

SUPPLEMENTARY TABLE 1: INTERNATIONAL CLASSIFICATION OF DISEASES, NINTH REVISION, CLINICAL MODIFICATION (ICD-9-CM) CODES FOR COMORBIDITIES OF INTEREST

Comorbidity	ICD-9-CM diagnosis codes
Anxiety Disorders	300.01, 300.21, 300.22, 300.23, 300.30, 309.81, 308.30, 300.02, 293.89, 300.09, 300.00
Cerebrovascular Disease	430.xx-438.xx
Chronic Kidney Disease	585.1,585.2, 585.3, 585.4, 585.5, 585.6, 585.9
Congestive Heart Failure	398.91, 402.11, 402.91, 404.11, 404.13, 404.91, 404.93, 428.0x-428.9x
Coronary Artery Disease	411.xx, 412.xx, 413.xx, 414.xx, 429.2
Depressive Disorders	296.2, 296.3, 300.4, 311.0
Obesity	259.9x, 278.0x, 278.00, V77.8, V85.30-V85.34, V85.53, V85.54, 278.01, V85.35-V85.39 V85.4
Osteoarthritis	715.xx
Osteoporosis	733, 733.01, 733.02, 733.03, 733.09, V17.81, V82.81
Sleep Apnea	327.20, 327.21, 780.51, 780.53, 780.57
Type 2 Diabetes Mellitus	250.x0, 250.x2
Arteriosclerosis	440.xx
Lower Respiratory Tract Infections (LRTIs)	466.xx, 480-487
Upper Respiratory Tract Infections (URTIs)	460-465

SUPPLEMENTARY TABLE 2: DEYO CHARLSON COMORBIDITY CATEGORIES AND ASSOCIATED DIAGNOSIS CODES AND WEIGHTS

Comorbidity	ICD-9-CM Codes	Weight
Myocardial Infarction	410.xx, 412.xx	1
Congestive Heart Failure	428.xx	1
Peripheral Vascular Disease	441.xx, 443.9, 785.4, V43.4, 38.48*	1
Cerebrovascular Disease	430.xx-437.xx, 438.xx	1
Dementia	290.xx	1
Chronic Pulmonary Disease	490.xx-496.xx, 500.xx-505.xx, 506.4	1
Connective Tissue Disease	710.xx, 714.xx, 725.xx	1
Peptic Ulcer Disease	531.4x-531.7x, 532.4x-532.7x, 533.4x-533.7x, 534.4x-534.7x, 531.0x-531.3x, 532.0x-532.3x, 533.0x-533.3x, 534.0x-534.3x, 531.9x, 532.9x, 533.9x, 534.9x	1
Mild Liver Disease	571.2, 571.4, 571.5, 571.6	1
Diabetes without Complications	250.0x-250.3x, 250.7x	1
Diabetes with Complications	250.4x-250.6x	2
Paraplegia and Hemiplegia	342.x, 344.1	2
Renal Disease	582.x, 583.0-583.7, 585.xx, 586.xx, 588.xx	2
Cancer (Including Leukemia and Lymphoma)	140.xx-172.xx, 174.xx-195.xx, 200.xx-208.xx	2
Moderate or Severe Liver Disease	572.2-572.8	3
Metastatic Carcinoma	196.x-199.x	6
Acquired Immunodeficiency Syndrome (AIDS)	042.xx-044.x	6

Reference: Deyo RA, Cherkin DC, Ciol MA. Adapting a clinical comorbidity index for use with ICD-9-CM administrative databases. J Clin Epidemiol, 1992. 45(6): p. 613-9.

SUPPLEMENTARY TABLE 3: LIST OF COPD-RELATED MEDICATIONS

Long-acting bronchodilators	
Long-acting muscarinic antagonists (LAMA)	Acclidinium, tiotropium, umeclidinium
Long-acting β 2 agonists (LABA)	Arformoterol, formoterol, indacaterol, olodaterol, salmeterol
LABA + LAMA	Umeclidinium + vilanterol
LABA + inhaled corticosteroid (ICS)	Budesonide + formoterol, fluticasone + salmeterol, fluticasone + vilanterol, mometasone furoate + formoterol fumarate
Short-acting bronchodilators	
Short-acting β 2 agonists (SABA)	Albuterol, albuterol sulfate, levalbuterol, levalbuterol tartrate, metaproterenol, terbutaline, pirbuterol,
Short-acting muscarinic antagonists (SAMA)	Ipratropium
SABA + SAMA	Albuterol + ipratropium
Inhaled corticosteroids	Budesonide, ciclesonide, flunisolide, flunisolide/menthol, fluticasone, mometasone, mometasone furoate/ammonium lactate
Systemic corticosteroids	Methylprednisolone, prednisone, triamcinolone
Phosphodiesterase-4 (PDE-4) inhibitors	Roflumilast
Methylxanthines	Aminophylline, dyphylline, dyphylline-guaifenesin, guaifenesin, guaifenesin-theophylline, potassium iodide-theophylline, theophylline
Respiratory antibiotics	Penicillin V potassium, Amoxicillin, Amoxicillin/clavulanate potassium, Penicillin G benzathine, Penicillin G benzathine/penicillin G, procaine, Cefadroxil, Erythromycin, Erythromycin ethylsuccinate, Erythromycin stearate, Erythromycin estolate, Cefaclor, Morphine sulfate, Cefuroxime axetil, Azithromycin, Azithromycin dihydrate, Clarithromycin, Doxycycline, Doxycycline hyclate, Doxycycline calcium

**SUPPLEMENTARY TABLE 4: GENERIC PRODUCT IDENTIFIER CODES FOR
INHALED CORTICOSTEROID THERAPIES**

Drug/Combination Name	Generic Product Identifier
Beclomethasone Budesonide Ciclesonide Flunisolide Fluticasone Mometasone Triamcinolone	4440(x)
Long Acting Beta-Agonist/Inhaled Corticosteroid Combinations	
Fluticasone-vilanterol	4420990270
Budesonide-formoterol	4420990290
Fluticasone-salmeterol	4420990241
Mometasone-formoterol	4420990275

SUPPLEMENTARY TABLE 5: GENERIC PRODUCT IDENTIFIER CODES FOR ANTIBIOTICS FOR RESPIRATORY INFECTIONS

Drug/Combination Name	Generic Product Identifier
Penicillin V potassium	0110004000, 0110004010
Amoxicillin	0120001010
Amoxicillin/clavulanate potassium	0199000220
Penicillin G benzathine	0110002000
Penicillin G benzathine/penicillin G procaine	0199000210
Cefadroxil	0210001000
Erythromycin	0310004040, 0310005050, 0310000500, 0310000600
Erythromycin ethylsuccinate	0310003030
Erythromycin stearate	0310001010
Erythromycin estolate	0310002020
Cefaclor	0220004000, 0220004010
Morphine sulfate	6510005510
Cefuroxime axetil	0220006505
Azithromycin	0340001000, 0340001010
Azithromycin dihydrate	9642896000
Clarithromycin	0350001000
Doxycycline	0400002000
Doxycycline hyclate	0400002010, 0400002015
Doxycycline calcium	0400002020

**SUPPLEMENTARY TABLE 6: NATIONAL DRUG CODES FOR COPD
RESCUE/MAINTENANCE DRUG LIST**

Drug Class	Generic Name	NDCs
Long-acting bronchodilators		
LAMAs	Acclidinium	00456080031, 00456080060
	Tiotropium	00597007506, 00597007537, 00597007541, 00597007547, 00597007575, 00597010031,
	Umeclidinium	00173087306, 00173087310, 00173087361
LABAs	Arformoterol	63402091101, 63402091130, 63402091164
	Formoterol	00083016702, 00083016711, 00083016774, 00085140101, 00085140201, 00085140202, 37803061903, 37803061904, 37803061905, 38779229503, 38779229506, 49502060530, 49502060561, 51552114801, 51927364300, 54569525400, 54868497200, 54868497201, 62991251601, 62991251603, 68115065160
	Indacaterol	00078061915, 00078061961
	Olodaterol	00597019228, 00597019231, 00597019261
	Salmeterol	00173046400, 00173046500, 00173046700, 00173052000, 00173052100, 12280017360,
LABA+LAMA	Umeclidinium; vilanterol	00173086906, 00173086910
LABA+ICS	Budesonide + formoterol	00186037020, 00186037028, 00186037220, 00186037228, 54569646600, 54868593600,
	Fluticasone + salmeterol	00173069500, 00173069502, 00173069504, 00173069600, 00173069602, 00173069604, 00173069700, 00173069702, 00173069704, 00173071500, 00173071520, 00173071522, 00173071600, 00173071620, 00173071622, 00173071700, 00173071720, 00173071722, 21695019601, 21695019701, 21695036160, 23490754201, 49999081960, 49999098460, 49999098560, 54569524100, 54569524200, 54569524300, 54868451600, 54868451700, 54868451800, 55045338801, 55045368601, 58016460401, 58016481201, 58016481301, 68115065701, 68115076001, 68115092460, 68258303101
	Fluticasone + vilanterol	00173085910, 00173085914, 00173085961
	Mometasone furoate + formoterol fumarate	00085461001, 00085461005, 00085720601, 00085720607

COPD = chronic obstructive pulmonary disease; ICS = inhaled corticosteroid; LABA = long-acting β 2 agonists; LAMA = long-acting muscarinic antagonists; SABA = short-acting β 2 agonists

Drug Class	Generic Name	NDCs
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Short-acting bronchodilators

