung	209.61
Benign Carcinoid Tumor Of The Thymus	209.62

Cancer Descriptions	ICD-9 codes
Benign Carcinoid Tumor Of The Stomach	209.63
Benign Carcinoid Tumor Of The Kidney	209.64
Benign Carcinoid Tumor Of The Foregut Nos	209.65
Benign Carcinoid Tumor Of The Midgut Nos	209.66
Benign Carcinoid Tumor Of The Hindgut Nos	209.67
Benign Carcinoid Tumors Of Other Sites	209.69
Papanicolaou Smear Of Vagina With Cytologic Evidence Of Malignancy	795.16
Papanicolaou Smear Of Anus With Cytologic Evidence Of Malignancy	796.76
Merkel Cell Carcinoma Of The Face	209.31
Merkel Cell Carcinoma Of The Scalp And Neck	209.32
Merkel Cell Carcinoma Of The Upper Limb	209.33
Merkel Cell Carcinoma Of The Lower Limb	209.34
Merkel Cell Carcinoma Of The Trunk	209.35
Merkel Cell Carcinoma Of Other Sites	209.36
Secondary Neuroendocrine Tumor, Unspecified Site	209.70
Secondary Neuroendocrine Tumor Of Distant Lymph Nodes	209.71
Secondary Neuroendocrine Tumor Of Liver	209.72
Secondary Neuroendocrine Tumor Of Bone	209.73
Secondary Neuroendocrine Tumor Of Peritoneum	209.74
Secondary Merkel Cell Carcinoma	209.75
Secondary Neuroendocrine Tumor Of Other Sites	209.79
Neoplasms Of Unspecified Nature, Retina And Choroid	239.81
Neoplasms Of Unspecified Nature, Other Specified Sites	239.89
Tumor Lysis Syndrome	277.88
Personal History Of Malignant Neuroendocrine Tumor	V10.91
Basal Cell Carcinoma Of Skin Of Lip	173.01
Squamous Cell Carcinoma Of Skin Of Lip	173.02
Other Specified Malignant Neoplasm Of Skin Of Lip	173.09
Basal Cell Carcinoma Of Eyelid, Including Canthus	173.11
Squamous Cell Carcinoma Of Eyelid, Including Canthus	173.12
Other Specified Malignant Neoplasm Of Eyelid, Including Canthus	173.19
Basal Cell Carcinoma Of Skin Of Ear And External Auditory Canal	173.21
Squamous Cell Carcinoma Of Skin Of Ear And External Auditory Canal	173.22
Other Specified Malignant Neoplasm Of Skin Of Ear And External Auditory Canal	173.29
Basal Cell Carcinoma Of Skin Of Other And Unspecified Parts Of Face	173.31
Squamous Cell Carcinoma Of Skin Of Other And Unspecified Parts Of Face	173.32
Other Specified Malignant Neoplasm Of Skin Of Other And Unspecified Parts Of Face	173.39
Basal Cell Carcinoma Of Scalp And Skin Of Neck	173.41
Squamous Cell Carcinoma Of Scalp And Skin Of Neck	173.42
Other Specified Malignant Neoplasm Of Scalp And Skin Of Neck	173.49
Basal Cell Carcinoma Of Skin Of Trunk, Except Scrotum	173.51
Squamous Cell Carcinoma Of Skin Of Trunk, Except Scrotum	173.52
Other Specified Malignant Neoplasm Of Skin Of Trunk, Except Scrotum	173.59
Basal Cell Carcinoma Of Skin Of Upper Limb, Including Shoulder	173.61
Squamous Cell Carcinoma Of Skin Of Upper Limb, Including Shoulder	173.62
Other Specified Malignant Neoplasm Of Skin Of Upper Limb, Including Shoulder	173.69
Basal Cell Carcinoma Of Skin Of Lower Limb, Including Hip	173.71
Squamous Cell Carcinoma Of Skin Of Lower Limb, Including Hip	173.72
Other Specified Malignant Neoplasm Of Skin Of Lower Limb, Including Hip	173.79
Basal Cell Carcinoma Of Other Specified Sites Of Skin	173.81
Squamous Cell Carcinoma Of Other Specified Sites Of Skin	173.82
Other Specified Malignant Neoplasm Of Other Specified Sites Of Skin	173.89
Basal Cell Carcinoma Of Skin, Site Unspecified	173.91
Squamous Cell Carcinoma Of Skin, Site Unspecified	173.92
Other Specified Malignant Neoplasm Of Skin, Site Unspecified	173.99
Lambertton Syndrome In Neoplastic Disease	358.31

