**Supplementary Material**

**Supplementary Table 1.** Diagnostic read codes for COPD

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| **Read code** | **Description** |
| **222I.00** | Blue bloater |
| **663K.00** | Airways obstruction irreversible |
| **66YB000** | COPD 3 monthly review |
| **66YB100** | COPD 6 monthly review |
| **66YM.00** | COPD annual review |
| **H061400** | Obliterating fibrous bronchiolitis |
| **H3...00** | COPD |
| **H3...11** | Chronic obstructive airways disease |
| **H31..00** | Chronic bronchitis |
| **H310.00** | Simple chronic bronchitis |
| **H310000** | Chronic catarrhal bronchitis |
| **H310z00** | Simple chronic bronchitis NOS |
| **H311.00** | Mucopurulent chronic bronchitis |
| **H311000** | Purulent chronic bronchitis |
| **H311100** | Fetid chronic bronchitis |
| **H311z00** | Mucopurulent chronic bronchitis NOS |
| **H312.00** | Obstructive chronic bronchitis |
| **H312100** | Emphysematous bronchitis |
| **H312300** | Bronchiolitis obliterans |
| **H312z00** | Obstructive chronic bronchitis NOS |
| **H313.00** | Mixed simple and mucopurulent chronic bronchitis |
| **H31y.00** | Other chronic bronchitis |
| **H31y100** | Chronic tracheobronchitis |
| **H31yz00** | Other chronic bronchitis NOS |
| **H31z.00** | Chronic bronchitis NOS |
| **H32..00** | Emphysema |
| **H320.00** | Chronic bullous emphysema |
| **H320000** | Segmental bullous emphysema |
| **H320100** | Zonal bullous emphysema |
| **H320200** | Giant bullous emphysema |
| **H320300** | Bullous emphysema with collapse |
| **H320z00** | Chronic bullous emphysema NOS |
| **H321.00** | Panlobular emphysema |
| **H322.00** | Centrilobular emphysema |
| **H32y.00** | Other emphysema |
| **H32y000** | Acute vesicular emphysema |
| **H32y100** | Atrophic (senile) emphysema |
| **H32y111** | Acute interstitial emphysema |
| **H32y200** | MacLeod's unilateral emphysema |
| **H32yz00** | Other emphysema NOS |
| **H32z.00** | Emphysema NOS |
| **H36..00** | Mild COPD |
| **H37..00** | Moderate COPD |
| **H38..00** | Severe COPD |
| **H39..00** | Very severe COPD |
| **H3A..00** | End stage chronic obstructive airways disease |
| **H3y..00** | Other specified chronic obstructive airways disease |
| **H3y..11** | Other specified COPD |
| **H3z..00** | Chronic obstructive airways disease NOS |
| **H3z..11** | COPD NOS |
| **H464000** | Chronic emphysema due to chemical fumes |
| **H464100** | Obliterative bronchiolitis due to chemical fumes |
| **H564.00** | Bronchiolitis obliterans organizing pneumonia |
| **H564.11** | Cryptogenic organizing pneumonia |
| **H581.00** | Interstitial emphysema |
| **H582.00** | Compensatory emphysema |
| **H583200** | Eosinophilic bronchitis |
| **Hyu3000** | [X]Other emphysema |
| **Hyu3100** | [X]Other specified chronic obstructive pulmonary disease |
| **663k.00** | Reversibility trial by steroids |
| **66Ym.00** | Inhaler device in use |
| **H310100** | Smokers' cough |
| **H312000** | Chronic asthmatic bronchitis |
| **H312011** | Chronic wheezy bronchitis |
| **H312200** | Acute exacerbation of chronic obstructive airways disease |
| **H31y000** | Chronic tracheitis |
| **H320311** | Tension pneumatocoele |
| **H3y0.00** | COPD with acute lower respiratory infection |
| **H3y1.00** | COPD with acute exacerbation, unspecified |
| **H440.00** | Byssinosis |
| **H464.00** | Chronic respiratory conditions due to chemical fumes |
| **H464200** | Chronic pulmonary fibrosis due to chemical fumes |
| **H464z00** | Chronic respiratory conditions due to chemical fumes NOS |
| **H581.11** | Pneumomediastinum |
| **Hyu3.00** | [X]Chronic lower respiratory diseases |

