

Study protocol

# Effectiveness of triple therapy vs. dual bronchodilation in COPD

*Historical cohort study comparing effectiveness of triple therapy against dual bronchodilation in patients with chronic obstructive pulmonary disease (COPD)*

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## 1.0 Background

Chronic obstructive pulmonary disease (COPD) is characterized by persistent and progressive airflow limitation.<sup>1</sup> The principle aims of treatment are to manage symptoms, reduce future (exacerbation) risk and to slow disease progression.

Long-acting bronchodilators (both muscarinic antagonists [LAMAs] and long-acting  $\beta$ 2-agonists [LABAs]) are the mainstay of therapeutic management in COPD and, owing to their differing modes of action, their combined use can result in greater bronchodilation than is possible by use of either therapy alone.<sup>2-5</sup> As COPD is primarily characterized by neutrophilic inflammation, the use of inhaled corticosteroids (ICS) therapy—which more effectively targets eosinophilic inflammation—is only recommended in combination with bronchodilators and for more targeted use, e.g. in the subset of COPD patients suspected of having a mixed asthma-COPD phenotype.<sup>1</sup> In clinical practice, however, ICS therapy is more widely used and often prescribed in a combination inhaler with LABA (i.e. fixed dose combination [FDC] ICS/LABA).<sup>6</sup> Randomized controlled trials [RCTs] involving patients with moderate-to-severe COPD, suggest combination ICS/LABA can provide greater symptom control, pulmonary function improvement, and exacerbation reduction than either drug alone.<sup>7-9</sup>

In patients managed on ICS/LABA, addition of a LAMA may offer greater bronchodilation and, in those on bronchodilator therapy (e.g. LAMA or combined LAMA/LABA) there may be benefit in the addition of ICS therapy (with a LABA in patients previously on LAMA alone), particularly in patients more responsive to ICS treatment.

The comparative efficacy of triple therapy has been explored in a number of Randomised Controlled Trials [RCTs], particularly for comparison with ICS/LABA. For example, the TRILOGY study provided evidence for clinical benefits of stepping up patients with severe or very severe COPD from extrafine beclometasone/formoterol combination treatment to triple therapy with glycopyrronium (a LAMA) added in a single inhaler.<sup>10</sup> Triple therapy was found to reduce exacerbation rate, improve lung function and reduce breathlessness over 52 weeks. The FULFIL study compared once-daily fluticasone furoate/umeclidinium/vilanterol with twice-daily budesonide/formoterol and found improvement in lung function, quality of life and exacerbation over 24 weeks.<sup>11</sup>

There is less evidence about the effectiveness of triple therapy over monotherapy with LAMA, or dual bronchodilation with LAMA/LABA. Further, in terms of the comparison of triple therapy with ICS/LABA, it is unclear whether potential improvement of effectiveness is different when using extrafine versus fine-particle ICS. Extrafine particle ICS supposedly have greater deposition in small airways and have been shown to be associated with better asthma outcomes when compared to fine-particle ICS.<sup>12</sup>

### RCTs of Triple therapy versus LAMA monotherapy

A systematic review study found six studies (1902 participants) with low risk of bias that compared tiotropium (a LAMA) in addition to inhaled corticosteroids and long-acting  $\beta$ 2-agonist combination therapy versus tiotropium alone.<sup>13</sup> This study found a reduction in all-cause hospitalisations with the use of triple therapy (tiotropium + ICS/LABA). The effect on exacerbations was heterogeneous among trials and was not meta-analysed. Health-related quality of life and lung function showed statistically significant improvement with triple therapy.

The recently published TRINITY study compared treatment with fixed extrafine beclometasone/ formoterol/ glycopyrronium to tiotropium and found reduction of moderate and severe exacerbations and improved lung function in patients with severe or very severe COPD over 52 weeks.<sup>14</sup> Furthermore, effects of fixed triple therapy and open triple were found to be similar.