Note 17 Include all diagnoses associated with gallbladder disease (9 terms)

Gallbladder Disease Descriptions	ICD-9 codes
Unspecified Disorder Of Gallbladder	575.9
Cholecystitis, Unspecified	575.10
Acute Cholecystitis	575.0
Obstruction Of Gallbladder	575.2
Hydrops Of Gallbladder	575.3
Perforation Of Gallbladder	575.4
Fistula Of Gallbladder	575.5
Cholesterolosis Of Gallbladder	575.6
Dis Of Gallbladder Other	575.8

Note 18 Include all diagnoses associated with pancreatic disease (7 terms)

Pancreatic Disease Descriptions	ICD-9 codes
Unspecified Disorder Of Pancreatic Internal Secretion	251.9
Other Specified Disorders Of Pancreatic Internal Secretion	251.8
Unspecified Disease Of Pancreas	577.9
Acute Pancreatitis	577.0
Chronic Pancreatitis	577.1
Cyst And Pseudocyst Of Pancreas	577.2
Other Specified Diseases Of Pancreas	577.8

Note 19 Include all diagnoses associated with heart failure (36 terms)

Heart Failure Descriptions	ICD-9 codes
Unspecified Hypertensive Heart Disease With Congestive Heart Failure	402.91
Malignant Hypertensive Heart Disease With Congestive Heart Failure	402.01
Benign Hypertensive Heart Disease With Congestive Heart Failure	402.11
Hypertensive Heart And Chronic Kidney Disease, Unspecified, Without Heart Failure And With Chronic Kidney Disease Stage I Through Stage Iv, Or Unspecified	404.90
Hypertensive Heart And Chronic Kidney Disease, Malignant, Without Heart Failure And With Chronic Kidney Disease Stage I Through Stage Iv, Or Unspecified	404.00
Hypertensive Heart And Chronic Kidney Disease, Benign, Without Heart Failure And With Chronic Kidney Disease Stage I Through Stage Iv, Or Unspecified	404.10
Hypertensive Heart And Chronic Kidney Disease, Unspecified, With Heart Failure And With Chronic Kidney Disease Stage I Through Stage Iv, Or Unspecified	404.91
Hypertensive Heart And Chronic Kidney Disease, Malignant, With Heart Failure And With Chronic Kidney Disease Stage I Through Stage Iv, Or Unspecified	404.01
Hypertensive Heart And Chronic Kidney Disease, Benign, With Heart Failure And With Chronic Kidney Disease Stage I Through Stage Iv, Or Unspecified	404.11
Hypertensive Heart And Chronic Kidney Disease, Unspecified, Without Heart Failure And With Chronic Kidney Disease Stage V Or End Stage Renal Disease	404.92
Hypertensive Heart And Chronic Kidney Disease, Malignant, Without Heart Failure And With Chronic Kidney Disease Stage V Or End Stage Renal Disease	404.02
Hypertensive Heart And Chronic Kidney Disease, Benign, Without Heart Failure And With Chronic Kidney Disease Stage V Or End Stage Renal Disease	404.12
Hypertensive Heart And Chronic Kidney Disease, Unspecified, With Heart Failure And Chronic Kidney Disease Stage V Or End Stage Renal Disease	404.93
Hypertensive Heart And Chronic Kidney Disease, Malignant, With Heart Failure And With Chronic Kidney Disease Stage V Or End Stage Renal Disease	404.03
Hypertensive Heart And Chronic Kidney Disease, Benign, With Heart Failure And Chronic Kidney Disease Stage V Or End Stage Renal Disease	404.13
Rheumatic Heart Failure	398.91
Heart Failure, Unspecified	428.9
Congestive Heart Failure	428.0
Left Heart Failure	428.1
Failure Of Sterile Precautions During Heart Catheterization	E872.6
Mechanical Failure Of Instrument Or Apparatus During Heart Catheterization	E874.5
Unspecified Hypertensive Heart Disease Without Congestive Heart Failure (2)	402.90
Malignant Hypertensive Heart Disease Without Congestive Heart Failure (2)	402.00
Benign Hypertensive Heart Disease Without Congestive Heart Failure (2)	402.10