**Abbreviations:** COPD, chronic obstructive pulmonary disease; NOS, not otherwise specified.

**Supplementary Table 2.** Read codes for exclusion of COPD

|  |  |
| --- | --- |
| **Read code** | **Description** |
| **14S9.00** | H/O: lung recipient |
| **23E5.00** | O/E - fibrosis of lung present |
| **23E5.11** | O/E - fibrosis of lung |
| **7448100** | Excision of cyst of bronchus |
| **7450.00** | Transplantation of lung |
| **7450000** | Double lung transplant |
| **7450100** | Single lung transplant |
| **7450y00** | Other specified transplantation of lung |
| **7450z00** | Transplantation of lung NOS |
| **7451.00** | Excision of lung |
| **7451.11** | Pneumonectomy operations |
| **7451000** | Total pneumonectomy |
| **7451011** | Pneumonectomy |
| **7451100** | Bilobectomy of lung |
| **7451200** | Lobectomy of lung |
| **7451211** | Pulmonary lobectomy |
| **7451300** | Excision of segment of lung |
| **7451311** | Pulmonary segmentectomy |
| **7451400** | Partial lobectomy of lung NEC |
| **7451y00** | Other specified excision of lung |
| **7451z00** | Excision of lung NOS |
| **7900.00** | Transplantation of heart and lung |
| **7900000** | Allotransplantation of heart and lung |
| **7900z00** | Transplantation of heart and lung NOS |
| **A114.00** | Tuberculous fibrosis of lung |
| **A115.00** | Tuberculous bronchiectasis |
| **C10N100** | Cystic fibrosis related diabetes mellitus |
| **C350300** | Idiopathic pulmonary hemosiderosis |
| **C370.00** | Cystic fibrosis |
| **C370.12** | Mucoviscidosis |
| **C370000** | Cystic fibrosis with no meconium ileus |
| **C370100** | Cystic fibrosis with meconium ileus |
| **C370111** | Meconium ileus in cystic fibrosis |
| **C370200** | Cystic fibrosis with pulmonary manifestations |
| **C370300** | Cystic fibrosis with intestinal manifestations |
| **C370400** | Arthropathy in cystic fibrosis |
| **C370500** | Cystic fibrosis with distal intestinal obstruction syndrome |
| **C370800** | Cystic fibrosis related cirrhosis |
| **C370y00** | Cystic fibrosis with other manifestations |
| **C370z00** | Cystic fibrosis NOS |
| **H34..00** | Bronchiectasis |
| **H340.00** | Recurrent bronchiectasis |
| **H341.00** | Post-infective bronchiectasis |
| **H34z.00** | Bronchiectasis NOS |
| **H423.00** | Massive silicotic fibrosis |
| **H431.00** | Bauxite fibrosis of lung |
| **H433.00** | Graphite fibrosis of lung |
| **H464200** | Chronic pulmonary fibrosis due to chemical fumes |
| **H48..00** | Progressive massive fibrosis |
| **H4y1.00** | Chronic pulmonary radiation disease |
| **H4y1000** | Chronic pulmonary fibrosis following radiation |
| **H4y1z00** | Chronic pulmonary radiation disease NOS |
| **H4y2.00** | Drug-induced interstitial lung disorders |
| **H4y2000** | Acute drug-induced interstitial lung disorders |
| **H4y2100** | Chronic drug-induced interstitial lung disorders |
| **H55..00** | Postinflammatory pulmonary fibrosis |
| **H561.00** | Idiopathic pulmonary hemosiderosis |
| **H563100** | Diffuse pulmonary fibrosis |
| **H58y300** | Interstitial lung disease NEC |
| **H58y500** | Respiratory bronchiolitis associated interstitial lung dis |
| **H58y700** | Interstitial lung disease due to connective tissue disease |
| **Hyu5000** | [X]Other interstitial pulmonary diseases with fibrosis |
| **P84..00** | Congenital cystic lung |
| **P840.00** | Congenital cystic lung disease, unspecified |
| **P841.00** | Congenital polycystic lung |
| **P841.11** | Multiple lung cysts |
| **P841.12** | Multiple congenital bronchogenic cysts |
| **P842.00** | Congenital honeycomb lung |
| **P843.00** | Single lung cyst |
| **P843.11** | Lung cyst |
| **P843.12** | Congenital bronchogenic cyst |
| **P844.00** | Congenital cystic adenomatoid malformation of the lung |
| **P84y.00** | Other specified congenital cystic lung |
| **P84z.00** | Congenital cystic lung NOS |
| **P85..00** | Lung agenesis, hypoplasia and dysplasia |
| **P850.00** | Aplasia of lung |
| **P853.00** | Agenesis of lung |
| **P853.11** | Congenital absence of lung |
| **P853000** | Congenital absence of lung fissures |
| **P853100** | Congenital absence of lobe of lung |
| **P853z00** | Agenesis of lung NOS |
| **P85y.00** | Other specified lung agenesis, hypoplasia or dysplasia |
| **P85yz00** | Other lung agenesis, hypoplasia or dysplasia NOS |
| **P85z.00** | Lung agenesis, hypoplasia or dysplasia NOS |
| **P861.00** | Congenital bronchiectasis |
| **Q317100** | Prematurity with interstitial pulmonary fibrosis |
| **ZV42600** | [V]Lung transplanted |
| **ZV6G200** | [V]Acquired absence of part of lung |
| **7451500** | Reduction of lung volume |
| **C370.11** | Fibrocystic disease |
| **H43..00** | Pneumoconiosis due to other inorganic dust |
| **H432.00** | Berylliosis |
| **H434.00** | Siderosis |
| **H435.00** | Stannosis |
| **H43z.00** | Pneumoconiosis due to inorganic dust NOS |
| **P731.00** | Pulmonary artery agenesis |
| **P731.11** | Congenital absence of pulmonary artery |
| **P851.00** | Hypoplasia of lung |
| **P852.00** | Sequestration of lung |
| **P85y000** | Fusion of lobes of lung |

