

Appendix 1: Mapping to Body System or Etiology Groups

Body System or Etiology Group	Hospital Discharge data	Outpatient pharmacy data	Home health care	Specialty visits
Cancer	<p>Neoplasm, Malignant: Cardiovascular, Hypopharynx, Oral Cavity, Oropharynx, Salivary Glands and Mandible, Other Endocrine System, Larynx, Glottis, Larynx, Subglottic, Larynx, Supraglottic, Nasopharyngeal, Sinuses, Ocular Melanoma, Other Eye and Periocular, Colon and Rectum, Esophagus, Small Bowel, Stomach, Other Gastrointestinal System, Bladder, Urinary, Kidneys, Other Genitourinary System, Breast (Female), Cervix Uteri, Endometrium, Ovaries, Vagina, Vulva, Other Female Genitalia, Hodgkin's Lymphoma, Multiple Myeloma, Mastocytosis, Pancreas, Other Hepatobiliary Tract, Breast (Male), Penile, Prostate, Testicular, Primary Bone, Waldenstrom's Macroglobulinemia, Nonspecific Sites, Unspecified Primary Site, Lungs, Bronchi, or Mediastinum, Hodgkin's Disease Lymphocytic Depletion, Hodgkin's Disease Lymphocytic Predominance, Hodgkin's Disease Mixed Cellularity, Hodgkin's Disease Nodular Sclerosis, Lymphatic and Hematopoietic (Other Types), Lymphoma, Cutaneous T Cell (Mycosis Fungoides), Lymphoma (Diffuse Mixed Small and Large Cell), Lymphoma (Diffuse Large Cell), Lymphoma (Follicular Predominantly Large Cell), Lymphoma (Histiocytic Cell), Lymphoma (Lymphoblastic), Other Respiratory System, Carcinoma (Basal Cell stage 2/3), Carcinoma (Squamous Cell), Melanoma, Other Skin and Soft</p>	<p>Antineoplastics 5HT3 Antagonists</p>	<p>2005-2009: Visits prescribed due to the presence of cancer. Beginning in 2010, the following ICD-9-CM codes were in the record: 140-208, 235-239, V10, V16</p>	<p>Visits prescribed for radiation therapy, or for Injection or infusion of chemotherapeutic Substances for cancer treatment</p>

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	<p>Tissue Neoplasm: Pheochromocytoma, Eyelid, Central Nervous System, Lymphatic or Hematopoietic Leukemia: Acute Lymphocytic, Acute Nonlymphocytic, Chronic Lymphocytic, Chronic Myelogenous, Other Types Encounter for: Chemotherapy, Radiation Therapy ICD-9-CM Procedure codes: 99.25, 99.28, 00.10,00.15,92.2x</p>			
Cardiovascular	<p>Aneurysm: Abdominal, Thoracic Anomaly: Patent Ductus Arteriosus, Atrial Septal Defect, Atrioventricular Defects, Coarctation of the Aorta, Other Congenital Heart Disease, Pulmonary Valve Stenosis, Tetralogy of Fallot (stage 3), Transposition of the Great Arteries, Ventricular Septal Defects, Other Circulatory System Aortic: Regurgitation, Stenosis Mitral: Regurgitation, Stenosis Neoplasm: Benign of the Cardiovascular System Arrhythmias, Cardiomyopathies, Conduction Disorders, Congestive Heart Failure, Coronary Artery Disease Prior Coronary Revascularization, Coronary Artery Disease w/o Prior, Coronary Revascularization, Essential Hypertension, Infective, Endocarditis, Pericarditis: Chronic (stage 2/3), Viral or Traumatic (stage 2/3) Periarteritis Nodosa, Raynaud's Disease, Thromboangiitis,</p>	<p>Oral anti-coagulants beta-blockers ACE/ARB anti-platelets calcium channel blockers anti-arrhythmics digitalis glycosides nitrates diuretics alfa-blockers statins</p>	<p>2005-2009: Visits prescribed due to the presence of Congestive Heart Failure or not-well defined cardiopathy, and other diseases of cardiovascular system. Beginning in 2010, the following ICD-9-CM-CM codes were in the record: 390-454,456-459</p>	