SABAs	Albuterol	00047299711, 00085061402, 00085061403, 00085061510, 00172439018, 00173032188, 00173032198, 00173046300, 00364263217, 00364263298, 00403177218, 00403225118, 00472126463, 00472126478, 00536041612, 00536121612, 00536121613, 00603100475, 00603100499, 00677154970, 00781750287, 00781750288, 00839760807, 00839760880, 00904507834, 00904507934, 16590000417, 17270072101, 21695019801, 23490501901, 38779018404, 38779018405, 38779018410, 38779018425, 38779018450, 49452022502, 49452022503, 49502030317, 49502030327, 49502033317, 49999017117, 50111080131, 50111080132, 51927285900, 52555059417, 52959009403, 52959029300, 52959112100, 52959129301, 52959142103, 53002090265, 54569005200, 54569100300, 54569100800, 54569101100, 54868073001, 54868104101, 54868190300, 54868370900, 54868373900, 55045239005, 55175256801, 55175257201, 55175257501, 55887081218, 55953005153, 57866005101, 58016605901, 58016609901, 58016620501, 58980010817, 59723012201, 59772617501, 59772617502, 59930156001, 60346033176, 60346038476, 60346039476, 60346040876, 62037079444, 66267099517, 68030005101, 68115099517
	Albuterol sulfate	00005306231, 00005306243, 00005306331, 00005306343, 00047095624, 00047100623, 00047100632, 00054806311, 00054806313, 00054806321, 00056019870, 00056019885, 00056019970, 00056019985, 00085020802, 00085025202, 00085025203, 00085031502, 00085043102, 00085043103, 00085057302, 00085057303, 00085113201, 00085133601, 00085180601, 00093066501, 00093066505, 00093066601, 00093066605, 00093222605, 00172640549, 00173034143, 00173034144, 00173034243, 00173034244, 00173038558, 00173038901, 00173038902, 00173038903, 00173041900, 00173068220, 00173068221, 00173068224, 00173068254, 00173068281, 00182101201, 00182601465, 00182601540, 00182801024, 00182801026, 00186149104, 00186149117, 00247026415, 00247026420, 00247026430, 00247026520, 00247026530, 00247060408, 00247060414, 00247060420, 00247087120, 00332222609, 00332222613, 00332222809, 00332222813, 00349871325, 00349871401, 00349871425, 00349899401, 00349899405, 00349899505, 00364243801, 00364243901, 00364252216, 00364253055, 00378025505, 00378057201, 00378057205, 00378340172, 00378412201, 00378699052, 00378699058, 00378699091, 00378699093, 00378699152, 00378827052, 00378827055, 00378827091, 00378827093, 00403177384, 00403177601, 00403177630, 00403177820, 00403225384, 00403225388, 00403280120, 00403350718, 00403467218, 00405213052, 00405213125, 00405213516, 00405403001, 00405403002, 00405403101, 00405403102, 00440704530, 00440704630, 00451039800, 00451039850, 00451039860, 00451039950, 00451039960, 00472082504, 00472082508, 00472082516, 00472083130, 00472083160, 00472083220, 00487030101, 00487030102, 00487950102, 00487950103, 00487950125, 00487950160, 00487990102, 00487990401, 00487990402, 00487990425, 00536000773, 00536041585, 00536267573, 00536267704, 00536300801, 00536300805, 00536300901, 00574051201, 00574051225, 00591346753, 00591346853, 00591379730, 00591379783, 00603100540, 00603100643, 00603100758, 00603100858, 00603209328, 00603209421, 00603209428, 00615351713, 00615351729, 00615351753, 00615351763, 00615351813, 00615351829, 00615351843, 00615351863, 00677135901, 00677135905, 00677136001, 00677136005, 00677152122, 00677152272, 00677152273, 00686065620, 00686065720, 00686065820.

COPD = chronic obstructive pulmonary disease; SABA = short-acting β 2 agonists.

Drug Class	Generic Name	NDCs
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Short-acting bronchodilators (cont'd)

SABAs (cont'd)	Albuterol sulfate (cont'd)	<p>00781167101, 00781167201, 00781606716, 00781715529, 00781715564, 00781753580, 00781915093, 00839761106, 00839761112, 00839761206, 00839773097, 00839774669, 00839781610, 00839785969, 00839786018, 00839786197, 00839786706, 00904287640, 00904287660, 00904287661, 00904287760, 00904287761, 00904765855, 00904768116, 00904773117, 11845040003, 11845040101, 11845040103, 12280024125, 16252009722, 16252009766, 21695024520, 21695033225, 21695033230, 21695035016, 21695042318, 21695085185, 23490502001, 23490502002, 23490502102, 23490502202, 23490502300, 23490502301, 23490502302, 23490502501, 24208034720, 35356016601, 38245013210, 38245013250, 38245013410, 38245066917, 38779018501, 38779018504, 38779018505, 38779018508, 38779018510, 38779018525, 38779018550, 42254000467, 43567056307, 43567056407, 43567056411, 49452022601, 49452022602, 49452022603, 49502019620, 49502069203, 49502069303, 49502069703, 49502069724, 49502069730, 49502069733, 49502069760, 49502069761, 49502079516, 49999033816, 49999034425, 49999090120, 49999090767, 49999090885, 50111049102, 50111049201, 50111049202, 50383074016, 50383074120, 50962040205, 50962040350, 50962040451, 50962040803, 50962040805, 51079065701, 51079065720, 51079065801, 51079065820, 51079076010, 51079083006, 51079083106, 51285072057, 51432034020, 51432038103, 51432038203, 51432038205, 51432074511, 51552004401, 51552004402, 51552004405, 51552004406, 51552004407, 51552004410, 51552004411, 51927157300, 52544041916, 52555049101, 52555049105, 52555049201, 52555058101, 52555058105, 52555058201, 52555058205, 52959015303, 52959015309, 52959042520, 52959042530, 52959056901, 52959074120, 52959129400, 52959141103, 52959141106, 52959141109, 52959146701, 53002039120, 53002051688, 53002051692, 53002061800, 53002061820, 53002061830, 53002087199, 53002103602, 53002103603, 53014007525, 53014007560, 53489017605, 53489017701, 53489017705, 54124031504, 54124031506, 54124034150, 54124049560, 54569005001, 54569005002, 54569005101, 54569034501, 54569038700, 54569038701, 54569038702, 54569038703, 54569042301, 54569042302, 54569169101, 54569198900, 54569274300, 54569274400, 54569287400, 54569287401, 54569287402, 54569287700, 54569340901, 54569340902, 54569340903, 54569355500, 54569370000, 54569370002, 54569374100, 54569389900, 54569390000, 54569400100, 54569400102, 54569400103, 54569417200, 54569417201, 54569417800, 54569462100, 54569489900, 54569577700, 54569616600, 54569616700, 54569700500, 54569858900, 54868030701, 54868030801, 54868107302, 54868107304, 54868107305, 54868107306, 54868107403, 54868107405, 54868107407, 54868247200, 54868247201, 54868288700, 54868340700, 54868554200, 54868554201, 54868564600, 54868564601, 54868564602, 54868605000, 54868605001, 54868605100, 55045173205, 55045187809, 55045349401, 55175121300, 55175121301, 55175170200, 55175170205, 55175221003, 55175221101, 55175221108, 55175255702, 55175255704, 55289000930, 55289000960, 55289003904, 55289004530, 55289029304, 55289036320, 55289036324, 55289036330, 55289049830, 55289063415, 55289070004, 55289081030, 55370011107, 55370011108, 55370011207, 55370031548, 55953020925, 55953021220, 55953048040, 55953048070, 55953049970, 57480042201, 57480042206, 57480042301, 57480042306, 58016032820, 58016032824, 58016032848, 58016047300, 58016047312, 58016047320, 58016047324, 58016047330, 58016047390, 58016048224, 58016048724, 58016048748, 58016060300, 58016060312, 58016060315, 58016060320,</p>
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COPD = chronic obstructive pulmonary disease; SABA = short-acting β 2 agonists.

Drug Class	Generic Name	NDCs
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Short-acting bronchodilators (cont'd)

SABAs (cont'd)	Albuterol sulfate (cont'd)	58016060324, 58016060330, 58016501801, 58016610901, 58016640401, 59310057920, 59310057922, 59930150006, 59930150008, 59930151005, 59930151701, 59930151702, 59930152001, 59930152002, 59930153001, 59930164702, 60346005410, 60346005430, 60346028528, 60346028530, 60346067204, 60432009406, 61392056730, 61392056731, 61392056732, 61392056745, 61392056751, 61392056754, 61392056756, 61392056760, 61392056791, 61392057030, 61392057031, 61392057032, 61392057039, 61392057051, 61392057054, 61392057056, 61392057060, 61392057090, 61392057091, 62584060501, 62584060601, 62991100601, 62991100602, 62991100603, 62991100604, 63370001050, 63629182801, 63629263801, 63629263802, 63629273601, 63874070924, 65271000205, 65271000206, 65473075401, 65473075801, 66267001030, 66336005430, 66336005490, 66336028520, 66336028530, 66794000130, 66794000160, 66794000330, 66993023057, 68071152505, 68115000860, 68115000915, 68115000930, 68115071120, 68115076917, 68258303706, 68258897406, 68774040001, 68774040101, 68774060001, 76204020001, 76204020025, 76204020030, 76204020060
	Levalbuterol	00093414504, 00093414564, 00093414604, 00093414664, 00093414804, 00378699393, 00378968044, 00378968144, 00378968244, 00591291823, 00591291923, 00591291939, 00591292023, 00591292039, 21695015324, 54569474800, 54569544500, 54569638100, 54868440900, 54868545900, 54868602100, 63402051300, 63402051324, 63402051396, 63402051500, 63402051530, 66993002135, 66993002227, 66993002235, 66993002327, 66993002335, 76204000324, 12280040915, 49999092215, 54569585300, 54868568900, 63402051001
	Levalbuterol tartrate	12280040915, 49999092215, 54569585300, 54868568900, 63402051001
	Metaproterenol	00054355140, 00054355240, 00054857604, 00054857904, 00054858004, 00054861411, 00078020953, 00078020957, 00078021026, 00078021133, 00078021305, 00093223001, 00093223201, 00093611716, 00182128301, 00182608040, 00186413001, 00186413101, 00247035030, 00247058841, 00247065865, 00332223009, 00332223209, 00332611738, 00364228301, 00364241716, 00403255518, 00405325516, 00405462901, 00405463001, 00472137348, 00472137748, 00536146285, 00536443701, 00536443801, 00597007017, 00597007018, 00597007130, 00597007175, 00597007201, 00597007401, 00597007862, 00603142258, 00603446421, 00603446521, 00677125401, 00677144533, 00686082905, 00686223009, 00686223209, 00839744269, 00839748506, 00839748606, 00839763907, 00904287860, 00904287960, 00904287961, 00904288016, 11845014401, 11845041213, 38779017100, 38779017101, 38779017104, 38779017105, 38779017108, 38779017110, 38779017125, 38779017150, 49452455501, 49452455502, 49452455504, 49502067603, 49502067624, 49502067803, 49502067824, 49884025901, 49884036048, 49884036148, 50550036420, 50550036520, 51432042303, 51432053325, 51432064120, 51432074325, 51552007902, 51552007905, 51552007906, 51552007907, 51552007925, 51552007999, 52959015500, 52959015806, 52959038603, 52959095260, 52959100300, 52959139603, 53002038392, 53002038395, 53002042400, 53002042420, 53002053030, 53002092572, 54124007301, 54124007304, 54124007306, 54124037430, 54569004600, 54569006802, 54569006900, 54569169001, 54569196702, 54569196800, 54569196801, 54569273200, 54569274200, 54569274202,

COPD = chronic obstructive pulmonary disease; SABA = short-acting β 2 agonists.