**Abbreviations:** COPD, chronic obstructive pulmonary disease; NES, not elsewhere classified; NOS, not otherwise specified.

**Supplementary Table 3.** Diagnostic read codes for COPD exacerbation

|  |  |
| --- | --- |
| **Read code** | **Description** |
| ***Moderate exacerbations*** |
| **H312200** | Acute exacerbation of chronic obstructive airways disease |
| **H3y1.00** | COPD with acute exacerbation, unspecified |
| **8BP8.00** | Antibiotic therapy for acute pulmonary exacerbation |
| **H3y0.00** | COPD with acute lower respiratory infection |
| ***Severe exacerbations*** |
| **8H2R.00** | Admit COPD emergency |
| **66Ye.00** | Emergency COPD admission since last appointment |
| **66Yd.00** | COPD accident and emergency attendance since last visit |
| **66Yi.00** | Multiple COPD emergency hospital admissions |

**Abbreviations:** COPD, chronic obstructive pulmonary disease.

**Supplementary Figure 1.** Diagram showing definition of continuous use of index treatment.



**Abbreviations:** LABD, long-acting bronchodilator.

**Supplementary Figure 2.** Diagrams showing definitions of first treatment modifications, which were categorized as either augmentation (A); direct switch (B); retreatment (C); or discontinuation/step down (D).



**Abbreviations:** LABD, long-acting bronchodilator.