

S4 Table. Descriptions of the parent category ICD-10 diagnosis codes mapped to each condition of the Elixhauser Comorbidity Index.

Comorbidity	ICD-10 Definition
Alcohol abuse	E52 - Niacin deficiency [pellagra] F10 - Alcohol related disorders G62 - Other and unspecified polyneuropathies I42 - Cardiomyopathy K29 - Gastritis and duodenitis K70 - Alcoholic liver disease T51 - Toxic effect of alcohol Z71 - Persons encountering health services for other counseling and medical advice, not elsewhere classified Z72 - Problems related to lifestyle
Blood loss anemia	D50 - Iron deficiency anemia
Cardiac arrhythmias	I44 - Atrioventricular and left bundle-branch block I45 - Other conduction disorders I47 - Paroxysmal tachycardia I48 - Atrial fibrillation and flutter I49 - Other cardiac arrhythmias R00 - Abnormalities of heart beat T82 - Complications of cardiac or vascular prosthetic devices, implants and grafts Z45 - Encounter for adjustment and management of implanted device Z95 - Presence of cardiac and vascular implants and grafts
Chronic pulmonary disease	I27 - Other pulmonary heart diseases J40 - Bronchitis, not specified as acute or chronic J41 - Simple and mucopurulent chronic bronchitis J42 - Unspecified chronic bronchitis J43 - Emphysema J44 - Other chronic obstructive pulmonary disease J45 - Asthma J47 - Bronchiectasis J60 - Coal worker's pneumoconiosis J61 - Pneumoconiosis due to asbestos and other mineral fibers J62 - Pneumoconiosis due to dust containing silica J63 - Pneumoconiosis due to other inorganic dusts J64 - Unspecified pneumoconiosis J65 - Pneumoconiosis associated with tuberculosis J66 - Airway disease due to specific organic dust J67 - Hypersensitivity pneumonitis due to organic dust J68 - Respiratory conditions due to inhalation of chemicals, gases, fumes and vapors J70 - Respiratory conditions due to other external agents
Coagulopathy	D65 - Disseminated intravascular coagulation D66 - Hereditary factor VIII deficiency D67 - Hereditary factor IX deficiency D68 - Other coagulation defects D69 - Purpura and other hemorrhagic conditions
Congestive heart failure	I09 - Other rheumatic heart diseases I11 - Hypertensive heart disease I13 - Hypertensive heart and chronic kidney disease I25 - Chronic ischemic heart disease I42 - Cardiomyopathy I43 - Cardiomyopathy in diseases classified elsewhere I50 - Heart failure P29 - Cardiovascular disorders originating in the perinatal period
Deficiency anemias	D50 - Iron deficiency anemia D51 - Vitamin B12 deficiency anemia D52 - Folate deficiency anemia D53 - Other nutritional anemias
Depression	F20 - Schizophrenia F31 - Bipolar disorder F32 - Major depressive disorder, single episode F33 - Major depressive disorder, recurrent F34 - Persistent mood [affective] disorders F41 - Other anxiety disorders F43 - Reaction to severe stress, and adjustment disorders

Diabetes¹	E10 - Type 1 diabetes mellitus E11 - Type 2 diabetes mellitus E13 - Other specified diabetes mellitus
Drug abuse	F11 - Opioid related disorders F12 - Cannabis related disorders F13 - Sedative, hypnotic, or anxiolytic related disorders F14 - Cocaine related disorders F15 - Other stimulant related disorders F16 - Hallucinogen related disorders F18 - Inhalant related disorders F19 - Other psychoactive substance related disorders Z71 - Persons encountering health services for other counseling and medical advice, not elsewhere classified Z72 - Problems related to lifestyle
Fluid and electrolyte disorders	E22 - Hyperfunction of pituitary gland E86 - Volume depletion E87 - Other disorders of fluid, electrolyte and acid-base balance
HIV / AIDS	B20 - Human immunodeficiency virus [HIV] disease
Hypertension¹	I10 - Essential (primary) hypertension
Hypothyroidism	E00 - Congenital iodine-deficiency syndrome E01 - Iodine-deficiency related thyroid disorders and allied conditions E02 - Subclinical iodine-deficiency hypothyroidism E03 - Other hypothyroidism E89 - Postprocedural endocrine and metabolic complications and disorders, not elsewhere classified
Liver disease	B18 - Chronic viral hepatitis I85 - Esophageal varices I86 - Varicose veins of other sites K70 - Alcoholic liver disease K71 - Toxic liver disease K72 - Hepatic failure, not elsewhere classified K73 - Chronic hepatitis, not elsewhere classified K74 - Fibrosis and cirrhosis of liver K76 - Other diseases of liver Z94 - Transplanted organ and tissue status
Lymphoma	C81 - Hodgkin lymphoma C82 - Follicular lymphoma C83 - Non-follicular lymphoma C84 - Mature T/NK-cell lymphomas C85 - Other and unspecified types of non-Hodgkin lymphoma C88 - Malignant immunoproliferative diseases and certain other B-cell lymphomas C90 - Multiple myeloma and malignant plasma cell neoplasms C96 - Other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue
Metastatic cancer	C77 - Secondary malignant neoplasm of other and unspecified sites C78 - Malignant neuroendocrine tumors C78 - Secondary malignant neoplasm of other and unspecified sites C79 - Malignant neuroendocrine tumors C79 - Secondary neuroendocrine tumors C80 - Malignant neoplasm without specification of site
Neurological disorders	G10 - Huntington's disease G11 - Hereditary ataxia G12 - Spinal muscular atrophy and related syndromes G13 - Systemic atrophies primarily affecting central nervous system in diseases classified elsewhere G20 - Parkinson's disease G21 - Secondary parkinsonism G25 - Other extrapyramidal and movement disorders G31 - Other degenerative diseases of nervous system, not elsewhere classified G32 - Other degenerative disorders of nervous system in diseases classified elsewhere G35 - Multiple sclerosis G36 - Other acute disseminated demyelination G37 - Other demyelinating diseases of central nervous system G40 - Epilepsy and recurrent seizures G93 - Other disorders of brain R47 - Speech disturbances, not elsewhere classified R56 - Convulsions, not elsewhere classified
Obesity	E66 - Overweight and obesity