Drug Class	Generic Name	NDCs
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Short-acting bronchodilators (cont'd)

SABAs (cont'd)	Metaproterenol (cont'd)	54569274500, 54569275400, 54569275401, 54569275500, 54569308800, 54569345200, 54838050780, 54868104301, 54868250901, 54868317900, 55045134302, 55045134308, 55045174802, 55045174803, 55175150800, 55175150808, 55175150901, 55175152101, 55175446201, 55175446203, 55289003604, 55289054408, 55289054460, 58016033024, 58016040200, 58016040330, 58016040412, 58016040424, 58016040436, 58016402101, 58016623701, 58016631501, 58016653700, 58016653701, 60258039016, 60346014130, 60346026104, 60346042747, 60346072330, 60346076704, 60432065016, 60432067601, 60432067630, 60505080701, 60505080801, 60505580209, 62991109901, 62991109902, 62991109903, 62991109904, 62991109905, 62991109906, 63370015320, 63370015325, 63370015335, 63629186601, 63874070112
	Terbutaline	00028555787, 00028555788, 00028750701, 00028750723, 00068070220, 00143974610, 00703127104, 17478093301, 55390010110, 55390019310, 63323066501, 66591043411, 66591043412, 66591043511, 00028007201, 00028007210, 00028007261, 00028007265, 00068072561, 00115261101, 00527131801, 00527131810, 68084025621, 00028010501, 00028010510, 00028010561, 00028010565, 00068075061, 00115262201, 00527131101, 00527131110, 68084025721, 00028555787, 00028555788, 00028750701, 00028750723, 00068070220, 00143974610, 00703127104, 17478093301, 55390010110, 55390019310, 63323066501, 66591043411, 66591043412, 66591043511, 00028007201, 00028007210, 00028007261, 00028007265, 00068072561, 00115261101, 00527131801, 00527131810, 68084025621, 00028010501, 00028010510, 00028010561, 00115262201, 00527131101, 00527131110, 68084025721, 00028555787, 00028555788, 00028750701, 00028750723, 00068070220, 00143974610, 00703127104, 17478093301, 55390010110, 55390019310, 63323066501, 66591043411, 66591043412, 66591043511, 00028007201, 00028007210, 00028007261, 00028007265, 00068072561, 00115261101, 00527131801, 00527131810, 68084025621, 00028010501, 00028010510, 00028010561, 00028010565, 00068075061, 00115262201, 00527131101, 00527131110, 68084025721
	Pirbuterol	00089079021, 00089081521, 00089081710, 29336081521, 54569225300, 54569461500, 54868282101, 55175520501, 99207028040
SAMA	Ipratropium	00054004544, 00054004641, 00054840211, 00054840213, 00054840221, 00054840411, 00054840413, 00054840421, 00172640744, 00172640749, 00378698962, 00378698964, 00378698966, 00378698993, 00378797052, 00378797055, 00378797091, 00378797093, 00403064518, 00472075123, 00472075130, 00472075160, 00472075323, 00472075330, 00472075360, 00487980101, 00487980102, 00487980125, 00487980130, 00487980160, 00591379830, 00591379860, 00591379883, 00597008062, 00597008130, 00597008214, 00597008218, 00597008676, 00597008717, 00781715729, 00781715764, 00781715786, 12280009430, 12280037213, 16252009822, 16252009833, 16252009866, 21695091125, 21695091130, 23490576101, 24208039830, 24208039915, 35356012425, 37803090903, 37803090904, 37803090905, 37803090908, 38779023003, 38779023004, 38779023005, 38779023006, 38779056910, 38779056911, 38779056915, 38779056925, 42254004125, 42254035515, 49502068503, 49502068524, 49502068526, 49502068529, 49502068530, 49502068531, 49502068533, 49502068560, 49502068561, 49502068562, 49502078530, 49502078615, 49999038930, 51552039301, 51552039302, 51552039304, 51552039305, 51552039325, 51552039399, 51927164800, 52372063201, 52372063202, 52372063203, 52372063204, 53002084101, 54569100600, 54569442000, 54569442100, 54569491000, 54569575700, 54868143901, 54868408200, 54868408201, 54868428400, 54868504900, 54868551100, 54868556500, 54868575100, 55045193005, 55175138201, 58016608901, 60346013747, 60505080601, 60505082601, 60505082701, 62451008130, 62451008676, 62991108501, 62991108502, 62991108503, 62991108504, 62991108505, 62991108506, 63370012010, 63370012015, 63370012025, 63370012035, 63370012050, 65271000112, 65271000125, 65271000130, 65271000160, 66794000225, 66794000230, 66794000260, 68115077114, 76204010001, 76204010025, 76204010030, 76204010060

COPD = chronic obstructive pulmonary disease; SABA = short-acting β 2 agonists; SAMA = short-acting muscarinic antagonist.

Drug Class	Generic Name	NDCs
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Short-acting bronchodilators (cont'd)

SABA+SAMA	Albuterol; ipratropium	00093672373, 00093672374, 00185732213, 00185732230, 00185732260, 00378698858, 00378698891, 00378698893, 00378967131, 00378967158, 00378967191, 00378967193, 00378967198, 00487020101, 00487020102, 00487020103, 00487020160, 00591343330, 00591343360, 00591381730, 00591381760, 00597001314, 00597002402, 00781714629, 00781714664, 16252054733, 16252054766, 42254040130, 49502067230, 49502067231, 49502067260, 49999099007, 54569460000, 54569543200, 54569640600, 54868094800, 54868422500, 54868597400, 55045316200, 68115077615, 76204060001, 76204060005, 76204060012
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Inhaled corticosteroids

ICSs	Budesonide	00093681545, 00093681573, 00093681645, 00093681673, 00186042504, 00186042604, 00186070210, 00186091542, 00186091612, 00186091706, 00186107006, 00186107008, 00186107509, 00186198804, 00186198904, 00186199004, 00378715501, 00378715505, 00591376730, 00591376830, 21695029101, 49452192601, 49452192602, 49884050101, 49999099532, 51079002001, 51079002003, 51552066801, 51552066802, 51552066804, 51552066809, 51552066850, 54569405900, 54569474100, 54569491900, 54569516200, 54569516300, 54569524800, 54569592800, 54868342300, 54868355000, 54868355300, 54868429500, 54868441100, 54868441101, 54868491000, 54868491001, 54868491002, 54868491003, 54868562100, 54868577400, 54868584400, 55045220203, 55045220303, 65483070210, 67263034301, 68012030930
	Ciclesonide	54868598900, 54868599000, 54868602000, 63402070101, 63402071101, 63402071201, 63402073760
	Flunisolide	00004170809, 00004290603, 00033290640, 00456067299, 24208034425, 38779040600, 38779040606, 38779040611, 38779040653, 51479003725, 51479003825, 51927179400, 52959013100, 52959119800, 53002093787, 54569025300, 54569101300, 54569473500, 54868101501, 54868188301, 54868416200, 55045166408, 55045186803, 55175256901, 58016487801, 59310003725, 59310003825, 60346037296, 60505082400, 64980050625, 64980051025, 68115065201, 75989055012, 00456067099, 54569397600, 54868529400, 55045252007, 60346028274, 68115065301
	Flunisolide/ menthol	00456067299, 00456067099
	Fluticasone	00173075300, 35356047410, 54868616800

COPD = chronic obstructive pulmonary disease; ICSs = inhaled corticosteroids; SABA = short-acting β_2 agonist; SAMA = short-acting muscarinic antagonist.

Drug Class	Generic Name	NDCs
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Inhaled corticosteroids (cont'd)

ICSs	Mometasone	00085037001, 00085037002, 00085056701, 00085056702, 00085085401, 00085085402, 00085119701, 00085128801, 00085134101, 00085134102, 00085134103, 00085134104, 00085134106, 00085134107, 00085146102, 00085146107, 00085314901, 00085314903, 00115146946, 00115146952, 00115147046, 00115147052, 00115147154, 00115147155, 00168027015, 00168027046, 00168027115, 00168027146, 00168027230, 00168027260, 00247046315, 00403254118, 00713063415, 00713063437, 00713063515, 00713063537, 00713070153, 00713070185, 00781706619, 00781706627, 00781706730, 00781706761, 00781706819, 00781706827, 12280039417, 21695078615, 21695078645, 23490709401, 23490709504, 35356009914, 38779241300, 38779241302, 38779241304, 38779241306, 38779241308, 38779241309, 42254017545, 42254038417, 45802011846, 45802011859, 45802011937, 45802011942, 45802025735, 45802025742, 46144013105, 49999047450, 51672130503, 51672130504, 51672131101, 51672131106, 51672131501, 51672131506, 51927450600, 52959060315, 52959060345, 52959073601, 52959073602, 52959079800, 52959085945, 52959145701, 52959145704, 52959145745, 53002083267, 54569201100, 54569261900, 54569460100, 54569520800, 54569520900, 54569591400, 54868222300, 54868222301, 54868222400, 54868222500, 54868375700, 54868417400, 54868545500, 54868545501, 54868554700, 54868554701, 54868554702, 54868622000, 54868622001, 55045157205, 55045292201, 55045343005, 55045343006, 55175158705, 55175159805, 55175528501, 58016324101, 58016473801, 58016560501, 59723005601, 59930152601, 59930152602, 59930154702, 59930154703, 60346023117, 67405010015, 67405010045, 67405027530, 67405027560, 67405030015, 67405030045, 68030750401, 68462019217, 68462019255, 68462022517, 68462022555, 68462038502, 68462038537, 75839002510, 68712003201
	Mometasone furoate/ ammonium lactate	68712003201

Systemic corticosteroids

SCSs	Methylprednisolone	00009002001, 00009004902, 00009005602, 00009005602, 00009005603, 00009005604, 00009005604, 00009005605, 00009005605, 00182105001, 00182105003, 00182105003, 00247001221, 00247001230, 00247036221, 00247036240, 00247036250, 00247136501, 00247136520, 00247136521, 00254421613, 00254421628, 00349827901, 00349827901, 00349827921, 00364046701, 00364046701, 00364046721, 00364046721, 00405466601, 00527129607, 00536403601, 00536403601, 00536403644, 00536403644, 00555030102, 00555030138, 00555030138, 00591079001, 00591079001, 00591079021, 00603459315, 00603459315, 00603459321, 00603459321, 00615253501, 00615253510, 00615253521, 00615253521, 00677056501, 00677056501, 00677056513, 00677056513, 00677183101, 00677183101, 00677183113, 00677183113, 00781140201, 00781140201, 00781140207, 00781140207, 00781502201, 00781502207, 00781502207, 00814478114, 00814478121, 00839622406, 00839622458, 00839622458, 00904217519, 00904217519, 00904217560, 10544032221, 11845012019, 16590014921, 18837008621, 21695008021, 23629004901, 23629004901, 23629049001, 33358024121, 49884049059, 51285030102, 51285030102, 51285030121, 51285030121, 51991018801, 51991018821, 51991018831, 51991018831, 51991018831, 52544079001, 52544079001, 52544079021, 52959010000, 52959108300, 54569032700, 54569103600, 54868291300, 54868291301, 54868291302, 54868662401, 55045125909, 55289064998, 55887095321, 56126032611, 57866403701, 58016200401, 59746000103, 59746000106, 59746000106, 59762332701, 59762332701, 59762332702, 59762444002, 59762444002, 59762444003, 59762444003, 61392013630,
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COPD = chronic obstructive pulmonary disease; ICSs = inhaled corticosteroids; SCSs = systemic corticosteroids.