### RCTs of Triple therapy versus LAMA/LABA dual bronchodilation therapy

Reports on results from RCTs comparing triple therapy (fluticasone/salmeterol/tiotropium) with LAMA/LABA dual bronchodilation therapy are limited. A recent systematic review searched for studies which assessed the effect of adding ICS to combination treatment with LAMA/LABA, in patients with stable COPD.<sup>15</sup> No studies were found that investigated this treatment effect. The WISDOM trial was considered potentially relevant, but was excluded from the review as it did not include a direct comparison of triple versus LAMA/LABA therapy. Rather, it compared patients receiving triple therapy with patients initially receiving triple therapy, with ICS withdrawn over a 12-week period. It found that patients with severe or very severe COPD had similar exacerbation risks regardless of whether ICS were withdrawn or continued over 12 weeks.<sup>16</sup> However, there was a greater decrease in lung function during the final step of ICS withdrawal.

### Observational studies of triple therapy

The external validity of RCTs and the ability to represent treatment outcomes in real-world clinical practice remains equivocal.<sup>17</sup> A systematic study applying RCT selection criteria to a large representative population of patients with COPD (OPCRD) found a median eligibility of 23% (interquartile range 12-38). It is for this reason that systematic reviews of the literature have called for representative, longer-term studies to determine the potential benefits of triple versus dual combination therapy in COPD.<sup>18,19</sup>

As with the body of RCT evidence on triple therapy, comparative effectiveness studies using observational methods have also produced inconsistent evidence for triple therapy.

Several retrospective studies showed a null difference when comparing triple therapy to single LAMA therapy or dual therapy with ICS/LABA. Kim et al compared both dual versus triple and mono versus triple comparator arms, using a step-down, withdrawal design.<sup>20</sup> Patients receiving triple therapy over 2 years (n=109) were compared with those who had received triple therapy for at least 1 year and subsequently stepped down to ICS/LABA or LAMA therapy as a result of inhaler withdrawal (either LAMA or ICS/LABA; n=39). Step-down resulted in aggravating disease symptoms, a reduced overall quality of life, decreasing exercise performance, and accelerated FEV<sub>1</sub> decline, but no apparent increase in exacerbation frequency. Roberts et al. used administrative claims data to assess observational methods when comparing exacerbation risk between triple therapy and other therapy options.<sup>21</sup> In 2 of its 3 assessed designs, there was no difference in risk between triple therapy and the other treatments.

Benefit of triple therapy has been demonstrated in other observational studies. Chatterjee et al compared the exacerbation risk and COPD-related healthcare costs in patients initiating LAMA (tiotropium) alone or in combination with fixed dose combination ICS/LABA. Triple therapy was associated with significant reductions in the risk of moderate (and any) exacerbations at 1 year, compared with LAMA alone (at no overall additional cost).<sup>22</sup> The OUTPUL study used administrative data in Italy to compare cohorts of COPD patients (total N=5,717) receiving ICS/LABA or triple therapy, over one year.<sup>23</sup> In its primary analysis, the study found no difference in risk of exacerbation between patients receiving ICS/LABA and triple therapy. However, in a subgroup analysis consisting of patients who had previous exacerbations, patients receiving triple therapy had a reduced risk of moderate exacerbations compared to ICS/LABA (hazard ratio 0.68, 95% CI, 0.48-0.98).

Finally, a large US study based on questionnaire data found that patients using triple therapy at the time of entry to the study experienced more exacerbations than 5 other treatment combinations over the 12-month period prior to the study.<sup>24</sup> However, this study is limited by relying on patient recall of exacerbations over the study period, and by not taking into account the proportion of this period that the patient had been on their current therapy.

Additional real-world studies of representative populations receiving routine clinical management are required to strengthen the body of evidence for the effectiveness of triple therapy versus other therapies, particularly studies comparing triple therapy with dual bronchodilation. Beyond this, it would be highly useful to investigate treatment delivery



options within triple therapy, so that primary care management could be optimised for this treatment strategy.

