

ONLINE SUPPLEMENT – APPENDIX B: ALGORITHMS AND CODES FOR IDENTIFYING CHRONIC CONDITIONS & IMMUNOCOMPROMISING CONDITIONS

Appendix B. Diagnosis, procedure, and drug codes for algorithms identifying baseline chronic conditions

Condition	ICD-9-CM		HCPCS		Rx	Algorithms	
	Codes	Description	Codes	Description			
Chronic Heart Disease	393-398	Chronic rheumatic heart disease					
	402	Hypertensive heart disease, with and without heart failure					
	404	Hypertensive heart/kidney disease, with and without heart failure					
	410.xx	Acute myocardial infarction	33510-516	Coronary artery bypass, vein only			
	411.xx	Other acute and subacute forms of ischemic heart disease	33510-516	Coronary artery bypass, vein only			
	412.xx	Old myocardial infarction	33517-523	Coronary artery bypass, using venous graft(s) and arterial graft(s)			
	413.xx	Angina pectoris	33530	Reoperation, coronary artery bypass procedure or valve procedure			
	414.xx	Coronary atherosclerosis	33533-36	Coronary artery bypass, using arterial graft(s); single or multiple arterial graft		Within two years prior to subject quarter:	
	416	Chronic pulmonary heart disease	92980-82	Insert intracoronary stent		>=2 outpatient Dx (>=7 days apart) or	
	424.x	Other diseases of endocardium	92982, 92984	Coronary artery dilation		>=1 inpatient Dx or	
	425.x	Cardiomyopathy	92920-92944	Emergency cardiac procedure		>=1 Procedure	
	428.x	Heart failure	92995-96	Coronary atherectomy or add-on			
	429.7x	Certain sequelae of myocardial infarction					
	36.0	Removal of coronary artery obstruction and insertion of stent(s)					
	36.1	Bypass aasastomosis for heart revascularization					
	36.2	Heart revascularization by arterial implant					
	36.3	Other heart revascularization					
	Congenital heart disease	745.xx	Bulbus cordis anomalies and anomalies of cardiac septal closure				
		746.xx	Other congenital anomalies of heart; excludes endocardial fibroelastosis				
		747.1	Coarctation of aorta				
Chronic lung disease	277.0	Cystic fibrosis					
	416.8	Other chronic pulmonary heart diseases					
	416.9	Chronic pulmonary heart disease, unspecified					
	490	Bronchitis, not specified as acute or chronic					
	491	Chronic bronchitis					
	492	Emphysema				Within two years prior to subject quarter:	
	494	Bronchiectasis				>=2 outpatient Dx (>=7 days apart) or	
	496	Chronic airway obstruction, not elsewhere classified				>=1 inpatient Dx	
	500-505	Pneumoconiosis					
	506.4	Chronic respiratory conditions due to fumes and vapors					
	515	Postinflammatory pulmonary fibrosis					
	516	Other alveolar and parietoalveolar pneumonopathy					
	518.83	Chronic respiratory failure					
	518.84	Acute and chronic respiratory failure					
	770.7	Chronic respiratory disease arising in perinatal period (incl. bronchio pulmonary dysplasia)					
	Asthma						Within two years prior to subject quarter:
493.xx		Asthma				>=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx	
Diabetes	249.xx	Secondary diabetes mellitus			Antidiabetics (insulin, alpha-glucosidase inhibitors, biguanides, sulfonyleureas, nonsulfonyleurea, secretagogues, thiazolidinediones)	Within two years prior to subject quarter:	
	250.xx	Diabetes mellitus				>=2 outpatient Dx (>=7 days apart) or	
	357.2	Polyneuropathy in diabetes				>=1 inpatient Dx or Rx claim	
	362.0x	Diabetic retinopathy					
	366.41	Diabetic cataract					
	648.0	Other current conditions in mother...Diabetes mellitus (excludes gestational)					
	E932.3	Adverse effects...Insulins and antidiabetic agents					

Appendix B. Diagnosis, procedure, and drug codes for algorithms identifying baseline chronic conditions (Cont.)