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	<p>Obliterans, Thrombophlebitis, Tibial, Iliac, Femoral, or Popliteal Artery Disease, Varicose Veins of Lower Extremities, Secondary Hypertension, Budd Chiari Syndrome, Rheumatic Fever (stage 2/3) Vasculitis Other: Atherosclerosis, Cardiac Conditions, Cardiovascular Symptoms, Circulatory Disorders, Diseases of Arteries, Diseases of Veins, Disorders of Pulmonary Circulation, Lymphatic Disorders</p>			
Endocrine	<p>Adrenal Insufficiency, Cushing's Syndrome, Diabetes insipidus, Diabetes Mellitus Type 1, Diabetes Mellitus Type 2 and Hyperglycemic States,Hyperthyroidism, Hypoglycemia, Hypothyroidism, Monotropic Hormone Deficiency, Primary Amyloidosis, Thyroiditis, Klinefelter's Syndrome, Turner's or Noonan's Syndrome, Obesity Goiter: Nontoxic or Euthyroid (stage 2/3) Neoplasm, Benign: Acromegaly, Adenoma, Parathyroid, Hyperparathyroidism, Primary Hyperaldosteronism, Other Endocrine System Neoplasm, Malignant:Thyroid Other: Endocrine Disorders, Electrolyte Disorders, Nutritional and Metabolic Disorders Anomaly: Adrenal Hyperplasia</p>	<p>Insulins biguanides sulfonylureas vasopressin thyroid replacement antithyroid agents</p>	<p>2005-2009: Visits prescribed due to the presence of diabetes mellitus Beginning in 2010, the following ICD-9-CM codes were in the record: 240-278</p>	

Body System or Etiology Group	Hospital Discharge data	Outpatient pharmacy data	Home health care	Specialty visits
Ear, Nose, Throat	Diseases of Salivary Gland, Incl. Parotitis or Benign Tumors, Other Disorders of Oral Cavity (stage 2), Cholesteatoma, Meniere's Disease, Otitis Media, Sinusitis Hearing Loss due to: Acoustic Trauma, Otosclerosis Neoplasm, Benign: Larynx, Sinuses, Oral Cavity and Pharyngeal Structures Pharyngitis: Non-Streptococcal (stage 2)			
Eye	Cataract, Conjunctivitis: Bacterial, Contusion or Ruptured Globe, Dacryostenosis or Dacryocystitis, Detachment of the Retina, Ectropion or Entropion (Abnormal Lower Lid Position), Endophthalmitis, Foreign Body: Orbit, Fracture: Orbit, Blow-Out, Fungal Infection of the Eye, Glaucoma, Hypovitaminosis A, Laceration: Cornea, Macular Degeneration, Orbital Infection, Prematurity: Retinopathy, Ptosis of Upper Lid, Retrobulbar Orbital Hemorrhage, Trachoma, Other Eye Disorders Injury or Laceration: Eyelid, Periocular, Cornea, Conjunctiv Injury: Eyes, Nonionizing Radiation Keratitis: Acanthamoeba, Bacterial Neoplasm, Benign: Eye	Sympaticomimetic agents parasympaticomimetic agents anhydrase inhibitors ophthalmic beta blockers		
Gastrointestinal	Anorectal Suppuration, Celiac Disease, Clostridium difficile Colitis, Crohn's Disease, Diverticular Disease, Food Poisoning: Other Organisms (stage 3), Functional Digestive Disorders, Gastritis, Hemorrhoids, Hernia (External), Hernia (Hiatal or Reflux Esophagitis), Intussusception (stage 2), Irritable Bowel Syndrome, Gastroenteritis	Intestinal corticosteroids agents H2 antagonists prostaglandins proton pump inhibitors	2005-2009: Visits prescribed due to the presence of Gastrointestinal Diseases Beginning in 2010,	