#### Refining triple therapy: in terms of treatment delivery and strategy

As well as building on current evidence of the effectiveness of triple therapy compared to other combinations in general, more information is needed concerning the surrounding factors that may influence its effectiveness. Firstly, the delivery of treatment may be considered. This could include the types of device being used by the patient, for example, devices with superior design features, or the use of a multiple devices with varying or similar inhalation technique. Factors of treatment delivery may also include: dose frequency of the treatment (i.e. once/twice a day); and whether the medication has fine or extra-fine particle size.

Many of these factors have been explored within one treatment combination, or in other conditions such as asthma. In asthma, extra-fine particle ICS has been shown to be associated with better outcomes than fine particle ICS.<sup>25</sup> Dose frequency can influence adherence to therapy, in turn influencing effectiveness. For example, a real-life study in the US demonstrated better treatment adherence and lower healthcare utilization in COPD patients receiving a once-daily dose, compared to other daily frequencies.<sup>26</sup>

It is of interest to investigate these factors within the context of the comparison between triple therapy and other combinations, in order to better inform future treatment strategies.

## 1.1 Study aims

The real-world evidence for the use of triple therapy in patients with COPD compared with other treatment combinations recommended by guidelines, remains limited.

The proposed study aims to address the following:

Test the real-world effectiveness among COPD treatment regimens and, in so doing, test the external validity of the evidence derived from triple therapy efficacy RCTs; and

Explore differential responses to triple therapy across patient subgroups to identify opportunities for optimal use of triple therapy.

## 1.2 Study objectives

The primary objective is to examine whether the effectiveness, in terms of reducing COPD-related exacerbations, of triple therapy is superior to that of dual bronchodilation (LAMA/LABA) in patients with COPD. The secondary objective will be to study the potential heterogeneity of the effectiveness driven by patient's and therapy characteristics. The tertiary objective will be to establish the effectiveness of triple therapy on reducing long-term lung function decline.

## 2.0 Study design

### 2.1 Study design

The study will have two parallel designs, comparing patients initiated on treatment with triple therapy with patients receiving dual bronchodilation with LAMA/LABA (Figure 1). The designs differ in the therapy prescribed in the baseline year:

1. Patients receiving LAMA/LABA at baseline who step up to triple therapy will be compared with patients on stable LAMA/LABA therapy during the outcome period
2. Patients on LAMA monotherapy at baseline who step up to triple therapy will be compared with patients who step up to LAMA/LABA dual therapy during the outcome period.

The date of step up to triple therapy will be the index date (ID) in the active study arm and the dates of a matched repeat prescription of LAMA/LABA (substudy 1) or step up to dual bronchodilation (substudy 2) will be the IDs in the control arms. A patient may have multiple index dates eligible for inclusion in a study arm, but only one of these will be selected.

**Index date:**

Triple therapy arm – first (add-on) ICS [1] or ICS/LABA prescription [2]

Dual therapy arm – repeat LAMA/LABA [1] or first (add-on) LABA prescription [2]