Condition	ICD-9-CM		HCPCS		Rx	Algorithms
	Codes	Description	Codes	Description		
Alcoholism	291.xx	Alcohol induced mental disorders; withdrawal delirium; alcohol induced persisting amnestic disorder; alcohol induced persisting dementia; alcohol induced psychotic disorder with hallucinations; idiosyncratic alcohol intoxication; alcohol induced psychotic disorder with delusions; Other specified alcohol induced mental disorders: withdrawal; sleep disorders; other.			Alcohol deterrents (acamprosate, antabuse, disulfiram, naltrexone)	Within two years prior to subject quarter: ≥2 outpatient Dx (≥7 days apart) or ≥1 inpatient Dx or Rx claim
	303	Alcohol dependence syndrome				
	303.9	Other and unspecified alcohol dependence				
	V11.3	Alcoholism				
Chronic liver disease	571.xx	Chronic liver disease and cirrhosis; alcoholic fatty liver; acute alcoholic hepatitis; alcoholic cirrhosis of liver; alcoholic liver damage, unspecified; chronic hepatitis; cirrhosis of liver without mention of alcohol; biliary cirrhosis; other chronic nonalcoholic liver disease; unspecified chronic liver disease without mention of alcohol	37140-37183	Venous anastomosis, opn prctvl; venous anastmsis,opn; renoprft; vnous anastomosis,opn cvl-mes; vnous anastomosi,opn splen,prx; vnous anastmosi,opn splen,dstl; insert hepatic shunt (tips); remove hepatic shunt (tips)		
	572.xx	Liver abscess and sequelae of chronic liver disease; abscess of liver; portal pyemia; hepatic coma; portal hypertension; hepatorenal syndrome; other sequelae of chronic liver disease	43204-205	Esophagus endoscopy & inject; endoscopy/ligation		Within two years prior to subject quarter: ≥2 outpatient Dx (≥7 days apart) or ≥1 inpatient Dx or ≥1 procedure
	573.0	Chronic passive congestion of liver				
	456.0	Esophageal varices with bleeding	43243-244	Upper GI endoscopy & inject; endoscopy/ligation		
	456.1	Esophageal varices without mention of bleeding	43400	Ligate esophagus veins		
	456.2	Esophageal varices in diseases classified elsewhere				
	39.1	Operations on the cardiovascular system, other operations on vessels, intra-abdominal venous shunt				
	42.91	Operations on esophagus, ligation of esophageal varices				
Smokers	305.1	Tobacco use disorder	99406-99407	Smoking cessation counseling		Within two years prior to subject quarter: ≥2 outpatient Dx (≥7 days apart) or ≥1 inpatient Dx or ≥1 procedure or Rx claim
	V15.82	History of tobacco use			Smoking deterrents (varenicline, nicotine replacement products)	
	649.0	Tobacco use disorder complicating pregnancy, childbirth, or the puerperium				
Down's Syndrome	758.0					Within two years prior to subject quarter: ≥2 outpatient Dx (≥7 days apart) or ≥1 inpatient Dx

Appendix B. Diagnosis, procedure, and drug codes for algorithms identifying baseline immunocompromising conditions

Condition	ICD-9-CM		HCPCS		Rx	Algorithms
	Codes	Description	Codes	Description		
Functional or Anatomic Asplenia						
Asplenia	41.5	Operations on bone marrow and spleen, total splenectomy	38100 38102 38120	Removal of spleen, total Removal of spleen, total Laparoscopy, splenectomy		
Sickle cell disease and other hemoglobinopathies	282.4 282.5 282.6 282.7 284.x 289.4 289.5x 759.0 759.3	Thalassemias Sickle-cell trait Sickle-cell disease Other hemoglobinopathies Aplastic anemia and other bone marrow failure syndromes Hypersplenism Other diseases of spleen Congenital syndromes (incl. ivemark) Situs Inversus				Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx or >=1 procedure
HIV infection					Anti-HIV (protease inhibitors, nucleoside/nucleotide reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, entry inhibitors, integrase inhibitors)	Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx or >=1 Rx
	042, V08	Human immunodeficiency virus (HIV)				
Chronic renal failure	585.3 - 585.9 586 V42.0 V45.1 V56.x 54.98 581.xx	Chronic kidney disease (Stage III, Stage IV, Stage V, ESRD, Unspecified) Renal failure, unspecified Organ or tissue replaced by transplant, kidney Renal dialysis status Encounter for dialysis and dialysis catheter care Peritoneal dialysis Nephrotic syndrome	36800-821 90955-99 93990 99512 (2006-2008) 90918-90921; (2009-2010) 90951-90962	Vascular access for hemodialysis ESRD, dialysis services Duplex scan of hemodialysis access Home visit for hemodialysis ESRD-related services Home visit for peritoneal dialysis		Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx or >=1 procedure
Nephrotic syndrome	581.xx	Nephrotic syndrome				
Congenital immunodeficiency	279.x	Disorders involving the immune mechanism, deficiency of humoral immunity; deficiency of cell-mediated immunity; combined immunity deficiency; unspecified immunity deficiency; autoimmune disease, not elsewhere classified				
Diseases of white blood cells	288.0x 288.1x	Neutropenia Functional disorders of polymorphonuclear neutrophils				Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx
Cochlear implant	20.96 20.97 20.98	Other operation on inner and middle ear, implantation or replacement of cochlear prosthetic device, not otherwise specified Other operation on inner and middle ear, implantation or replacement of cochlear prosthetic device, single channel Other operation on inner and middle ear, implantation or replacement of cochlear prosthetic device, multiple channel	69930	Implant cochlear device		Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx or >=1 procedure