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	<p>Neoplasm, Benign: Adenomatous Polyps, Colon, Small Bowel, Other Gastrointestinal System</p> <p>Peptic Ulcer Disease, Salmonellosis (stage 3), Ulcerative Colitis, Vascular Insufficiency of the Bowels, Complications of Gastrointestinal Treatment, Gastroenteritis (stage 2/3)</p> <p>Other Diseases of Esophagus, Stomach, and Duodenum</p> <p>Other Gastrointestinal Disorders, Other Gastrointestinal Infections (stage 2), Other Gastrointestinal or Abdominal Symptoms</p> <p>Anomaly: Congenital Megacolon, Other Digestive or Hepatobiliary System</p> <p>Burns, Chemical: Esophagus, Stomach, or Small Intestine, Laceration: Esophagus</p>		<p>the following ICD-9-CM codes were in the record: 520-539,550-579</p>	
Genitourinary	<p>Bladder Disorders, Calculus of the Urinary Tract, Glomerulonephritis, Acute, Injury: Urinary Tract, Nephrotic Syndrome (stage 2/3), Renal Failure (stage 2/3), Urethritis, Urinary Tract Infections, Neoplasm, Benign: Urinary Tract, Other Disorders of Kidney or Ureter, Other Urinary Symptoms, Encounter for Dialysis, Anomaly: Defects of Kidney, Defects of Lower Genitourinary Tract, Syphilis: Congenital</p>	<p>Agents for hyperkalemia and hyperphosphatemia</p>	<p>2005-2009: Visits prescribed due to the presence of renal failure and Other diseases of the genito-urinary system</p> <p>Beginning in 2010, the following ICD-9-CM codes were in the record: 580-629</p>	<p>Visits prescribed for dialysis</p>

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Gynecological and Obstetrics	Anomaly: External Female Genitalia, Anomaly: Uterus, Dysfunctional Uterine Bleeding, Endometriosis, Neoplasm, Benign: Ovary (stage 2), Pelvic Inflammatory Disease, Uterine Infection, Uterovaginal Prolapse, Vulvovaginitis, Other Disorders of Female Genital System			
Hematological	Agranulocytosis, Anemia: Aplastic, Acquired (stage 2/3), Folic Acid Deficiency, Hemolytic (stage 2/3), Iron Deficiency, Sickle Cell, Thalassemia, Vitamin B-12 Deficiency, Other Graft versus Host reaction, Hemophilia A or B, Polycythemia Vera, Other Disorders of Blood and Blood-Forming Organs	Iron vitamin B12 folic acids	Beginning in 2010, the following ICD-9-CM codes were in the record: 280-289	
Hepatobiliary	Cholecystitis and Cholelithiasis, Cirrhosis of the Liver (stage 2/3), Disorders of Bilirubin Excretion, Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, Hepatitis E, Hepatitis G, Hepatitis (Chemical), Pancreatitis, Wilson's Disease, Neoplasm, Benign: Hepatobiliary System, Other Hepatobiliary and Pancreatic Disorders, Other Hepatobiliary Infections, Other Pancreatic Disorders	Interferons blood substitutes and plasmatic protein fractions		
Immunologic Diseases	Human Immunodeficiency Virus Type I (HIV) Infection, Other Immunodeficient Disorders, Pneumonia: Pneumocystis carinii	Nucleosides and nucleotides reverse transcriptase inhibitors	2005-2009: Visits prescribed due to HIV Infections Beginning in 2010, the following ICD-9-CM codes were in the record: 279	