Drug Class	Generic Name	NDCs
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Systemic corticosteroids (cont'd)

SCSs	Methylprednisolone (cont'd)	61392013631, 61392013632, 61392013639, 61392013645, 61392013651, 61392013660, 61392013690, 61392013691, 62269035121, 62269035121, 62269035124, 63304059122, 63304059122, 63739016110, 63739016110, 63739016115, 63874041321, 66116066221, 66267096121, 66993084002, 67253036010, 67253036010, 67253036021, 67253036021, 68001000501, 68387017001, 00009002201, 59746000204, 59762004901, 66993084225, 59746000314, 59762005001, 00009015501, 00009017601, 59746001504, 00009027401, 00364674854, 00402019510, 00536537070, 00009028002, 00009028051, 00009028052, 00009307301, 00009307303, 00182106762, 00364306446, 00364306451, 00364306453, 00364306454, 00456107105, 00536534065, 00536538065, 00677049220, 00677153820, 00703003101, 00703003104, 00703004301, 00703004501, 00781305575, 00781313171, 00781313195, 00781313670, 00839620025, 00009030602, 00009030612, 00182313262, 00259035705, 00259038805, 00314084175, 00364306546, 00364306553, 00456107205, 00456488005, 00536535165, 00536538565, 00677153920, 00703005101, 00703005104, 00703006301, 00781313271, 00781313775, 00839620125, 00009069801, 00009338901, 00074560344, 55390021901, 55390025901, 63323026530, 00009011312, 00009011313, 00074568401, 00409321705, 00409568401, 00409568423, 55390020910, 00009075801, 00009076502, 00009088701, 00074560144, 00074563004, 55390021801, 55390025801, 00009019009, 00009019010, 00009019016, 00409321805, 00409568502, 00409568523, 00641250641, 55390021010, 00009079601, 00009003928, 00009004722, 00009000302, 00009001820
	Prednisone	00054372250, 00054372263, 00054872216, 00451120104, 00451120108, 00032280801, 00032280810, 00032280810, 00054474125, 00054474125, 00054474131, 00054873925, 00054873925, 00085084303, 00085084303, 00339577512, 00603533521, 00603533532, 51991045801, 59746017106, 00054874025, 00143142501, 00603533621, 00009004501, 00009004501, 00009004502, 00009004504, 00009004505, 00009004505, 00009004516, 00032281001, 00032281001, 00032281010, 00032281010, 00054472825, 00054472831, 00054472831, 00054872425, 00054872425, 00115429401, 00131222881, 00131222881, 00143147501, 00143147501, 00143147510, 00143147525, 00143974001, 00143974001, 00143974010, 00143974010, 00182020110, 00182020189, 00182020189, 00223151501, 00223151502, 00228233696, 00247007200, 00247007203, 00247007204, 00247007205, 00247007210, 00247007212, 00247007215, 00247007220, 00247007221, 00247007224, 00247007227, 00247007230, 00247007236, 00247007240, 00247007244, 00247007245, 00247007248, 00247007250, 00247007252, 00247007260, 00247007261, 00247007280, 00247007299, 00247117621, 00247132360, 00254509413, 00254509423, 00259028401, 00259028401, 00259039021, 00259039148, 00259039148, 00302550001, 00339529312, 00364021801, 00364021801, 00364021802, 00364021802, 00364021890, 00405482801, 00405482803, 00463615510, 00536432410, 00536432410, 00536432450, 00591505201, 00591505201, 00591505210, 00591505210, 00603533215, 00603533221, 00603533221, 00603533231, 00603533231, 00603533232, 00603533715, 00603533715, 00603533721, 00603533721, 00603533732, 00603533732, 00615053613, 00615053613, 00615053653, 00615053663, 00677011701, 00677011701, 00677011710, 00686003220, 00781149501, 00781149501, 00781149510, 00781149510, 00781149513, 00814628514, 00814628530, 00839514306, 00839514306, 00839514316, 00839514358, 00904215719, 00904215719, 00904215746, 00904215760, 00904215760, 00904215761, 00904215761, 00904215780, 00904215780

COPD = chronic obstructive pulmonary disease; SCSs = systemic corticosteroids.

Drug Class	Generic Name	NDCs
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Systemic corticosteroids (cont'd)

SCSs	Prednisone (cont'd)	00904215780, 10768773301, 10768773301, 10768773302, 10768773302, 10768773304, 11845017804, 16590036521, 16590036548, 21695030530, 23490615902, 23490615903, 23490615904, 23490615905, 23490615906, 33358029215, 33358029221, 33358029230, 33358029278, 43063041501, 45802073321, 45802073321, 45802073367, 45802073367, 49999000800, 49999000820, 49999000830, 49999000840, 49999000842, 49999000855, 51079003217, 51079003219, 51079003220, 51079003220, 51655008624, 52544083010, 52544083010, 52959022000, 52959022010, 52959022020, 52959022030, 52959022036, 52959022040, 52959022060, 52959022075, 53489013801, 53489013810, 53489013810, 53489013810, 53489013850, 53489013850, 54569033001, 54569033002, 54569033003, 54569033004, 54569033005, 54569033008, 54569033009, 54569278500, 54569341300, 54569402600, 54569402604, 54569402605, 54569591100, 54868025801, 54868025802, 54868025804, 54868025805, 54868025806, 54868025808, 54868025809, 54868521300, 55045126009, 55045148001, 55045148007, 55045148008, 55289037301, 55289037321, 55289037330, 55289037336, 55289037342, 55289037355, 55289037360, 55289037372, 55289042210, 55289042210, 55887077005, 55887077015, 55887077020, 55887077021, 55887077030, 55887077050, 55887077060, 55887090021, 57480035101, 57480035101, 57866432404, 57866432405, 57866432702, 58016021800, 58016021820, 58016021824, 58016021830, 58016021833, 58016021836, 58016021840, 58016021855, 58016021860, 58016021890, 58016483201, 58864036220, 59746000706, 59746000710, 59746017206, 59746017206, 59746017210, 60760013830, 60904028620, 61392040815, 61392040830, 61392040831, 61392040839, 61392040845, 61392040851, 61392040854, 61392040856, 61392040890, 61392040891, 63629160501, 63629160502, 63739020710, 63739020715, 63739020715, 63739051810, 63739051810, 63874037301, 63874037310, 63874037315, 63874037320, 63874037321, 63874037330, 63874037336, 63874037340, 63874037350, 63874037360, 66267017320, 66267017340, 66267017342, 66267017360, 66267094821, 66336051510, 66336051530, 66336051540, 68084003585, 68115029100, 68115029121, 68115094721, 68258301301, 00009019301, 00009019301, 00009019302, 00009019303, 00009019303, 00032281201, 00032281201, 00032281210, 00054001720, 00054001720, 00054001725, 00054001725, 00054001729, 00054473025, 00054473025, 00054473029, 00054473029, 00054872525, 00143147301, 00143147301, 00143147310, 00143147310, 00143147325, 00143973901, 00143973910, 00143973910, 00182133401, 00182133401, 00182133410, 00182133489, 00182133489, 00223151601, 00223151602, 00228233810, 00228233850, 00228233850, 00247007100, 00247007102, 00247007104, 00247007106, 00247007108, 00247007110, 00247007114, 00247007118, 00247007120, 00247007121, 00247007122, 00247007124, 00247007127, 00247007128, 00247007130, 00247007131, 00247007132, 00247007140, 00247007142, 00247007143, 00247007148, 00247007150, 00247007190, 00247097330, 00247097340, 00254509313, 00254509323, 00259036421, 00259036448, 00259036448, 00259038948, 00259038948, 00259040049, 00259040049, 00339529512, 00349893401, 00349893405, 00364046101, 00364046102, 00364046102, 00364046105, 00364046105, 00364046190, 00403196518, 00403196718, 00405482901, 00405482902, 00440816620, 00463614010, 00536432501, 00536432501, 00536432510, 00591544201, 00591544201, 00591544205, 00591544205, 00591544210, 00603533315, 00603533315, 00603533321, 00603533321, 00603533331, 00603533332, 00603533332, 00603533815, 00603533815, 00603533821, 00603533828, 00603533828, 00603533831, 00603533831, 00603533832, 00603533832,
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COPD = chronic obstructive pulmonary disease; SCSs = systemic corticosteroids.

Drug Class	Generic Name	NDCs
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Systemic corticosteroids (cont'd)

SCSs	Prednisone (cont'd)	00615359343, 00615359353, 00615359363, 00677069801, 00677069801, 00677069805, 00677069810, 00677069810, 00781150001, 00781150001, 00781150010, 00814628814, 00814628828, 00839152006, 00839152006, 00839152012, 00839152016, 00839152016, 00904214160, 00904214160, 00904214161, 00904214180, 00904214180, 10768728301, 10768728301, 10768728303, 10768728304, 11845017904, 16590040410, 16590040420, 16590040430, 16590040445, 16590062421, 18837026721, 18837026730, 21695030620, 21695030621, 21695030628, 21695030630, 21695030642, 23490615701, 23490615702, 23490615703, 23490615704, 23490615705, 23490615707, 23490615708, 33358029320, 33358029330, 33358029340, 43063042610, 43063042620, 43063042621, 43063042630, 43063042640, 43063042650, 43063042660, 45802030321, 45802030321, 45802030367, 49999002805, 49999002812, 49999002814, 49999002815, 49999002820, 49999002828, 49999002830, 49999002840, 49999002848, 49999002850, 49999002890, 51079003317, 51079003319, 51079003320, 51079003320, 51655002052, 51655002053, 52544083101, 52544083101, 52544083110, 52959012600, 52959012605, 52959012607, 52959012610, 52959012612, 52959012618, 52959012620, 52959012621, 52959012625, 52959012630, 52959012640, 52959012642, 52959012644, 52959012645, 52959012650, 52959012670, 53489013901, 53489013901, 53489013905, 53489013905, 53489013905, 53489013910, 54569033100, 54569033101, 54569033102, 54569033103, 54569033105, 54569033106, 54569033107, 54569033108, 54569033109, 54569330201, 54569330202, 54569330205, 54569330206, 54569330207, 54569384700, 54569584000, 54569584100, 54868083600, 54868083602, 54868083604, 54868083605, 54868083607, 54868083608, 54868083609, 54868409500, 54868523000, 55045153303, 55045153306, 55045153307, 55045153309, 55045328103, 55045328104, 55175276601, 55175276608, 55289043801, 55289043820, 55289043821, 55289043830, 55289043836, 55289043842, 55289043850, 55289043860, 55289043897, 55289042310, 55887064301, 55887064305, 55887064310, 55887064315, 55887064320, 55887064330, 55887064337, 55887064340, 55887064342, 55887064350, 55887064390, 55887069621, 57480035201, 57866432501, 57866432502, 57866432507, 57866432508, 58016012612, 58016012612, 58016012612, 58016012612, 58016012612, 58016012615, 58016012620, 58016012621, 58016012624, 58016012628, 58016012632, 58016012640, 58016012650, 58016012660, 58016012690, 58864042320, 58864042330, 58864042340, 59746000806, 59746000810, 59746017306, 59746017309, 59746017310, 60760063028, 61392041715, 61392041731, 61392041732, 61392041739, 61392041739, 61392041745, 61392041751, 61392041756, 61392041760, 61392041790, 61392041791, 63629157901, 63629157903, 63739020810, 63739020810, 63739020815, 63739020815, 63739051910, 63874032701, 63874032702, 63874032710, 63874032712, 63874032715, 63874032718, 63874032719, 63874032720, 63874032721, 63874032725, 63874032728, 63874032730, 63874032732, 63874032740, 63874032750, 63874032760, 66267017115, 66267017120, 66267017121, 66267017140, 66267017142, 66267017148, 66336005810, 66336005812, 66336005821, 66336005830, 66336005840, 66336005860, 68115028910, 68115028930, 68115028942, 68387024115, 00009016501, 00009016501, 00009016502, 00009016503, 00009016503, 00032281401, 00032281401, 00032281410, 00054001820, 00054001820, 00054001820, 00054001825, 00054001825, 00054001829, 00054472925, 00054472925, 00054472929, 00054472929, 00054872625, 00143147701, 00143147701, 00143147705, 00143147705, 00143147710, 00143147725, 00143973801, 00143973801, 00143973805, 00143973810, 00143973810, 00182108601, 00182108601, 00182108610, 00182108689, 00182108689, 00223151701, 00223151702, 00228233710, 00228233710,
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COPD = chronic obstructive pulmonary disease; SCSs = systemic corticosteroids.