Heart Failure Descriptions	ICD-9 codes
Systolic Heart Failure	428.20
Diastolic Heart Failure	428.30
Acute Systolic Heart Failure	428.21
Chronic Systolic Heart Failure	428.22
Combined Systolic And Diastolic Heart Failure	428.40
Acute On Chronic Systolic Heart Failure	428.23
Acute Combined Systolic And Diastolic Heart Failure	428.41
Chronic Combined Systolic And Diastolic Heart Failure	428.42
Acute On Chronic Combined Systolic And Diastolic Heart Failure	428.43
Acute Diastolic Heart Failure	428.31
Chronic Diastolic Heart Failure	428.32
Acute On Chronic Diastolic Heart Failure	428.33

Note 20 Include all diagnoses associated with alcohol abuse, liver damage, or toxic effects (14 terms)

Alcohol Abuse, Liver Damage, and Toxic Effects Descriptions	ICD-9 codes
Alcohol Abuse, Unspecified Drinking Behavior	305.00
Alcohol Abuse, Continuous Drinking Behavior	305.01
Alcohol Abuse, Episodic Drinking Behavior	305.02
Alcohol Abuse, In Remission	305.03
Alcoholic fatty liver	571.0
Acute alcoholic hepatitis	571.1
Alcohol cirrhosis liver	571.2
Alcohol liver damage	571.3
Toxic effect of ethyl alcohol	980.0
Toxic effect of methyl alcohol	980.1
Toxic effect of isopropyl alcohol	980.2
Toxic effect fusel oil	980.3
Toxic effect of other specified alcohols	980.8
Toxic effect of unspecified alcohol	980.9

Note 21 Include all diagnoses associated with HIV infection (3 terms)

HIV Infection Descriptions	ICD-9 codes
Human Immuno Virus Dis	042.
Human Immunodeficiency Virus, Type 2 (Hiv 2)	079.53
Asymp Hiv Infectn Status	V08.

Note 22 Include all diagnoses associated with rheumatoid arthritis (10 terms)

Rheumatoid Arthritis Descriptions	ICD-9 codes
Rheumatoid Arthritis	714.0
Felty's Syndrome	714.1
Syst Rheum Arthritis Other	714.2
Polyarticular Juvenile Rheumatoid Arthritis, Chronic Or Unspecified	714.30
Polyart Juv Rheum Arthr	714.31
Pauciarticular Juvenile Rheumatoid Arthritis	714.32
Monoarticular Juvenile Rheumatoid Arthritis	714.33
Chronic Postrheumatic Arthropathy	714.4
Ankylosing Spondylitis	720.0
Screening For Rheumatoid Arthritis	V82.1

Note 23 Include all diagnoses associated with sarcoidosis (2 terms)

Sarcoidosis Descriptions	ICD-9 codes
Sarcoidosis	135.
Meningitis In Sarcoidosis	321.4

Note 24 Include all diagnoses associated with systemic lupus (1 term)

Systemic Lupus Description	ICD-9 codes
Syst Lupus Erythematosus	710.0

Note 25 Include all diagnoses associated with viral hepatitis (23 terms)