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Infectious Diseases	Aspergillosis, Chlamydial Infection Except Trachoma or Pneumonia, Cryptococcosis, Cytomegalovirus Disease (Acquired), Infectious Mononucleosis (stage 2), Mucormycosis, Reye's Syndrome (stage 3), Rubella: Acquired (stage 3), Schistosomiasis, Other Bacterial Infections, Other Fungal Infections, Other Infectious and Parasitic Infections, Other Viral Infections, Cytomegalovirus Disease (Congenital), Parainfluenza Virus Infection, Pneumonia: Chlamydial, Sarcoidosis, Other Respiratory Infections, Scabies		Beginning in 2010, the following ICD-9-CM codes were in the record: 001-139	
Male Genital	Benign Prostatic Hypertrophy, Gonorrhea: Male, Prostatitis	Alfa-adrenoreceptor antagonists testosterone 5-alfa reductase inhibitors		
Musculoskeletal	Vitamin D Deficiency, Dislocation: Knee, Eosinophilia Myalgia Syndrome, Fracture: Acetabulum, Fracture: Calcaneus (stage 2), Fracture: Femur, Except Head or Neck, Fracture: Femur, Head or Neck, Fracture: Fibula (stage 2), Fracture: Humerus (Shaft), Fracture: Humerus (Supracondylar) (stage 2), Fracture: Radial Shaft, Ulna or Olecranon (stage 2), Fracture: Radius, Lower End (stage 2), Fracture: Tibia (stage 2/3), Fracture or Dislocation: Patella (stage 2), Fracture or Sprain: Ankle (stage 2), Fracture, Dislocation, or Sprain: Facial Bones (stage 2/3), Fracture, Dislocation, or Sprain: Foot (stage 2), Fracture, Dislocation, or Sprain: Hip or Pelvis (stage 2/3), Fracture, Dislocation, or	Colchicine uric acid inhibitors antiinflammatory non-steroids gold salts aminoquinolines bisphosphonates calcitonin	2005-2009: Visits prescribed due to the presence of Arthrosis, Arthritis and other osteo-muscular and connective diseases, and Fractures of femurs and other consequences of fractures.	

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	<p>Sprain: Humerus (Head) or Shoulder (stage 2), Fracture, Dislocation, or Sprain: Wrist or Hand or Fingers (stage 2), Gout, Herniated Intervertebral Disc, Infectious Arthritis (stage 2/3), Injury, Chest Wall, Injury, Knee, Semilunar Cartilages (stage 2), Injury, Open Wound, or Blunt Trauma: Lower Extremity (stage 2), Injury, Open Wound, or Blunt Trauma: Upper Extremity (stage 2/3), Muscular Dystrophy, Osteoarthritis, Osteochondrodysplasia, Osteomalacia, Osteomyelitis (stage 2/3), Osteoporosis, Progressive Systemic Sclerosis, Rheumatoid Arthritis, Scoliosis of the Thoracic Spine, Spondylitis, Ankylosing, Systemic Lupus Erythematosus, Anomaly: Musculoskeletal System, Injury: Other and Ill-Defined Musculoskeletal Sites, Neoplasm, Benign: Musculoskeletal Syst. or Connective Tissue, Other Arthropathies, Bone and Joint Disorders, Other Disorders of Connective Tissue, Other Spinal and Back Disorders, Myasthenia Gravis, Complications of Surgical and Medical Care (stage 1), Injury, Open Wound, or Blunt Trauma: Abdomen or Trunk (stage 2/3), Injury: Other (stage 3)</p>		<p>Beginning in 2010, the following ICD-9-CM codes were in the record: 710-739</p>	
Neurologic Diseases	<p>Down's Syndrome, Herpes zoster, Poliomyelitis, Post-Polio Syndrome, Syphilis: Acquired, Tetanus (stage 1), Toxoplasmosis: Acquired (stage 3), Amyotrophic Lateral Sclerosis, Cerebral Palsy, Cerebrovascular Disease, Disease of Nervous System Secondary to Implants or Grafts, Epilepsy, Guillain-Barre Syndrome (stage 2), Headache (stage 2), Huntington's Chorea, Injury: Craniocerebral,</p>	<p>Anticholinesterase agents anticonvulsivant barbiturates and congeners alprostadil ergot alkaloids 5HT1 agonists dopamine</p>	<p>2005-2009: Visits prescribed due to the presence of Dementia and Alzheimer's syndrome, Parkinson's and</p>	