Drug Class	Generic Name	NDCs
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Systemic corticosteroids (cont'd)

SCSs	Prednisone (cont'd)	00228233750, 00228233750, 00247010000, 00247010001, 00247010002, 00247010004, 00247010005, 00247010006, 00247010007, 00247010008, 00247010010, 00247010012, 00247010013, 00247010014, 00247010015, 00247010018, 00247010020, 00247010021, 00247010024, 00247010027, 00247010040, 00247010042, 00247010090, 00247174712, 00339577712, 00364044201, 00364044201, 00364044202, 00364044202, 00364044205, 00364044290, 00364044290, 00405483001, 00405483002, 00440216720, 00463614110, 00536432601, 00536432601, 00536432605, 00536432605, 00591544301, 00591544301, 00591544305, 00591544305, 00591544310, 00603533421, 00603533421, 00603533432, 00603533432, 00603533921, 00603533928, 00603533928, 00603533932, 00603533932, 00615154243, 00615154263, 00677042701, 00677042701, 00677042705, 00677042705, 00677042710, 00686002220, 00781148501, 00781148501, 00814629014, 00839151706, 00839151706, 00839151712, 00839151712, 00904214060, 00904214061, 00904214061, 00904214080, 00904214080, 10768708501, 11845018001, 11845018004, 16590032610, 16590032620, 16590032621, 16590032645, 16590032660, 18837035310, 18837035330, 21695030710, 21695030715, 21695030718, 21695030720, 21695030721, 21695030730, 23490615801, 23490615802, 23490615803, 23490615804, 23490615805, 23490615808, 23490615809, 33358029415, 33358029420, 33358029430, 33358029460, 43063009703, 43063009706, 43063043210, 43063043212, 43063043220, 43063043221, 43063043230, 49999011000, 49999011006, 49999011010, 49999011012, 49999011014, 49999011015, 49999011018, 49999011021, 49999011030, 51079002217, 51079002219, 51079002220, 51991046201, 51991046205, 52544083201, 52544083201, 52544083205, 52959012700, 52959012707, 52959012710, 52959012712, 52959012715, 52959012720, 52959012721, 52959012725, 52959012730, 52959012737, 52959012742, 53489014001, 53489014001, 53489014005, 53489014005, 54569033200, 54569033201, 54569033202, 54569033203, 54569033204, 54569033208, 54569033209, 54569304300, 54569304301, 54569304302, 54569304304, 54569304305, 54569304306, 54569401700, 54868118300, 54868118302, 54868118303, 54868118307, 54868118308, 54868118309, 55045144403, 55045144404, 55045144407, 55045144408, 55289035205, 55289035209, 55289035210, 55289035212, 55289035214, 55289035215, 55289035221, 55289035230, 55289035297, 55829042410, 55829042410, 55887079610, 55887079612, 55887079615, 55887079618, 55887079620, 55887079630, 55887079642, 55887079660, 55887079690, 57480047201, 57866432601, 57866432602, 57866432604, 57866432605, 57866432607, 58016021700, 58016021710, 58016021715, 58016021716, 58016021718, 58016021721, 58016021722, 58016021724, 58016021728, 58016021730, 58016021760, 58864042414, 58864042420, 58864042430, 59746017506, 59746017509, 59746017510, 60760000221, 61392076130, 61392076131, 61392076139, 61392076145, 61392076151, 61392076154, 61392076160, 61392076191, 62584083401, 63629158701, 63629158702, 63629158703, 63739020910, 63739020910, 63739020915, 63739020915, 63739052010, 63874039201, 63874039202, 63874039206, 63874039210, 63874039214, 63874039220, 63874039221, 63874039224, 63874039228, 63874039230, 66267017210, 66267017215, 66267017220, 66267017230, 66267017242, 66336009418, 66336009420, 66336009430, 68115029015, 68115029020, 68387024010, 68387024025, 00009038801, 00009038801, 00032281601, 00054001920, 00054001925, 00054473325, 00054473325, 00054872925, 00143148125, 00339529612, 00536432801, 00536432801, 00781145001, 00781145013, 00781145013, 00904052760, 00904052760, 52544079701, 54569033300, 54569033304, 00054372144, 75987002001, 75987002101, 75987002201
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COPD = chronic obstructive pulmonary disease; SCSs = systemic corticosteroids.

Drug Class	Generic Name	NDCs
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Systemic corticosteroids (cont'd)

SCSs	Triamcinolone	00469512150, 00469512271, 57317060110, 00115484001, 00364035201, 00469512316, 00469512471, 00603617014, 00615052726, 00839500906, 00904088444, 00904088460, 57317060010, 57317060016, 57317060030, 00469512550, 00075006037, 00003049420, 00781324375, 00023021805, 00003029305, 00003029320, 00003029328, 00182114162, 00182114185, 00364672846, 00364672853, 00402020401, 00402020405, 00456078105, 00536981065, 00677060020, 00781311675, 00781324572, 00839628725, 00904088605, 58441029307, 63252029307, 00182306462, 00364308153, 00364666653, 00402004205, 00456106005, 00469511601, 00469511605, 00536980065, 00677098120, 00839505725, 57317020201, 57317020205, 00469511705, 57317020305, 00469511805, 00781308475, 54643010540, 54643105400, 57317020605, 00469511901, 00469511905, 00781308571, 00781308575, 00781608575, 54643010550, 54643010560, 54643105500, 54643105600, 57317020501, 57317020505, 00574045005, 00574045010, 00802395817, 00802395818, 00802395819, 39822530005, 00074301460, 60598006160
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PDE-4 inhibitors

PDE-4	Roflumilast	00456009530, 00456009563, 00456009590
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Methylxanthines

MXs	Aminophylline	00074490619, 00074490918, 00074592101, 00074592201, 00074738501, 00074738601, 00409592101, 00409592201, 00409738501, 00409738601, 00517381025, 00517382025, 00839567330, 00536130119, 00603802010, 00713012509, 00713012525, 00054304563, 00054804916, 00054805016, 00472087308, 00536020259, 00677078942, 00904261609, 00223501200, 00536131019, 00713010309, 00713010325, 00713010350, 00054402525, 00054402525, 00054402531, 00054402531, 00054802525, 00054802525, 00115215001, 00115215003, 00143102001, 00143102001, 00143102010, 00143102010, 00182010901, 00182010910, 00223010001, 00223010002, 00364000401, 00364000401, 00405406001, 00405406003, 00463600110, 00536304601, 00536304601, 00536304610, 00591790401, 00615160801, 00615160801, 00615160810, 00615160810, 00615160813, 00615160813, 00677000301, 00677000301, 00677000310, 00677000310, 00781121401, 00781121401, 00814062530, 00839505316, 00839505316, 00904227360, 00904227360, 00904227380, 00904227380, 00054402625, 00054402625, 00054402625, 00054402631, 00054402631, 00054802625, 00054802625, 00115215801, 00115215803, 00143102501, 00143102501, 00143102510, 00143102510, 00182011001, 00182011010, 00223010201, 00223010202, 00364000501, 00364000501, 00405406101, 00405406103, 00463600310, 00536306001, 00536306001, 00536306010, 00536306010, 00591790501, 00615160601, 00615160601, 00615160610, 00615160610, 00615160613, 00615160613, 00677000701, 00677000701, 00677000710, 00677000710, 00781131801, 00781131801, 00781131801, 00781131810, 00814062730, 00839101106, 00839101116, 00839101116, 00904228360, 00904228360, 00904228361, 00904228361, 00904228380, 00904228380, 00034022580
	Dyphylline	00037051568, 00037051569, 00281111874, 00037053701, 00281111231, 00037052185, 00037052192, 00037052197, 00093003001, 00281111553, 00281111557, 00281111563, 00904155660, 00037073192, 00037073197, 00093003701, 00281111653, 00281111657, 00281111663, 00677103601, 00904155760
	Dyphylline - guaifenesin	00037054568, 00037054569, 00182137540, 00223613601, 00472123816, 00603119058, 00904155516, 45565030617, 46672061416, 50383080616, 50732089716, 50732089728, 54838051380, 60258033516, 00281112774, 00525030116, 00551012401, 00551020501, 45985063308, 50991020016, 00037054185, 00037054192, 00037054197, 00281112453, 00281112457, 00281112463, 00551012301, 00677103701, 00677178001,

COPD = chronic obstructive pulmonary disease; MXs = methylxanthines; PDE-4 = PDE-4 inhibitors; SCSs = systemic corticosteroids.