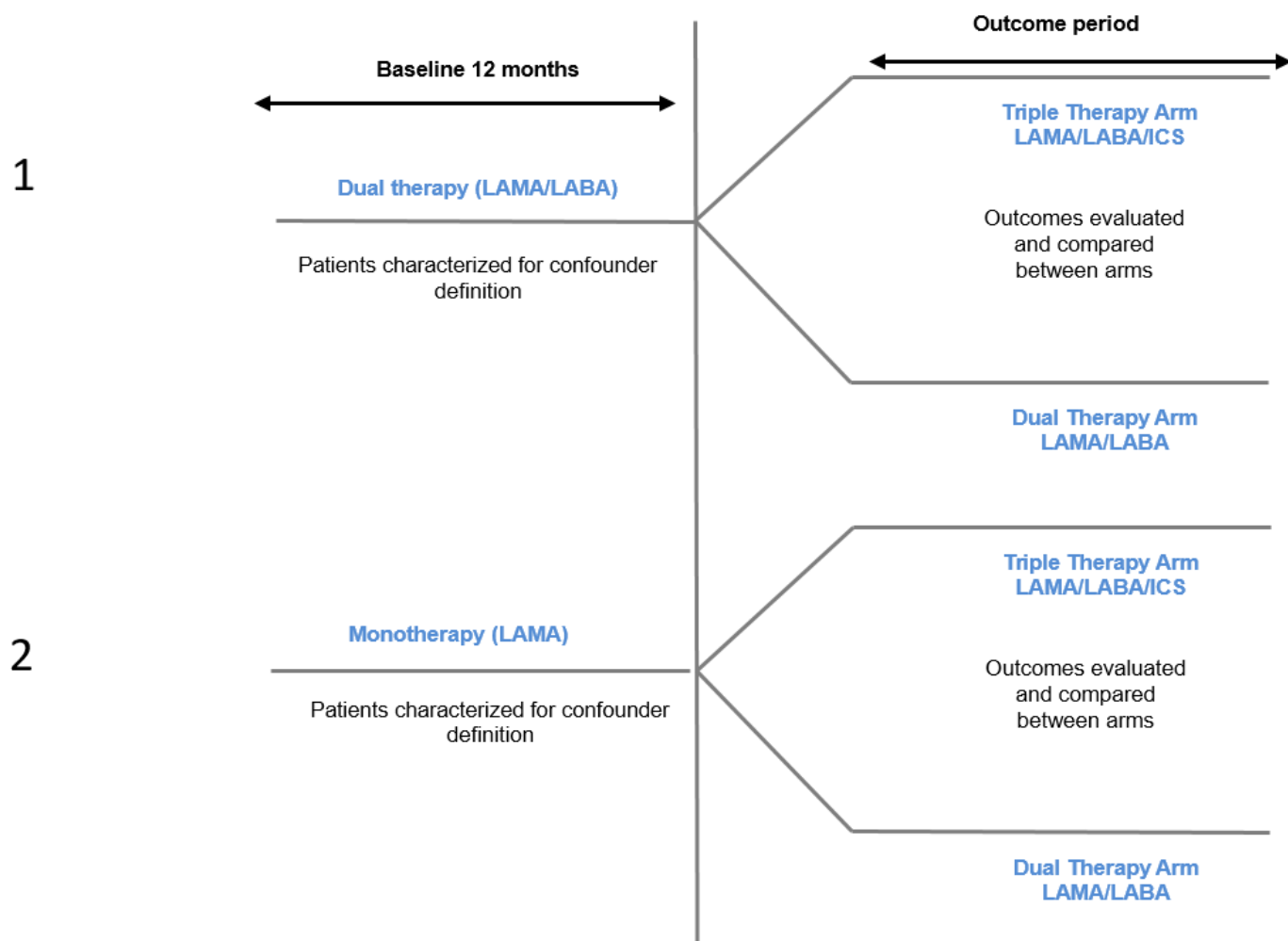


Figure 1. Study design

## 3.0 Study population

### 3.1 Inclusion and exclusion criteria

The overall inclusion and exclusion criteria are listed in Table 1. For some of the secondary end points, additional inclusion criteria are required, which are listed in Table 2.