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	<p>Injury: Spine and spinal cord, Meningitis, Encephalitis, and Myelitis: Viral, Meningitis: Bacterial, Mental Retardation, Multiple Sclerosis, Neurofibromatosis Type I [Von Recklinghausen's Disease], Parkinson's Disease, Other CNS Inflammation, Infection, or Disorder, Other Cranial Nerve Disorders, Other Neurological Conditions, Other Peripheral Nerve Disorders, Other Spinal Lesions, Anomaly: Neural Tube Defects, Rubella: Congenital (stage 2), Anomaly: Other Nervous System, Injury: Other</p>	<p>MAO b inhibitors</p>	<p>other CNS degenerative disease, hemiplegia, monoplegia, and other associated syndroms, and acute and chronic cerebrovascular diseases Beginning in 2010, the following ICD-9-CM codes were in the record: 320-389,797</p>	
<p>Psychological</p>	<p>Dementia: Primary Degenerative (Alzheimer's or Pick's), Antisocial Personality Disorder, Bipolar Disorder - Major Depressive Episode, Bipolar Disorder - Manic Episode, Depression, Generalized Anxiety Disorder, Obsessive-Compulsive Neurosis, Schizophrenia, Autism, Other Neuroses, Other Psychoses Drug Abuse, Dependence, Intoxication: Alcohol, Amphetamine, Barbiturate, Cannabis, Cocaine, Hallucinogen, Opioid, Other Eating disorders: Anorexia Nervosa, Bulimia Nervosa</p>	<p>Antidepressants antipsychotics agents</p>	<p>2005-2009: Visits prescribed due to the presence of psychoses, neuroses, and mental retardation Beginning in 2010, the following ICD-9-CM codes were in the record: 290-319</p>	

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Respiratory	Coxsackie and ECHO Infections (stage 2/3), Anomaly: Tracheoesophageal Malformations, Asbestosis, Asthma, Berylliosis, Byssinosis, Chronic Obstructive Pulmonary Disease, Coal Miner's Pneumoconiosis, Croup, Cystic Fibrosis, Emphysema, Hypersensitivity Pneumonitis, Influenza, Mycoplasma pneumoniae Infection, Parainfluenza Virus Infection (stage 2), Pneumonia: Bacterial, Pneumonia: Legionella, Pulmonary Alveolar Proteinosis, Pulmonary Embolism (stage 3), Radiation Pneumonitis, Silicosis, Tuberculosis, Complications of Tracheostomy, Other Disorders of Respiratory System, Other Respiratory Disease Due to External Agents, Other Respiratory Symptoms, Pneumonia: Aspiration, Neoplasm, Benign: Respiratory System	Inhaled corticosteroids beta-2-adrenoreceptor agonists xanthines leucotrienies antagonists cromolyn pancreatic enzymes mucolytics antituberculosis antibiotics isoniazid	2005-2009: Visits prescribed due to the presence of respiratory diseases Beginning in 2010, the following ICD-9-CM codes were in the record: 460-519	
Skin	Herpes Virus Ocular Infection (stage 1), Urticaria, Candida (Monial) Infections, Clostridial Wound Infection (stage 2), Herpes Simplex Infections, Complications of Surgical and Medical Care (stage 2/3), Anomaly: Integument (Genodermatoses), Decubitus Ulcers, Erythema Multiforme, Erythroderma, Immunologically Mediated Blistering Skin Diseases, Infections of Skin and Subcutaneous Tissue, Neoplasm, Malignant: Carcinoma, Basal Cell (stage 1), Neoplasm: Atypical Nevus (stage 1), Psoriasis Vulgaris, Other Inflammations & Infections of Skin & SubQ Tissue, Burns, Neoplasm, Benign: Skin or Subcutaneous Tissue (stage 1)	Oral and topical antipsoriasis agents	2005-2009: Visits prescribed due to the presence of decubitus ulcers and othere skin diseases Beginning in 2010, the following ICD-9-CM codes were in the record: 680-709	