Viral Hepatitis Descriptions	ICD-9 codes
Unspecified Viral Hepatitis Without Mention Of Hepatic Coma	070.9
Unspecified Viral Hepatitis With Hepatic Coma	070.6
Other Specified Viral Hepatitis With Hepatic Coma	070.49
Other Specified Viral Hepatitis Without Mention Of Hepatic Coma	070.59
Viral Hepatitis A Without Mention Of Hepatic Coma	070.1
Viral Hepatitis A With Hepatic Coma	070.0
Viral Hepatitis B Without Mention Of Hepatic Coma, Acute Or Unspecified	070.30
Viral Hepatitis B With Hepatic Coma, Acute Or Unspecified	070.20
Viral Hepatitis B With Hepatic Coma, Acute Or Unspecified, With Hepatitis Delta	070.21
Viral Hepatitis B, Acute Or Unspecified, With Hepatitis Delta	070.31
Acute Hepatitis C With Hepatic Coma	070.41
Hepatitis Delta Without Mention Of Active Hepatitis B Disease With Hepatic Coma	070.42
Hepatitis E With Hepatic Coma	070.43
Unspecified Viral Hepatitis C Without Hepatic Coma	070.70
Hepatitis In Viral Diseases Classified Elsewhere	573.1
Carrier Or Suspected Carrier Of Viral Hepatitis	V02.60
Need For Prophylactic Vaccination And Inoculation Against Viral Hepatitis	V05.3
Chronic Viral Hepatitis B Without Mention Of Hepatic Coma Or Hepatitis Delta	070.32
Viral Hepatitis B With Hepatic Coma, Chronic, Without Mention Of Hepatitis Delta	070.22
Viral Hepatitis B With Hepatic Coma, Chronic, With Hepatitis Delta	070.23
Viral Hepatitis B Without Mention Of Hepatic Coma, Chronic, With Hepatitis Delta	070.33
Other Icd9 Viral Hepatitis Carrier	V02.69
Unspecified Viral Hepatitis C With Hepatic Coma	070.71

Note 26 Include primary sclerosing cholangitis diagnosis (1 item)

Sclerosing cholangitis description	ICD-9 code
Cholangitis	576.1

Note 27 Include organ transplantation diagnosis and therapeutic operations for liver only (64 items)

Organ transplantation and liver therapeutic operation descriptions	ICD-9 codes
Compl kidney transplant	996.81
Compl liver transplant	996.82
Compl heart transplant	996.83
Compl lung transplant	996.84
Complications of bone marrow transplant	996.85
Compl pancreas transplnt	996.86
Complications of other transplanted organ	996.89
Complication of intestine transplantation	996.87
Complications of transplanted organ	996.88
Complications of transplanted organ	996.80
Kidney replaced by transplant	V42.0
Heart replaced by transplant	V42.1
Heart valve replaced by transplant	V42.2
Skin replaced by transplant	V42.3
Bone replaced by transplant	V42.4
Cornea replaced by transplant	V42.5
Lung replaced by transplant	V42.6
Liver replaced by transplant	V42.7
Other specified organ or tissue replaced by transplant	V42.89
Bone marrow replaced by transplant	V42.81
Peripheral stem cells replaced by transplant	V42.82
Pancreas replaced by transplant	V42.83

Organ transplantation and liver therapeutic operation descriptions	ICD-9 codes
Intestines replaced by transplantation	V42.84
Unspecified organ or tissue replaced by transplant	V42.9
Allogeneic bone marrow transplant with purging	41.02
Allogeneic bone marrow transplant without purging	41.03
Cord blood stem cell transplant	41.06
Autologous hematopoietic stem cell transplant with purging	41.07
Allogeneic hematopoietic stem cell transplant	41.08
Autologous bone marrow transplant with purging	41.09
Autologous bone marrow transplant without purging	41.01
Autologous hematopoietic stem cell transplant without purging	41.04
Allogeneic hematopoietic stem cell transplant without purging	41.05
Bone marrow transplant	41.00
Unilat lung transplant	33.51
Bilateral lung transplantation	33.52
Lung transplantation	33.50
Reimplantation of pancreatic tissue	52.81
Homotransplant of pancreas	52.82
Heterotransplant of pancreas	52.83
Autotransplantation of cells of islets of langerhans	52.84
Allotransplantation of cells of islets of langerhans	52.85
Transplantation of cells of islets of langerhans	52.86
Operations on pancreas: pancreatic transplant	52.80
Hepatotomy	50.0
Marsupialization of lesion of liver	50.21
Partial hepatectomy	50.22
Lobectomy of liver	50.3
Total hepatectomy	50.4
Auxiliary liver transplant	50.51
Other transplant of liver	50.59
Closure of laceration of liver	50.61
Other repair of liver	50.69
Percutaneous aspiration of liver	50.91
Extracorporeal hepatic assistance	50.92
Localized perfusion of liver	50.93
Other injection of therapeutic substance into liver	50.94
Unlisted proc	50.99
Open ablation of liver lesion or tissue	50.23
Percutaneous ablation of liver lesion or tissue	50.24
Laparoscopic ablation of liver lesion or tissue	50.25
Other and unspecified ablation of liver lesion or tissue	50.26
Other destruction of lesion of liver	50.29