Drug Class	Generic Name	NDCs
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Methylxanthines (cont'd)

MXs	Dyphylline-guaifenesin	00904155860, 15370002110, 45565030501, 45565030503, 50991040001, 59243002110, 60258033601, 51991053601, 50991041301, 00037054568, 00182137540, 00223613601, 00472123816, 00536069085, 00603119058, 45565030617, 46672061416, 50383080616, 50732089716, 50732089728, 54838051380, 60258033516, 00281112774, 00525030116, 00551012401, 00551020501, 00281112463, 00551012301, 00677103701, 00677178001, 00904155860, 45565030501, 45565030503, 50991040001, 50991040005, 59243002110, 51991053601, 50991041301
	Guaifenesin	00031862412, 00031862413, 00031862418, 00031862421, 00031862425, 00031872412, 00037421410, 00043626204, 00054333750, 00054833704, 00054833904, 00113006126, 00113006134, 00113028826, 00121041904, 00121041910, 00121041915, 00121074404, 00121074416, 00121174405, 00121174415, 00182025937, 00182025940, 00182025941, 00182103411, 00223626301, 00223626302, 00223626303, 00372000604, 00472006116, 00472006194, 00472041904, 00472041916, 00472041928, 00472041994, 00536082547, 00536082585, 00536082597, 00603085754, 00603085756, 00603085781, 00603085794, 00603132858, 00677052933, 00677170433, 00879077504, 00879077516, 00879077528, 00904006100, 00904006109, 00904006120, 00904006128, 00904606120, 24385031026, 24385031034, 37205096034, 49348027834, 49348027837, 50383006306, 50383006307, 50383006312, 50383006317, 50383006318, 50383010308, 51079032630, 51079032830, 52297004334, 52735042041, 52735042044, 54838011740, 54838013840, 55422040804, 55422040808, 55422049104, 55532601008, 59390002135, 59390002141, 59390009841, 59390009846, 60258025616, 60432000804, 60432007916, 60569006104, 60814011604, 60814011608, 61787006304, 62174008007, 62174008010, 63824017364, 63824027364, 53014040210, 00024105010, 00037431201, 00182261401, 00259028801, 00603488621, 00677155401, 00677166101, 00839797706, 00904515460, 59743001901, 61355050210, 61355050250, 00095060001, 00182118801, 00536444705, 00551018901, 00603554321, 00603554324, 00603554328, 00677147505, 00682000601, 00839765506, 00904613339, 00904613395, 00904775970, 11808030001, 11808030005, 12830077701, 36382400832, 43567050107, 43797004803, 45802049801, 45802049849, 45802049858, 45802049878, 45985063101, 49348090547, 49348090559, 50111053501, 51285041702, 51285041704, 51479000901, 51479000906, 52152010602, 52544043901, 52555062801, 53014001210, 53014001250, 53489042301, 55053004001, 55053004002, 57664015208, 57664015213, 58177020504, 58521028001, 58869032101, 59196000801, 59196000805, 59310010210, 61355050110, 61355050125, 61355050150, 61646012501, 61646012505, 63824000810, 63824000813, 63824000815, 63824000820, 63824000832, 63824000840, 63824000850, 63824000861, 63824000869, 64455000901, 64543013001, 64543013101, 00677177201, 45985063701, 59310010910, 00314021010, 00603350321, 00603377321, 00677164301, 50474062001, 58177030804, 59310012010, 60258025801, 63824002314, 63824002328, 63824002336, 63824002510, 64543012101, 00015565801, 58869042101, 00131421137, 00677181101, 58605051301, 59310011810, 59310011810, 00677192901, 00677192902, 00904575840, 00904575846, 00904575852, 00904623252, 10122010105, 10122010110, 42291031230, 42291031260, 51991060601, 63824015312, 63824025312, 63824015412, 63824025412

COPD = chronic obstructive pulmonary disease; MXs = methylxanthines.

Drug Class	Generic Name	NDCs
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Methylxanthines (cont'd)

MXs	Guaifenesin-theophylline	00087051602, 00087051603, 00677076601, 00839669706, 00904228270, 00904228280, 54092006701, 54092006710, 54092006752, 61570002201, 54092006801, 00075035716, 00472154016, 00472154028, 00839634869, 00904007016, 00456064808, 00456064816, 00485005916, 57779011509, 00087051602, 00087051603, 00677076601, 00839669706, 00904228270, 00904228280, 54092006701, 54092006710, 54092006752, 61570002201, 54092006801, 00075035716, 00472154016, 00472154028, 00839634869, 00904007016, 00456064808, 00456064816, 00485005916, 57779011509
	Potassium iodide-	00223662301, 00223662302, 00456064508, 00472144516, 00472144528, 00904144516
	Theophylline	00456064302, 00075005700, 00075005762, 00085092801, 00256015001, 00075107500, 00075107562, 00085087501, 00047019624, 00070234000, 00075010000, 00075010062, 00075010099, 00093093401, 00182131101, 00258363701, 00603594921, 00839788506, 00047019724, 00070234100, 00075112500, 00075112562, 00093093601, 00182131201, 00258363801, 00364258601, 00603595021, 00839788606, 00131424737, 00256011401, 00047019824, 00070234200, 00075020000, 00075020062, 00075020099, 00093093801, 00182131301, 00258363401, 00364258701, 00536563301, 00603595121, 00839788706, 00075135600, 00075135699, 00131424837, 00256011501, 50474026812, 00047019924, 00070234300, 00075030000, 00075030062, 00075030099, 00093094001, 00182131401, 00258362501, 00364258801, 00536563401, 00603595221, 00839788806, 00904784960, 50474040001, 50474040060, 00047291223, 00047291223, 00054884504, 00054884504, 00054884604, 00054884604, 00054884816, 00054884816, 00121013715, 00121013715, 00121013730, 00121013730, 00182022640, 00182022640, 00182022641, 00182022641, 00247030852, 00364706016, 00364706016, 00405382516, 00456064416, 00456064416, 00456064428, 00456064428, 00456064432, 00456064432, 00463903116, 00472144416, 00472144416, 00472144428, 00472144428, 00536210085, 00536210085, 00536210090, 00536210090, 00603172958, 00603172958, 00677152333, 00677152333, 00781660016, 00781660016, 00781660028, 00781660028, 00839502969, 00839502969, 00839502970, 00839502970, 00879022616, 00879022616, 00879022628, 00879022628, 00904144416, 00904144416, 00904144428, 00904144428, 49708064490, 60432001916, 60432001916, 60432001928, 60432001928, 00054384163, 00054384163, 00054384168, 00054384168, 00089096016, 00089096016, 00121479415, 00223630801, 00223630802, 00426801916, 00426801916, 00426801928, 00426801928, 00436050628, 00496060902, 00556014916, 00556014916, 00556014928, 00556014928, 00677055633, 00677055633, 00814778582, 51862013116, 54838055680, 55053026016, 00075365016, 00075365016, 00131509870, 00131509870, 00131509872, 00131509872, 00075035168, 00075035168, 00814780114, 00814780128, 00089034210, 00075035268, 00075035268, 00089034410, 00087051941, 00087051941, 00087051944, 00087051944, 54092006901, 54092006901, 61570002001, 00047065724, 00047065724, 00085048701, 00085048701, 00085048705, 00085048705, 00085048710, 00085048710, 00085048750, 00085048750, 00085048781, 00085048781, 00086003110, 00086003110, 00086003150, 00086003150, 00093059901, 00093059901, 00182158901, 00182158901, 00182158989, 00182158989, 00247082406, 00247082410, 00247082430, 00247082460, 00247082490, 00258358401, 00258358401, 00258358405, 00258358405, 00349828001, 00349828001, 00349868301, 00349868301, 00364068001, 00364068001, 00405498601, 00456358401, 00456358405, 00456431001, 00456431001, 00456431002, 00490008000, 00490008030, 00490008060, 00490008090, 00536465001, 00536465001, 00603594421, 00603594421, 00603594428, 00603594428, 00677084501, 00677084501, 00781100301, 00781100301, 00839673006, 00839673006, 00839673012, 00839673012, 00839770506, 00839770506, 00904161040, 00904161040, 00904161060, 00904161060, 00904161061, 00904161061, 00904588761, 00904588761, 17236033501,

COPD = chronic obstructive pulmonary disease; MXs = methylxanthines.

Drug Class	Generic Name	NDCs
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Methylxanthines (cont'd)

MXs	Theophylline (cont'd)	<p>17236033505, 17236033505, 49502043101, 49502043101, 49999092130, 50111048301, 50111048301, 50111048302, 50111048302, 50111048303, 52555070201, 52555070201, 54569031801, 54569203200, 54868146101, 54868146102, 55045376808, 57480036501, 57480036501, 57480036506, 57480036506, 57480036506, 59930165001, 59930165001, 59930165002, 59930165002, 59930165003, 63629355101, 63874044301, 63874044315, 63874044320, 63874044330, 65162033510, 00034710280, 00034710280, 00047065924, 00047065924, 00047065930, 00047065930, 00085093301, 00085093301, 00085093305, 00085093305, 00085093310, 00085093310, 00085093350, 00085093350, 00085093381, 00085093381, 00086003210, 00086003210, 00086003250, 00086003250, 00086003290, 00086003290, 00086003290, 00089034110, 00089034110, 00089034180, 00089034180, 00093058801, 00093058801, 00182159001, 00182159001, 00182159010, 00182159010, 00182159089, 00182159089, 00247007000, 00247007002, 00247007009, 00247007010, 00247007012, 00247007020, 00247007030, 00247007050, 00247007052, 00247007060, 00247007090, 00258358301, 00258358301, 00258358305, 00258358305, 00258358310, 00258358310, 00349828101, 00349828101, 00349828105, 00349828105, 00349828110, 00349828110, 00349828160, 00349828160, 00349868401, 00349868410, 00349868410, 00364068101, 00364068101, 00364068105, 00364068105, 00405498701, 00405498702, 00456358301, 00456358305, 00456358310, 00456432000, 00456432000, 00456432001, 00456432001, 00456432002, 00536465101, 00536465101, 00536465105, 00536465105, 00536465110, 00536465110, 00603594521, 00603594521, 00603594528, 00603594528, 00603594529, 00603594529, 00603594532, 00603594532, 00659280525, 00677084601, 00677084601, 00677084605, 00677084605, 00781100401, 00781100401, 00781100405, 00781100405, 00814780214, 00814780228, 00839672906, 00839672906, 00839672912, 00839672912, 00839672916, 00839672916, 00839770606, 00839770606, 00839770612, 00839770612, 00904161140, 00904161140, 00904161160, 00904161160, 00904161161, 00904161161, 00904161180, 00904161180, 00904588861, 11845035904, 17236032401, 17236032401, 17236032405, 17236032410,</p> <p>17236032410, 49502043201, 49502043201, 50111048201, 50111048201, 50111048202, 50111048202, 50111048203, 50111048203, 52555070301, 52555070301, 52555070310, 52555070310, 54569248200, 54569248201, 54569248205, 54569858600, 54868002800, 54868002801, 54868002802, 54868002803, 54868002805, 55175418700, 55175418703, 55175418704, 55289000360, 55289025901, 55289025930, 55289025960, 57480036601, 57480036601, 57480036606, 57480036606, 57866465102, 59930166001, 59930166001, 59930166002, 59930166002, 59930166003, 59930166003, 61392001630, 61392001645, 61392001651, 61392001654, 61392001656, 61392001660, 61392001690, 61392001691, 63874044701, 63874044715, 63874044720, 63874044730, 63874044760, 00089034510, 00597004801, 00047059224, 00047059224, 00047059230, 00047059230, 00085058401, 00085058401, 00085058405, 00085058405, 00085058410, 00085058410, 00085058450, 00085058450, 00085058481, 00085058481, 00086003310, 00086003310, 00086003350, 00086003350, 00086003390, 00086003390, 00089034310, 00089034310, 00089034380, 00089034380, 00093058901, 00093058901, 00182140001, 00182140001, 00182140005, 00182140005, 00182140010, 00182140010, 00182140089, 00182140089, 00247006102, 00247006108, 00247006120, 00247006130, 00247006150, 00247006160, 00247006190, 00247017700, 00247017702, 00247017703, 00247017704, 00247017706, 00247017710, 00247017714, 00247017720, 00247017730, 00247017760, 00258358101, 00258358101, 00258358105, 00258358105, 00258358110, 00258358110, 00349826601, 00349826601, 00349826605, 00349826605, 00349826610, 00349826610, 00349826660, 00349868501, 00349868505, 00349868510, 00349868510, 00364066001, 00364066001, 00364066002, 00364066002, 00364066005, 00364066005, 00405498801, 00405498802, 00456358101, 00456358105, 00456358110, 00456433000, 00456433000, 00456433001, 00456433001, 00456433002, 00456433002, 00536465201, 00536465201, 00536465205, 00536465205, 00536465210, 00536465210, 00603594621, 00603594621, 00603594628, 00603594628,</p>
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COPD = chronic obstructive pulmonary disease; MXs = methylxanthines.