*Table 1 Overall inclusion and exclusion criteria*

Inclusion criteria
1. Diagnostic Read code for COPD (Appendix <b>Fout! Verwijzingsbron niet</b>
2. $\geq 1$ FEV <sub>1</sub> /FVC ratio $< 0.70$ recorded ever
3. Age $\geq 40$ years
4. Ex-smoker or current smoker at recording closest to ID
5. $\geq 1$ year of continuous practice data prior to ID (baseline year)
6. $\geq 1$ year of continuous practice data after ID (outcome year)
7. Active therapy during baseline year and outcome period (see paragraph 4.1)

Exclusion criteria
1. Active asthma at or after index date, defined as $\geq 1$ diagnostic Read code for asthma or $\geq 1$ asthma monitoring or review Read code recorded (Appendix <b>Fout! Verwijzingsbron niet gevonden.</b> )
2. CPRD medcode (109958) or OPCRD Read code (H3B.. or Xac33) for Asthma-COPD overlap syndrome as COPD diagnostic code
3. Diagnostic code for other chronic lower respiratory conditions recorded ever (Appendix <b>Fout! Verwijzingsbron niet gevonden.</b> )

*Table 2. End point specific inclusion criteria*

End point specific inclusion criteria
1. Modified Medical Research Council Score (mMRC): available within 18 months after ID
2. FEV <sub>1</sub> decline (Objective 3): FEV <sub>1</sub> measurement recorded in baseline year and $\geq 2$ repeated measurements under treatment studied in outcome period after ID
3. Hospitalisation with COPD as primary diagnosis: Hospital Episodes Statistics (HES) linkage to CPRD data
4. A&E attendance with COPD as primary diagnosis: HES A&E data available



### 3.2 Data source

All objectives of the study will use electronic medical records from two sources: Optimum Patient Care Research Database (OPCRD) and Clinical Practice Research Datalink (CPRD).

The OPCRD comprises data extracted through the Optimum Patient Care (OPC) Clinical Service Evaluation. The clinical review involves a combined review of (anonymised) electronic medical records (EMRs) and patients' responses to disease-specific questionnaires and characterizes patients in terms of their demography, disease control and exacerbation history. The review process produces patient-level reports that offer guideline-based recommendations for possible management changes to optimise control at the lowest possible therapeutic dose and reduce potential future exacerbation risk.

At the time of writing, OPCRD contains anonymised, research-quality data for approximately 3.4 million of patients from more than 600 practices across the UK that subscribe to the OPC Clinical Service Evaluation (see Appendix 1 for OPCRD Data Dictionary). Within the database, there is EMR data available for approximately 208,000 COPD patients, of whom a subgroup also has linked COPD questionnaire data.

The CPRD is a large computerized primary care database, which contains de-identified, longitudinal data from 5 million active medical records from more than 600 subscribing practices throughout the UK. A practice-based quality marker, the "up-to-standard date", is generated by the CPRD for each subscribing practice and data subsequent to the practice up-to-standard date are considered to be acceptable, research quality, prospectively recorded data. The CPRD is well-validated and used frequently for medical and health research.

Analyses for objective 1 will be performed using data from OPCRD only, as the need for rapid delivery of the analysis on Objective 1 precludes the use of CPRD.

For objective 2, OPCRD data will be combined with CPRD data.

Hospital Episode Statistics (HES), linked to CPRD and OPCRD will be required to identify hospital-related events. Death Registration data from the Office for National Statistics (ONS), linked to the data will be required to identify COPD-related death.

The OPCRD and CPRD datasets will be constructed separately and checked for overlap, before pooling for analyses, in order to exclude patients with duplicate data. Identification of patients who are present in both OPCRD and CPRD datasets will be conducted by matching

on a number of variables, such as the year of birth, gender and index date. Patients will never become identifiable during this procedure. From pooling of data from these two databases for previous studies conducted by our team we observed between 2-4% overlap.

## 4.0 Study variables and study outcomes

### 4.1 Definition of therapy groups

Any combination of devices and fixed dose combination or separate inhalers will be permitted. If prescriptions are for fixed combinations, they will be considered as 2 separate prescriptions (one for class LABA and one for class ICS) starting and ending on the same date.

For therapy present at baseline and outcome period, active therapy is defined as  $\geq 2$  prescriptions within 120 days prior to and after ID (with prescriptions at ID included in both periods). For therapy initiated at ID, there should be no prescriptions within 120 days prior to ID and  $\geq 1$  repeat prescription within 120 days after ID.