Note 28 Include all death diagnoses (3 items)

Death diagnosis descriptions	ICD-9 codes
Instantaneous death	798.1
Death occurring in less than 24 hours from onset of symptoms	798.2
Unattended death	798.9

Note 29 Include all overdose diagnoses (13 items)

Overdose diagnosis descriptions	ICD-9 codes
Suicide and self-inflicted poisoning by solid and liquid substances	E950.9
Suicide/self-inflicted poisoning by analgesics, antipyretics, and antirheumatics	E950.0
Suicide and self-inflicted poisoning by barbiturates	E950.1
Suicide and self-inflicted poisoning by other sedatives and hypnotics	E950.2
Suicide/self-inflicted poisoning by tranquilizers and other psychotropic agents	E950.3
Suicide/self-inflicted poisoning by other drugs and medicinal substances	E950.4
Suicide and self-inflicted poisoning by unspecified drug or medicinal substance	E950.5

Overdose diagnosis descriptions	ICD-9 codes
Suicide/self-inflicted poisoning by agricultural/horticultural chemical	E950.6
Suicide and self-inflicted poisoning by corrosive and caustic substances	E950.7
Suicide and self-inflicted poisoning by arsenic and its compounds	E950.8
Suicide and self-inflicted injury by other specified means	E958.8
Late eff of self-injury	E959.
Suicide and self-inflicted injury by unspecified means	E958.9

Note 30 For E1-No patients, we exclude patients that were never *administered* (started on) a medication represented in algorithm selected cases (see Note 10 for a list of medication preparations). Date of administration is estimated by both of the following (also see *Figure 2*):

- a. Date medication is ordered.
- b. Date medication is mentioned in clinical note (using NLP). (NOTE: Specific notes and use of NLP is institution specific. See institution implementation details.)

Note 31 For E2-Yes patients, excluded “other diagnoses” should be the same “other diagnoses” that are used in the DILI cases algorithm (See “Drug-induced liver injury algorithm – Cases”)

Appendix 1: Expanded list of medications

- 341 Medication Preparations listed on LiverTox.nih.gov (NOTE: This list does not include all medications, herbals and dietary supplements)

Preparations	UMLS CUIs
6-mercaptopurine preparations	C0000618
Acebutolol preparations	C0036543
Acetazolamide preparations	C0591362
Acetohexamide preparations	C0000992
Acyclovir preparations	C0592290
Albuterol preparations	C0699770
Albuterol preparations	C0699770
Alendronate preparations	C0376569
Allopurinol preparations	C0002144
Alprazolam preparations	C0699034
Amantadine preparations	C0026055
Amiloride preparations	C0026054
Amiodarone preparations	C0010005
Amitriptyline preparations	C0600048
Amlodipine besylate preparations	C0162712
Amobarbital preparations	C0592120
Amoxicillin / clavulanates combination preparations	C0591132
Amoxicillin preparations	C0041058
Amphotericin b preparations	C0281209
Ampicillin preparations	C0147814
Anastrozole preparations	C0290883
Atenolol preparations	C0592168
Atorvastatin preparations	C0593906
Atovaquone preparations	C0378468
Auranofin preparations	C0699923
Azathioprine preparations	C0699279
Azithromycin preparations	C0678143
Aztreonam preparations	C0699281
Baclofen preparations	C0699999
Benzotropine preparations	C0591275