Appendix B. Diagnosis, procedure, and drug codes for algorithms identifying baseline immunocompromising conditions (Cont.)

Condition	ICD-9-CM		HCPCS		Rx	Algorithms
	Codes	Description	Codes	Description		
Diseases associated w/ immuno Rx or radiation Tx						
Malignant neoplasms	140-208 (except 173)	Solid/blood cancers	Level II codes	Chemotherapy agents	Chemotherapy drugs	Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx or >=1 procedure or >=1 Rx Patients with cancer will be stratified into two buckets: those with vs without evidence of chemotherapy/radiation therapy during the year prior the subject year
	V58.0	Encounter for other and unspecified procedures and aftercare, radiotherapy	Level I Codes	Radiation therapy	Immunosuppressants	
	V58.1	Encounter for antineoplastic chemotherapy and immunotherapy	Level II codes	Immunosuppressants		
	V67.1	Follow-up examination, following radiotherapy				
	V67.2	Follow-up examination, following chemotherapy				
	92.2x	Infusion of liquid brachytherapy radioisotope; superficial radiation; orthovoltage radiation; radioisotopic teleradiotherapy; teleradiotherapy using photons; teleradiotherapy using electrons; teleradiotherapy of other particulate radiation; implantation or insertion of radioactive elements; injection or instillation of radioisotopes; other radiotherapeutic procedure				
	99.25	Injection or infusion of cancer chemotherapeutic substance				
Solid organ transplantation						
V42.81	Organ or tissue replaced by transplant, bone marrow	38240	Bone marrow/stem transplant			Within two years prior to subject quarter: >=2 outpatient Dx (>=7 days apart) or >=1 inpatient Dx or >=1 procedure
V42.82	Organ or tissue replaced by transplant, peripheral stem cells	38241	Bone marrow/stem transplant			
V42.0	Organ or tissue replaced by transplant, kidney	33945	Transplantation of heart			
V42.1	Organ or tissue replaced by transplant, heart	33935	Transplantation, heart/lung			
V42.84	Organ or tissue replaced by transplant, intestines	44135	Intestinal allotranspl;cadaver			
V42.7	Organ or tissue replaced by transplant, liver	44136	Intestinal allotranspl; living			
V42.6	Organ or tissue replaced by transplant, lung	47135	Transplantation of liver			
V42.83	Organ or tissue replaced by transplant, pancreas	50360	Transplantation of kidney			
V42.89	Organ or tissue replaced by transplant, other	5,036,050,365	Transplantation of kidney			
V42.9	Organ or tissue replaced by transplant, unspecified organ or tissue	38999	Blood/lymph system procedure			
41.0x	Operations on bone marrow and spleen; bone marrow or hematopoietic stem cell transplant; bone marrow transplant, not otherwise specified; autologous bone marrow transplant without purging; allogeneic bone marrow transplant with purging; allograft of bone marrow with in vitro removal (purging) of T-cells; allogeneic bone marrow transplant without purging; allograft of bone marrow NOS; autologous hematopoietic stem cell transplant without purging; allogeneic hematopoietic stem cell transplant without purging; cord blood stem cell transplant; autologous hematopoietic stem cell transplant with purging; allogeneic hematopoietic stem cell transplant; autologous bone marrow transplant with purging.					
37.5	Heart replacement procedures					
33.6	Combined heart-lung transplantation					
46.97	Transplant of intestine					
50.59	Other transplant of liver					
33.5	Lung transplant					
33.51	Unilateral lung transplantation					
33.52	Bilateral lung transplantation					
55.69	Other kidney transplantation					
41.94	Transplantation of spleen					
52.8	Transplant of pancreas					