### 4.2 Demographics and baseline variables

#### Demographics

1. Age group at index date (years):
2. Sex
3. Smoking status, Read code closest to ID
  - a. Ex-smoker
  - b. Current smoker
4. BMI, calculated from height and weight data if available<sup>1</sup> and taken from practice recorded BMI value if not, within 10 years prior to index date
  - a. Underweight:  $<18.5$
  - b. Normal weight:  $\geq 18.5$  and  $<25$
  - c. Overweight:  $\geq 25$  and  $<30$
  - d. Obese:  $\geq 30$

#### Comorbidities

5. Comorbidities:
  - a. Asthma ever (Diagnostic Read code prior to ID)

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<sup>1</sup> Weight (kg) divided by height (metres) squared

- b. Allergic / non-allergic rhinitis
    - a. Never
    - b. Active, defined as diagnosis or drug prescription in baseline year
    - c. Ever, not active
  - c. Eczema diagnosis
    - a. Never
    - b. Active, defined as diagnosis in baseline year
    - c. Ever, not active
  - d. Nasal polyps (Diagnostic Read code ever)
  - e. Sinusitis (Diagnostic Read code ever)
  - f. Pneumonia (Diagnostic Read code ever)
  - g. Gastro-oesophageal reflux disease (GERD) (Diagnostic Read code)
    - a. Active, defined as diagnosis in baseline year
    - b. Ever
  - h. Diabetes Mellitus (Diagnostic Read code or  $\geq 1$  anti-diabetic medication prescription<sup>2</sup> ever)
  - i. Hypertension (Diagnostic Read code ever)
  - j. Obstructive Sleep apnoea (Diagnostic Read code ever)
  - k. Sleep disorders (Diagnostic Read code ever)
  - l. Glaucoma (Diagnostic Read code ever or treatment for glaucoma)
  - m. Cataract (Diagnostic Read code ever or Read code for surgery)
  - n. Ischaemic heart disease
  - o. Heart failure ever (Diagnostic Read code ever)
  - p. Psychiatric conditions / Anxiety/ Depression (Diagnostic Read code ever)
  - q. Chronic kidney disease ever (Diagnostic Read code ever)
  - r. Osteoporosis (Diagnostic Read code ever)
6. Charlson co-morbidity index<sup>27</sup>: based on diagnoses ever
- a. 1-4
  - b. 5-9
  - c.  $\geq 10$

### Clinical characteristics

1. Modified Medical Research Council (mMRC) dyspnoea score, most recent score within 5 years prior to the index date (see Appendix 12.20):

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<sup>2</sup> Polycystic Ovarian Syndrome treatment with metformin excluded



- a. 0-1
  - b.  $\geq 2$
  - c. Unknown
2. Degree of airflow limitation, FEV<sub>1</sub>% predicted, mean (SD) and categorical:
- a. Mild: FEV<sub>1</sub>% predicted  $\geq 80\%$
  - b. Moderate: FEV<sub>1</sub>% predicted 50–79%
  - c. Severe: FEV<sub>1</sub>% predicted 30–49%
  - d. Very severe: FEV<sub>1</sub>% predicted  $< 30\%$

The formula used to predict FEV<sub>1</sub> will be<sup>28</sup>:

For Males: Predicted FEV<sub>1</sub> = (4.30 x height (m)) – (0.029 x age - 2.49)

For Females: Predicted FEV<sub>1</sub> = (3.95 x height (m)) – (0.025 x age - 2.60)