Drug Class	Generic Name	NDCs
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Methylxanthines (cont'd)

MXs	Theophylline (cont'd)	00603594628, 00603594629, 00603594629, 00603594632, 00603594632, 00677081701, 00677081705, 00677081705, 00781100501, 00781100501, 00781100505, 00814780514, 00814780514, 00814780528, 00839669306, 00839669316, 00839669316, 00839770716, 00839770716, 00904161240, 00904161260, 00904161260, 00904161261, 00904161261, 00904161280, 00904588961, 00904588961, 11845036004, 17236032501, 17236032501, 17236032510, 17236032510, 23155006201, 23155006201, 23490735501, 50111045901, 50111045902, 50111045902, 50111045903, 50111045903, 52555070401, 52555070410, 52555070410, 54092007001, 54092007001, 54092007005, 54569006202, 54569006501, 54569006502, 54569006505, 54569248301, 54569248302, 54569248303, 54569858000, 54868002900, 54868002903, 54868002905, 54868002906, 54868002907, 55289015597, 55289026006, 55289026020, 55289026030, 55289026060, 55289026097, 55887084790, 57480036701, 57480036701, 57480036706, 57480036706, 58016047706, 59930167001, 59930167001, 59930167002, 59930167002, 59930167003, 61392001730, 61392001751, 61392001754, 61392001756, 61392001760, 61392001790, 61392001791, 61570001901, 61570001901, 63874067515, 63874067520, 65162032510, 65162032511, 66336059630, 00034700470, 00034700480, 00085069401, 29033000101, 42858070101, 53265038050, 67781025101, 67781025105, 68462038001, 00047059324, 00085080601, 00085080601, 00085080681, 00085080681, 00182194101, 00258361401, 00364249001, 00364249001, 00405499001, 00456434501, 00536465301, 00603574721, 00603574721, 00677141001, 00677141001, 00781192801, 00785434501, 00839765106, 00839765106, 00904161360, 23155006301, 50111051801, 50111051801, 52555070501, 52555070501, 59930168001, 00089034710, 00597004901, 00034700680, 00085081401, 42858070201, 53265038210, 67781025201, 68462035601, 00074766603, 00264955810, 00338044103, 00409766662, 00074766503, 00074766509, 00264955410, 00338043903, 00338043904, 00409766503, 00409766509, 00409766823, 00074767713, 00074767723, 00409767713, 00074770562, 50474020001, 50474020050, 50474020060, 50474030001, 50474030050, 50474010001, 50474010060
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COPD = chronic obstructive pulmonary disease; MXs = methylxanthines.

SUPPLEMENTARY TABLE 7: PROCEDURE CODES FOR OXYGEN THERAPY USE

Code Type	Code	Description
HCPCS	E0424	Stationary compressed gaseous oxygen system, rental; includes container, contents, regulator, flowmeter, humidifier, nebulizer, cannula or mask, and tubing
HCPCS	E0425	Stationary compressed gas system, purchase; includes regulator, flowmeter, humidifier, nebulizer, cannula or mask, and tubing
HCPCS	E0430	Portable gaseous oxygen system, purchase; includes regulator, flowmeter, humidifier, cannula or mask, and tubing
HCPCS	E0431	Portable gaseous oxygen system, rental; includes portable container, regulator, flowmeter, humidifier, cannula or mask, and tubing
HCPCS	E0433	Portable liquid oxygen system, rental; home liquefier used to fill portable liquid oxygen containers, includes portable containers,regulator, flowmeter, humidifier, cannula or mask and tubing, with or without supply reservoir and content gauge
HCPCS	E0434	Portable liquid oxygen system, rental; includes portable container, supply reservoir, humidifier, flowmeter, refill adaptor, contents gauge, cannula or mask, and tubing
HCPCS	E0435	Portable liquid oxygen system purchase; includes portable container, supply reservoir, flowmeter, humidifier, contents gauge, cannula or mask, tubing and refill adaptor
HCPCS	E0439	Stationary liquid oxygen system, rental; includes container, contents, regulator, flowmeter, humidifier, nebulizer, cannula or mask, and tubing
HCPCS	E0440	Stationary liquid oxygen system, purchase; includes use of reservoir, contents indicator, regulator, flowmeter, humidifier, nebulizer, cannula or mask, and tubing
HCPCS	E0441	Oxygen contents, gaseous (for use with owned gaseous stationary systems or when both a stationary and portable gaseous system are owned), 1 month's supply = 1 unit
HCPCS	E0442	Oxygen contents, liquid (for use with owned liquid stationary systems or when both a stationary and portable liquid system are owned), 1 month's supply = 1 unit
HCPCS	E0443	Portable oxygen contents, gaseous (for use only with portable gaseous systems when no stationary gas or liquid system is used), 1 month's supply = 1 unit
HCPCS	E0444	Portable oxygen contents, liquid (for use only with portable liquid systems when no stationary gas or liquid system is used), 1 month's supply = 1 unit
HCPCS	E1390	Oxygen concentrator, single delivery port, capable of delivering 85 percent or greater oxygen concentration at the prescribed flow rate
HCPCS	E1391	Oxygen concentrator, dual delivery port, capable of delivering 85 percent or

		greater oxygen concentration at the prescribed flow rate, each
HCPCS	E1392	Portable oxygen concentrator, rental
HCPCS	E1405	Oxygen and water vapor enriching system with heated delivery
HCPCS	E1406	Oxygen and water vapor enriching system without heated delivery
HCPCS	K0738	Portable gaseous oxygen system, rental; home compressor used to fill portable oxygen cylinders; includes portable containers, regulator, flowmeter, humidifier, cannula or mask, and tubing
HCPCS	K0741	Portable gaseous oxygen system, rental, includes portable container, regulator, flowmeter, humidifier, cannula or mask, and tubing, for cluster headaches
HCPCS	S8120	Oxygen contents, gaseous, 1 unit equals 1 cubic foot
HCPCS	S8121	Oxygen contents, liquid, 1 unit equals 1 pound

SUPPLEMENTARY TABLE 8: GENERIC PRODUCT IDENTIFIER (GPI) CODES FOR SMOKING CESSATION MEDICATIONS

GPI_DRUG_GROUP4_ID	GPI_DRUG_CLASS_DESC
6210	*SMOKING DETERRENTS**

SUPPLEMENTARY TABLE 9: PROCEDURE CODES FOR SMOKING CESSATION COUNSELING

Code Type	Code	Description
HCPCS	G0436	Smoking and tobacco cessation counseling visit for the asymptomatic patient; intermediate, greater than 3 minutes, up to 10 minutes
HCPCS	G0437	Smoking and tobacco cessation counseling visit for the asymptomatic patient; intensive, greater than 10 minutes
HCPCS	S9075	Smoking cessation treatment
HCPCS	S9453	Smoking cessation classes, non-physician provider, per session
HCPCS	C9801	Smoking and tobacco cessation counseling visit for the asymptomatic patient; intermediate, greater than 3 minutes, up to 10 minutes
HCPCS	C9802	Smoking and tobacco cessation counseling visit for the asymptomatic patients; intensive, greater than 10 minutes
HCPCS	G8455	Current tobacco smoker
HCPCS	D1320	Tobacco counseling
HCPCS	G0375	Smoke/tobacco counseling 3-10
HCPCS	G0376	Smoke/tobacco counseling >10
HCPCS	G8402	Smoke preven interven counse
HCPCS	G8403	Smoke preven nocounsel
HCPCS	G8453	Tob use cess int counsel
HCPCS	G8454	Tob use cess int no counsel
ICD-9	305.1	Tobacco use disorder
ICD-9	V15.82	Personal history of tobacco use
ICD-9	V65.42	Counseling on substance use and abuse
ICD-9	649.0	Tobacco use disorder complicating pregnancy, childbirth, or puerperium
ICD-9	989.84	Toxic effect of tobacco
ICD-9	E869.4	Secondhand tobacco smoke (used as secondary code to primary illness)
CPT	99406	Smoking and tobacco use cessation counseling visit; intermediate visit, greater than 3 minutes up to 10 minutes
CPT	99407	Smoking and tobacco use cessation counseling visit; intensive, greater than 10 minutes
CPT	1034F	Current tobacco smoker (CAD, CAP, COPD, PV) (DM)
CPT	4000F	Tobacco use cessation intervention, counseling (COPD, CAP, CAD, Asthma)(DM)(PV)

SUPPLEMENTARY TABLE 10: ALGORITHMS FOR COPD-RELATED OUTPATIENT VISITS, HOSPITALIZATIONS, AND EMERGENCY ROOM VISITS

COPD related physician or outpatient visit

A member will be counted as having an outpatient visit if he/she had a claim for any outpatient visit (physician, clinic, hospital outpatient, etc.) coded with

1. Any of the diagnosis codes in the [table below](#) in the primary position AND a secondary ICD-9-CM code for COPD in any position; OR
2. A COPD diagnosis code in the primary position; OR
3. A diagnosis for respiratory failure (518.81, 518.83, or 518.84 in the primary position AND a secondary ICD-9-CM code for COPD in any position (no hospitalization))

COPD related hospitalization

Those individuals hospitalized with a **principal** diagnosis code for COPD (491.XX, 492.XX, or 496.XX) OR a **principal** diagnosis code for respiratory failure (518.81, 518.83, or 518.84) accompanied by a secondary code for COPD (491.XX, 492.XX, or 496.XX) OR any of the diagnosis codes in the primary position and a secondary ICD-9-CM code for COPD in any position on the same service date will be considered to have a hospitalization.

COPD related emergency room visit

A member will be counted as having a COPD related emergency room (ER) visit if he/she had ER visit coded with:

1. Any of the diagnosis codes in [table below](#) in the primary position AND a secondary ICD-9-CM code for COPD in any position; OR
2. A COPD diagnosis code in the primary position; OR
3. A diagnosis for respiratory failure (518.81, 518.83, or 518.84) in the primary position AND a secondary ICD-9-CM code for COPD in any position

(Note that ER visits resulting in a COPD hospitalization will be considered a hospitalization, not an ER visit.)