Preparations	UMLS CUIs
Betamethasone preparations	C0053523
Betaxolol preparations	C0678122
Bicalutamide preparations	C591237
Bumetanide preparations	C0006376
Bupropion preparations	C0085934
Busulfan preparations	C0700015
Capreomycin preparations	C0305547
Captopril preparations	C0591224
Carbamazepine preparations	C0700087
Carbenicillin preparations	C0142817
Carboplatin preparations	C0591953
Carisoprodol preparations	C0599444
Cascara preparations	C0205704
Cefaclor preparations	C0007537
Cefepime preparations	C0284915
Cefixime preparations	C0678177
Cefoperazone preparations	C0039184
Cefotaxime preparations	C0035912
Cefoxitin preparations	C0025154
Cefpodoxime preparations	C0108938
Cefprozil preparations	C0053882
Ceftazidime preparations	C0007559
Ceftizoxime preparations	C0282391
Ceftriaxone preparations	C0035750
Cefuroxime preparations	C0043480
Cephalexin preparations	C0022543
Cephalosporin preparations	C0007732
Cephradine preparations	C0699948
Chlorambucil preparations	C0699996
Chlordiazepoxide preparations	C0013881
Chloroquine preparations	C0055447
Chlorothiazide preparations	C0008273
Chlorpromazine preparations	C0699065
Chlorpropamide preparations	C0591359
Chlorthalidone preparations	C0008294
Cimetidine preparations	C0592157
Ciprofloxacin preparations	C0282104
Cisplatin preparations	C0699666
Clarithromycin preparations	C0055856
Clinafloxacin preparations	C0070191
Clindamycin preparations	C0699673
Clofibrate preparations	C0591129
Clomipramine preparations	C0002752
Clonazepam preparations	C0699315
Clonidine preparations	C0699881
Clorazepate dipotassium preparations	C0699937
Clozapine preparations	C0009079
Cocaine preparations	C0274659
Colchicine preparations	C0009262
Colestipol preparations	C0305681
Cortisone acetate preparations	C0056391
Cyclobenzaprine preparations	C0125988
Cyclophosphamide preparations	C0699319
Cycloserine preparations	C0010590
Cyclosporin a preparations	C0699605
Cyproheptadine preparations	C0031017
Danazol preparations	C0010961
Dantrolene sodium preparations	C0010975

Preparations	UMLS CUIs
Dapsone preparations	C0010980
Demeclocycline hydrochloride preparations	C0282125
Desflurane preparations	C0592148
Desipramine preparations	C0031232
Dexamethasone preparations	C0011777
Diazepam preparations	C0699187
Diclofenac sodium preparations	C0699958
Dicloxacillin preparations	C0013350
Dicyclomine preparations	C0700023
Didanosine preparations	C0592249
Diflunisal preparations	C0699201
Diltiazem preparations	C0376307
Dimenhydrinate preparations	C0591410
Diphenhydramine preparations	C0305423
Dipyridamole preparations	C0700020
Disopyramide phosphate preparations	C0086167
Disulfiram preparations	C0591096
Docetaxel preparations	C0699967
Donepezil hydrochloride preparations	C0527315
Doxazosin mesylate preparations	C0678136
Doxepin preparations	C0037172
Doxycycline hyclate preparations	C0699957
Enalapril maleate preparations	C0014027
Enflurane preparations	C0014277
Enoxaparin preparations	C0206460
Erythromycin preparations	C0699340
Esmolol hydrochloride preparations	C0591189
Ethambutol preparations	C0026895
Ethinyl estradiol preparations	C0699362
Ethosuximide preparations	C0699966
Etodolac preparations	C0700001
Famciclovir preparations	C591478
Famotidine preparations	C0678119
Felbamate preparations	C0060135
Felodipine preparations	C0700021
Fexofenadine hydrochloride preparations	C0528314
Finasteride preparations	C0678149
Flecainide acetate preparations	C0592158
Fluconazole preparations	C0699601
Flucytosine preparations	C0016278
Fluoxetine hydrochloride preparations	C0162373
Fluoxymesterone preparations	C0016366
Fluphenazine preparations	C0066682
Flurazepam preparations	C0242293
Flutamide preparations	C0016384
Fluvastatin preparations	C0591720
Fluvoxamine preparations	C86307
Foscarnet preparations	C0146934
Fosinopril preparations	C0543474
Furosemide preparations	C0699992
Gabapentin preparations	C0678176
Ganciclovir preparations	C0017066
Gemfibrozil preparations	C0700003
Gentamicin preparations	C0699089
Glimepiride preparations	C0595112
Glipizide preparations	C0017642
Glucagon preparations	C0337437
Glyburide preparations	C0017628