Paralysis	G04 - Encephalitis, myelitis and encephalomyelitis G11 - Hereditary ataxia G80 - Cerebral palsy G81 - Hemiplegia and hemiparesis G82 - Paraplegia (paraparesis) and quadriplegia (quadriparesis) G83 - Other paralytic syndromes
Peptic ulcer disease excluding bleeding	K25 - Gastric ulcer K26 - Duodenal ulcer K27 - Peptic ulcer, site unspecified K28 - Gastrojejunal ulcer
Peripheral vascular disorders	I70 - Atherosclerosis I71 - Aortic aneurysm and dissection I73 - Other peripheral vascular diseases I77 - Other disorders of arteries and arterioles I79 - Disorder of arteries, arterioles and capillaries in diseases classified elsewhere K55 - Vascular disorders of intestine Z95 - Presence of cardiac and vascular implants and grafts
Psychoses	F20 - Schizophrenia F22 - Delusional disorders F23 - Brief psychotic disorder F24 - Shared psychotic disorder F25 - Schizoaffective disorders F28 - Other psychotic disorder not due to a substance or known physiological condition F29 - Unspecified psychosis not due to a substance or known physiological condition F30 - Manic episode F31 - Bipolar disorder
Pulmonary circulation disorders	I26 - Pulmonary embolism I27 - Other pulmonary heart diseases I28 - Other diseases of pulmonary vessels
Renal failure	I12 - Hypertensive chronic kidney disease I13 - Hypertensive heart and chronic kidney disease N18 - Chronic kidney disease (CKD) N19 - Unspecified kidney failure N25 - Disorders resulting from impaired renal tubular function Z49 - Encounter for care involving renal dialysis Z94 - Transplanted organ and tissue status Z99 - Dependence on enabling machines and devices, not elsewhere classified
Rheumatoid arthritis / collagen vascular diseases	L94 - Other localized connective tissue disorders M05 - Rheumatoid arthritis with rheumatoid factor M06 - Other rheumatoid arthritis M08 - Juvenile arthritis M12 - Chronic gout M12 - Osteoarthritis of first carpometacarpal joint M12 - Other and unspecified osteoarthritis M30 - Polyarteritis nodosa and related conditions M31 - Other necrotizing vasculopathies M32 - Systemic lupus erythematosus (SLE) M33 - Dermatopolymyositis M34 - Systemic sclerosis [scleroderma] M35 - Other systemic involvement of connective tissue M45 - Ankylosing spondylitis M46 - Other inflammatory spondylopathies
Solid tumor without metastasis	C00 - Malignant neoplasm of lip C01 - Malignant neoplasm of base of tongue C02 - Malignant neoplasm of other and unspecified parts of tongue C03 - Malignant neoplasm of gum C04 - Malignant neoplasm of floor of mouth C05 - Malignant neoplasm of palate C06 - Malignant neoplasm of other and unspecified parts of mouth C07 - Malignant neoplasm of parotid gland C08 - Malignant neoplasm of other and unspecified major salivary glands C09 - Malignant neoplasm of tonsil C10 - Malignant neoplasm of oropharynx C11 - Malignant neoplasm of nasopharynx C12 - Malignant neoplasm of pyriform sinus C13 - Malignant neoplasm of hypopharynx C14 - Malignant neoplasm of sites in the lip, oral cavity and pharynx C15 - Malignant neoplasm of esophagus C16 - Malignant neoplasm of stomach