ICD-9-CM Code	Description
466-466.19	Acute bronchitis and bronchiolitis
480-486	Viral pneumonia; pneumococcal pneumonia [streptococcus pneumoniae pneumonia]; other bacterial pneumonia; pneumonia due to other specified organism; pneumonia in infectious diseases classified elsewhere; bronchopneumonia, organism unspecified; pneumonia,

ICD-9-CM Code	Description
	organism unspecified
487.0	Influenza
490	Bronchitis, not specified as acute or chronic
491.21	Obstructive chronic bronchitis with (acute) exacerbation
491.22	Obstructive chronic bronchitis with acute bronchitis
493.02	Extrinsic asthma with (acute) exacerbation
493.12	Intrinsic asthma with (acute) exacerbation
493.22	Chronic obstructive asthma with (acute) exacerbation
493.92	Asthma, unspecified type, with (acute) exacerbation
494.1	Bronchiectasis with acute exacerbation
506.0-506.3	Bronchitis and pneumonitis due to fumes and vapors; acute pulmonary edema due to fumes and vapors; upper respiratory inflammation due to fumes and vapors, other acute and subacute respiratory conditions due to fumes and vapors
511.0-511.1	Pleurisy without mention of effusion or current tuberculosis; pleurisy with effusion, with mention of a bacterial cause other than tuberculosis
518.82	Other pulmonary insufficiency, not elsewhere classified

SUPPLEMENTARY TABLE 11: INFLUENZA VACCINE

GPI_DRUG_GROUP8_ID	GPI_DRUG_CLASS_DESC
17100020	*VIRAL VACCINES**

HCPCS	G0008	Administration of influenza virus vaccine
HCPCS	G8482	Influenza immunization administered or previously received
HCPCS	Q2033	Influenza vaccine, recombinant hemagglutinin antigens, for intramuscular use (Flublok)
HCPCS	Q2034	Influenza virus vaccine, split virus, when administered to individuals 3 years of age and older, for intramuscular use (Agriflu)
HCPCS	Q2035	Influenza virus vaccine, split virus, when administered to individuals 3 years of age and older, for intramuscular use (Afluria)
HCPCS	Q2036	Influenza virus vaccine, split virus, when administered to individuals 3 years of age and older, for intramuscular use (Flulaval)
HCPCS	Q2037	Influenza virus vaccine, split virus, when administered to individuals 3 years of age and older, for intramuscular use (Fluvirun)
HCPCS	Q2038	Influenza virus vaccine, split virus, when administered to individuals 3 years of age and older, for intramuscular use (Fluzone)
HCPCS	Q2039	Influenza virus vaccine, split virus, when administered to individuals 3 years of age and older, for intramuscular use (Not Otherwise Specified)
CPT	90630	Influenza virus vaccine, quadrivalent (IIV4), split virus, preservative free, for intradermal use
CPT	90653	Influenza virus vaccine, inactivated, subunit, adjuvanted, for intramuscular use NEW!
CPT	90654	Influenza virus vaccine, split virus, preservative free, for intradermal use
CPT	90655	Influenza virus vaccine, trivalent, preservative free, when administered to children 6-35 months of age, for intramuscular use
CPT	90656	Influenza virus vaccine, trivalent, preservative free, when administered to individuals 3 years and older, for intramuscular use
CPT	90657	Influenza virus vaccine, trivalent, when administered to children 6-35 months of age, for intramuscular use

CPT	90658	Influenza virus vaccine, trivalent, when administered to individuals 3 years and older, for intramuscular use
CPT	90660	Influenza virus vaccine, live, for intranasal use
CPT	90661	Influenza, inactivated cell culture vaccine, seasonal, trivalent, injectable, preservative free, for individuals >18 years of age, for intramuscular use
CPT	90662	Influenza virus vaccine, trivalent, preservative free, enhanced immunogenicity via increased antigen content, for intramuscular use
CPT	90664	Influenza virus vaccine, live (LAIV), pandemic formulation, for intranasal use
CPT	90666	Influenza virus vaccine (IIV), pandemic formulation, split virus, preservative free, for intramuscular use
CPT	90667	Influenza virus vaccine (IIV), pandemic formulation, split virus, adjuvanted, for intramuscular use
CPT	90668	Influenza virus vaccine (IIV), pandemic formulation, split virus, for intramuscular use
CPT	90672	Influenza virus vaccine, quadrivalent, live, for intranasal use
CPT	90673	Influenza virus vaccine, trivalent (RIV3), derived from recombinant DNA (RIV3), hemagglutinin (HA) protein only, preservative and antibiotic free, for intramuscular use
CPT	90685	Influenza virus vaccine, quadrivalent, preservative free, when administered to children 6-35 months of age, for intramuscular use
CPT	90686	Influenza virus vaccine, quadrivalent, preservative free, when administered to individuals 3 years and older, for intramuscular use
CPT	90687	Influenza virus vaccine, quadrivalent, when administered to children 6-35 months of age, for intramuscular use
CPT	90688	Influenza virus vaccine, quadrivalent, when administered to individuals 3 years and older, for intramuscular use
ICD-9 Procedure	99.52	Prophylactic vaccination against influenza

SUPPLEMENTARY TABLE 12: PNEUMOCOCCAL VACCINE

Presence of a claim for the following medications during the patient enrollment period:

GPI_DRUG_GROUP8_ID	DRUG
17200065	PNEUMOCOCCAL VACCINE

CPT	90669	Pneumococcal conjugate vaccine, 7 valent, for intramuscular use
CPT	90670	Pneumococcal conjugate vaccine, 13 valent, for intramuscular use
CPT	90732	Pneumococcal polysaccharide vaccine, 23-valent, adult or immunosuppressed patient dosage, when administered to individuals 2 years or older, for subcutaneous or intramuscular use

SUPPLEMENTARY TABLE 13: MODEL PARAMETERS

Parameter	Odds Ratio	95% Confidence Limits		Degrees of Freedom	Estimate	95% Confidence Limits		Standard Error	Wald Chi-square	Probability
		Lower	Upper			Lower	Upper			
Severe Exacerbations During Baseline (Count)	1.498	1.365	1.645	1	0.4045	0.311	0.4979	0.0477	71.93	<.0001
Deyo Charlson Comorbidity score	1.471	1.429	1.515	1	0.3862	0.357	0.4155	0.0149	671.4	<.0001
COPD-Related Inpatient Stays in Baseline Period (Count)	1.389	1.263	1.529	1	0.3289	0.2332	0.4246	0.0488	45.41	<.0001
Oxygen Use in Baseline Period	1.376	1.312	1.442	1	0.3191	0.2718	0.3663	0.0241	175.07	<.0001
Geographical Region - Northeast	1.312	1.049	1.643	1	0.2719	0.0474	0.4964	0.1145	5.63	0.0176
Race - White	1.207	1.040	1.401	1	0.1883	0.0394	0.3372	0.076	6.14	0.0132
Geographical Region - Midwest	1.163	1.041	1.299	1	0.1508	0.0398	0.2618	0.0567	7.09	0.0078
COPD-Related Outpatient Visit in Baseline Period	1.154	1.093	1.218	1	0.1431	0.0885	0.1976	0.0279	26.37	<.0001
COPD-Related ER Visit in Baseline Period	1.148	1.084	1.216	1	0.1381	0.0809	0.1952	0.0291	22.45	<.0001
Methylxanthine Use in Baseline Period	1.131	1.031	1.240	1	0.1229	0.0305	0.2152	0.0471	6.8	0.0091
Albuterol-Ipratropium Use in Baseline Period	1.106	1.047	1.169	1	0.101	0.0458	0.1561	0.0281	12.88	0.0003
Smoking Cessation Counseling in Baseline Period	1.062	1.012	1.114	1	0.06	0.0115	0.1084	0.0247	5.88	0.0153
Count of Systemic Corticosteroids in Baseline Period	1.036	1.019	1.053	1	0.0352	0.0187	0.0517	0.0084	17.57	<.0001
All-Cause ER Visits in Baseline Period (Count)	1.036	1.013	1.060	1	0.0357	0.0127	0.0587	0.0117	9.26	0.0023
Count of Short-Acting Beta-Agonists in Baseline Period	1.031	1.022	1.041	1	0.0309	0.0219	0.0399	0.0046	45.16	<.0001
COPD-Related Outpatient visits in Baseline Period (Count)	1.026	1.011	1.041	1	0.0256	0.0106	0.0406	0.00765	11.24	0.0008
Count of Long-Acting Beta-Agonists in Baseline Period	1.024	1.015	1.032	1	0.0234	0.0151	0.0317	0.00422	30.67	<.0001
Geographic Region - South	1.003	0.907	1.109	1	0.00294	0.0979	0.1038	0.0514	0	0.9544
All-Cause Outpatient visits in Baseline Period (Count)	0.992	0.989	0.995	1	0.00822	0.0114	0.00501	0.00164	25.21	<.0001
Coronary Artery Disease in Baseline Period	0.94	0.895	0.988	1	0.0616	0.111	0.0121	0.0252	5.96	0.0146
Race - Other	0.938	0.644	1.366	1	0.0637	0.4394	0.312	0.1917	0.11	0.7396
Congestive Heart Failure in Baseline Period	0.897	0.850	0.948	1	0.1083	0.163	0.0537	0.0279	15.09	0.0001
Obesity in Baseline Period	0.882	0.832	0.934	1	0.1258	0.1838	0.0678	0.0296	18.08	<.0001
All-Cause Inpatient visits in Baseline Period (Count)	0.876	0.810	0.947	1	0.1325	0.2102	0.0548	0.0397	11.16	0.0008
Cerebrovascular Disease in Baseline Period	0.858	0.811	0.908	1	0.1531	0.2098	0.0963	0.0289	27.98	<.0001
Race - Black	0.858	0.702	1.049	1	0.1532	0.3538	0.0474	0.1024	2.24	0.1344

Low Income Subsidy Status on Index Date	0.85	0.768	0.941	1	0.1627	0.2644	0.0611	0.0519	9.84	0.0017
Type 2 Diabetes Mellitus in Baseline Period	0.757	0.716	0.799	1	0.2789	0.3338	0.224	0.028	99.09	<.0001
Race - Hispanic	0.715	0.470	1.090	1	0.3349	0.756	0.0862	0.2148	2.43	0.1191
Chronic Kidney Disease in Baseline Period	0.695	0.653	0.739	1	0.3641	0.4265	0.3018	0.0318	130.87	<.0001
Commercial Health Plan on Index Date	0.682	0.564	0.825	1	0.3823	0.5728	0.1918	0.0972	15.47	<.0001
Intercept	0.01	0.007	0.013	1	4.6526	4.9927	4.3125	0.1735	719.04	<.0001