Preparations	UMLS CUIs
Glycopyrrolate preparations	C0592075
Gold sodium thiomalate preparations	C0700008
Griseofulvin preparations	C0018242
Haloperidol preparations	C0591585
Halothane preparations	C0018549
Histamine phosphate preparations	C0062740
Hydralazine preparations	C0699178
Hydrochlorothiazide preparations	C0020261
Hydrocortisone preparations	C0591101
Hydroxychloroquine preparations	C0699177
Hydroxyzine preparations	C0684229
Hyoscyamine sulfate preparations	C0306621
Ibuprofen preparations	C0699203
Ifosfamide preparations	C0020823
Imipramine preparations	C0025231
Indinavir preparations	C0254245
Indomethacin preparations	C0021246
Interferon beta 1a preparations	C0594372
Ipratropium bromide preparations	C0591130
Isoflurane preparations	C0306242
Isoniazid preparations	C0022209
Isotretinoin preparations	C699581
Isradipine preparations	C0071304
Itraconazole preparations	C0699614
Ketoconazole preparations	C0699439
Ketoprofen preparations	C0591927
Ketorolac tromethamine preparations	C0592931
Labetalol preparations	C0592195
Lamivudine preparations	C0667846
Lamotrigine preparations	C678180
Lansoprazole preparations	C286036
Levodopa preparations	C0699991
Levofloxacin preparations	C0282386
Lisinopril preparations	C0678140
Lithium carbonate preparations	C0085217
Lithium citrate preparations	C0125997
Lomustine preparations	C0699181
Loratadine preparations	C0065180
Lorazepam preparations	C0699194
Losartan potassium preparations	C0591301
Lovastatin preparations	C0024027
Loxapine preparations	C0024057
Mebendazole preparations	C0699951
Mechlorethamine preparations	C0600267
Meclizine preparations	C0005985
Mefloquine preparations	C0699989
Melphalan preparations	C0591063
Meropenem preparations	C0286095
Metaproterenol sulfate preparations	C0591074
Metformin preparations	C0591573
Methazolamide preparations	C0025631
Methicillin preparations	C0038155
Methimazole preparations	C0025644
Methocarbamol preparations	C0699926
Methotrexate preparations	C0025677
Methyldopa preparations	C0025741
Methylphenidate preparations	C0282237
Methylprednisolone preparations	C0086618

Preparations	UMLS CUIs
Metolazone preparations	C0025854
Metoprolol tartrate preparations	C0005307
Metronidazole preparations	C0699681
Mexiletine preparations	C0600129
Midazolam hydrochloride preparations	C0042553
Minocycline preparations	C0591806
Minoxidil preparations	C0699464
Mirtazapine preparations	C0525726
Molindone preparations	C0282249
Moxifloxacin preparations	C0536495
Mycophenolate preparations	C0592558
Nabumetone preparations	C0068334
Nadolol preparations	C0591292
Naltrexone hydrochloride preparations	C0027360
Nandrolone decanoate preparations	C0068395
Naproxen preparations	C0700017
Nefazodone hydrochloride preparations	C0553415
Nelfinavir preparations	C0525004
Neomycin preparations	C0027607
Nevirapine preparations	C0132326
Niacin preparations	C0027996
Nicardipine hydrochloride preparations	C0591233
Nifedipine preparations	C0524665
Nimodipine preparations	C0678207
Nitrofurantoin preparations	C0700187
Nizatidine preparations	C0678129
Norfloxacin preparations	C0699473
Nortriptyline preparations	C0030256
Ofloxacin preparations	C0699173
Olanzapine preparations	C0527258
Omeprazole preparations	C0028978
Orphenadrine / aspirin / caffeine combination preparations	C0068991
Orphenadrine citrate preparations	C0687683
Oxandrolone preparations	C0029995
Oxaprozin preparations	C0603695
Oxazepam preparations	C0029997
Oxybutynin preparations	C0591395
Paclitaxel preparations	C0678133
Pamidronate disodium preparations	C0104018
Penicillamine preparations	C0699483
Penicillin g preparations	C0030830
Pergolide mesylate preparations	C0031008
Perphenazine preparations	C0699490
Phenelzine sulfate preparations	C0031393
Phenytoin preparations	C0305916
Pimozide preparations	C0591918
Pindolol preparations	C0699962
Piperacillin / tazobactam combination preparations	C0250482
Piperacillin preparations	C0008877
Piroxicam preparations	C0687717
Pramipexole preparations	C0138214
Pravastatin sodium preparations	C0086844
Praziquantel preparations	C0032911
Prazosin preparations	C0242447
Prednisolone preparations	C0699633
Prednisone preparations	C0032952
Primaquine phosphate preparations	C0033126
Primidone preparations	C0700016