	<p>C17 - Malignant neoplasm of small intestine C18 - Malignant neoplasm of colon C19 - Malignant neoplasm of rectosigmoid junction C20 - Malignant neoplasm of rectum C21 - Malignant neoplasm of anus and anal canal C22 - Malignant neoplasm of liver and intrahepatic bile ducts C23 - Malignant neoplasm of gallbladder C24 - Malignant neoplasm of other and unspecified parts of biliary tract C25 - Malignant neoplasm of pancreas C26 - Malignant neoplasm of other and ill-defined digestive organs C30 - Malignant neoplasm of nasal cavity and middle ear C31 - Malignant neoplasm of accessory sinuses C32 - Malignant neoplasm of larynx C33 - Malignant neoplasm of trachea C34 - Malignant neoplasm of bronchus and lung C37 - Malignant neoplasm of thymus C38 - Malignant neoplasm of heart, mediastinum and pleura C39 - Malignant neoplasm of sites in the resp sys and intrathoracic organs C40 - Malignant neoplasm of bone and articular cartilage of limbs C41 - Malignant neoplasm of bone and articular cartilage of and unspecified sites C43 - Malignant melanoma of skin C45 - Malignant neoplasm of peripheral nerves and autonomic nervous sys C45 - Malignant neoplasm of retroperitoneum and peritoneum C46 - Malignant neoplasm of other connective and soft tissue C47 - Malignant neoplasm of other connective and soft tissue C47 - Merkel cell carcinoma C48 - Merkel cell carcinoma C49 - Merkel cell carcinoma C50 - Malignant neoplasm of breast C51 - Malignant neoplasm of vulva C52 - Malignant neoplasm of vagina C53 - Malignant neoplasm of cervix uteri C54 - Malignant neoplasm of corpus uteri C55 - Malignant neoplasm of uterus, part unspecified C56 - Malignant neoplasm of ovary C57 - Malignant neoplasm of other and unspecified female genital organs C58 - Malignant neoplasm of placenta C60 - Malignant neoplasm of penis C61 - Malignant neoplasm of prostate C62 - Malignant neoplasm of testis C63 - Malignant neoplasm of other and unspecified male genital organs C64 - Malignant neoplasm of kidney, except renal pelvis C65 - Malignant neoplasm of renal pelvis C66 - Malignant neoplasm of ureter C67 - Malignant neoplasm of bladder C68 - Malignant neoplasm of other and unspecified urinary organs C69 - Malignant neoplasm of eye and adnexa C70 - Malignant neoplasm of meninges C71 - Malignant neoplasm of brain C72 - Malignant neoplasm of spinal cord, cranial nerves and other parts of the central nervous system C73 - Malignant neoplasm of thyroid gland C74 - Malignant neoplasm of adrenal gland C75 - Malignant neoplasm of endo glands and related structures C76 - Secondary malignant neoplasm of other and unspecified sites C76 - Secondary malignant neoplasm of resp and digestive organs</p>
<p>Valvular disease</p>	<p>A52 - Late syphilis I05 - Rheumatic mitral valve diseases I06 - Rheumatic aortic valve diseases I07 - Rheumatic tricuspid valve diseases I08 - Multiple valve diseases I09 - Other rheumatic heart diseases I34 - Nonrheumatic mitral valve disorders I35 - Nonrheumatic aortic valve disorders I36 - Nonrheumatic tricuspid valve disorders I37 - Nonrheumatic pulmonary valve disorders I38 - Endocarditis, valve unspecified I39 - Endocarditis and heart valve disorders in diseases classified elsewhere Q23 - Congenital malformations of aortic and mitral valves Z95 - Presence of cardiac and vascular implants and grafts</p>

Weight loss	E40 - Kwashiorkor E41 - Nutritional marasmus E42 - Marasmic kwashiorkor E43 - Unspecified severe protein-calorie malnutrition E44 - Protein-calorie malnutrition of moderate and mild degree E45 - Retarded development following protein-calorie malnutrition E46 - Unspecified protein-calorie malnutrition R63 - Symptoms and signs concerning food and fluid intake R64 - Cachexia
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Notes:

1. Complicated and uncomplicated diabetes were combined as one condition. Likewise, complicated and uncomplicated hypertension were combined as one condition.
 2. ICD-10 descriptions were curated using the *icd* R package.[1]
1. Wasey JO, Frank SM, Rehman MA. *icd*: Efficient Computation of Comorbidities from ICD Codes Using Sparse Matrix Multiplication in R. *Journal of Statistical Software*. 2018. Available: <https://jackwasey.github.io/icd/articles/efficiency-prebuilt.pdf>