Preparations	UMLS CUIs
Probenecid preparations	C0591159
Procainamide preparations	C0392424
Procarbazine preparations	C0205909
Prochlorperazine edisylate salt preparations	C0033231
Prochlorperazine maleate preparations	C0033231
Propafenone hydrochloride preparations	C0282316
Propranolol hydrochloride preparations	C0033448
Propofol preparations	C0678120
Propranolol preparations	C0591638
Propylthiouracil preparations	C0033511
Pyrazinamide preparations	C0034239
Pyrimethamine/ sulfadoxine combination preparations	C0060061
Quetiapine preparations	C0287163
Quinapril hydrochloride preparations	C0244580
Quinidine gluconate preparations	C0072869
Quinidine sulfate preparations	C0034415
Quinine sulfate preparations	C0034422
Ranitidine preparations	C0592278
Reserpine preparations	C0035179
Ribavirin preparations	C0035525
Rifabutin preparations	C0678142
Rifampin preparations	C0699925
Riluzole preparations	C0678179
Rimantadine preparations	C0282336
Risperidone preparations	C0592071
Ritonavir preparations	C0678152
Salmeterol xinafoate preparations	C0245531
Saquinavir mesylate preparations	C0286737
Scopolamine hydrobromide preparations	C0306494
Secobarbital preparations	C0592104
Selegiline hcl preparations	C0306054
Senna preparations	C0699932
Sertraline hydrochloride preparations	C0284660
Simvastatin preparations	C0678181
Sotalol hydrochloride preparations	C0026289
Sparfloxacin	C0052585
Spiroonolactone preparations	C0037982
Stavudine preparations	C0164662
Streptomycin sulfate preparations	C0038425
Sulfamethoxazole / trimethoprim combination preparations	C0699595
Sulfisoxazole preparations	C0038745
Sulindac preparations	C0591267
Tacrine preparations	C0699954
Tacrolimus (fk 506) preparations	C0678125
Tamoxifen citrate preparations	C0079589
Terazosin preparations	C0122938
Terbinafine preparations	C0076110
Terbutaline sulfate preparations	C0039543
Theophylline preparations	C0039771
Thiabendazole preparations	C0700007
Thioguanine preparations	C0039902
Thioridazine preparations	C0306772
Ticarcillin preparations	C0699871
Ticlopidine hydrochloride preparations	C0000598
Timolol preparations	C0040235
Tizanidine preparations	C0595425
Tolbutamide preparations	C0040374
Tolmetin preparations	C0087097

Preparations	UMLS CUIs
Torseamide preparations	C0243946
Tranlycypromine preparations	C0304369
Trazodone preparations	C0282369
Triamcinolone preparations	C0077004
Trimethoprim Preparations	C0041041
Triamterene preparations	C0040869
Triazolam preparations	C0040879
Trifluoperazine preparations	C0038245
Trihexyphenidyl preparations	C0591114
Trimethoprim preparations	C0041041
Trovaflaxacin preparations	C0379881
Valacyclovir hydrochloride preparations	C0592245
Valproic Acid preparations	C0304356
Vancomycin preparations	C0699052
Venlafaxine preparations	C0148888
Verapamil preparations	C0022246
Vincristine sulfate preparations	C0042679
Vinorelbine tartrate preparations	C0131965
Warfarin preparations	C0699129
Zafirlukast preparations	C0526502
Zidovudine preparations	C0667846