3. GOLD groups, defined based on a combined assessment of degree of dyspnoea (mMRC closest to index date within 5 years) and the number of exacerbations in the baseline year following 2017 GOLD recommendations:
- a. GOLD A:  $\leq 1$  COPD exacerbation<sup>3</sup> and no hospitalization for COPD in baseline year and mMRC 0–1
  - b. GOLD B:  $\leq 1$  COPD exacerbation and no hospitalization for COPD in baseline year and mMRC  $\geq 2$
  - c. GOLD C:  $\geq 2$  COPD exacerbations or  $\geq 1$  hospitalization for COPD in baseline year) and mMRC 0–1
  - d. GOLD D:  $\geq 2$  COPD exacerbations or  $\geq 1$  hospitalization for COPD in baseline year) and mMRC  $\geq 2$
  - e. Unknown
4. Number of COPD exacerbations in the baseline year
5. Cumulative daily dose<sup>4</sup> of oral corticosteroids prescribed in baseline year, categorised as; none,  $< 2.5$ ,  $\geq 2.5$  and  $< 5$ ,  $\geq 5$  and  $< 7.5$ , and  $\geq 7.5$  mg
6. Cumulative daily doses of SABA prescribed in baseline year, grouped as; none, 1-100, 101-200, 201-300, 301-400, and  $> 400$  mcg/day, salbutamol equivalent

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<sup>3</sup> COPD exacerbation, as the occurrence of one or more of the following events:

- a. Respiratory-related hospital attendance / admission AND/OR
- b. Respiratory-related A&E attendance AND/OR
- c. An acute oral corticosteroid course AND/OR
- d. Antibiotics prescribed with evidence of a lower respiratory consultation

<sup>4</sup> the cumulative dose prescribed over the baseline year expressed as average dose per day, calculated as: (number of inhalers prescribed in baseline year \* doses in pack) / 365) \* mcg strength)

7. Cumulative daily dose of SAMA prescribed in baseline year, grouped as; none, 1-20, 21-40, 41-60, 61-80, and >80 mcg/day, ipratropium equivalent

### 4.3 Potential effect modifiers of effectiveness (objective 2)

Objective 2 uses the same design as objective 1, i.e. same patient groups, except for the study on effect modification by triple therapy characteristics, which will be performed within patients on triple therapy only. The analysis will investigate whether the effect of triple versus LAMA/LABA therapy varies depending on various factors relating to delivery of treatment and patient's severity of disease. The following characteristics will be studied:

1. Characteristics of triple therapy:
  - a. Device type: Mixed versus similar of dry-powder inhalers (DPI) and metered-dose inhalers (MDI)
  - b. Number of devices, 2 versus 3 devices
  - c. Dose frequency, twice a day with at least one inhaler versus once a day
  - d. ICS characteristics:
    - i. Particle size, extra-fine particle versus fine particle size
    - ii. ICS substance, 3 categories: fluticasone, beclometasone or budesonide
2. Baseline disease severity:
  - a. Baseline history of exacerbations (0, 1 or  $\geq 2$  exacerbations)
  - b. Degree of airflow limitation:
    - i. Mild: FEV<sub>1</sub>% predicted  $\geq 80\%$
    - ii. Moderate: FEV<sub>1</sub>% predicted 50–79%
    - iii. Severe: FEV<sub>1</sub>% predicted 30–49%
    - iv. Very severe: FEV<sub>1</sub>% predicted  $< 30\%$
  - a. COPD GOLD groups defined based on a combined assessment of degree of dyspnoea (mMRC closest to index date within 5 years) and the number of exacerbations:
    - i. GOLD A:  $\leq 1$  COPD exacerbation and no hospitalization for COPD in baseline year and mMRC 0–1
    - ii. GOLD B:  $\leq 1$  COPD exacerbation and no hospitalization for COPD in baseline year and mMRC  $\geq 2$
    - iii. GOLD C:  $\geq 2$  COPD exacerbations or  $\geq 1$  hospitalization for COPD in baseline year) and mMRC 0–1

- iv. GOLD D:  $\geq 2$  COPD exacerbations or  $\geq 1$  hospitalization for COPD in baseline year) and mMRC  $\geq 2$
- b. Total number of therapies (including those for co-morbidities): number of unique drugs prescribed in the baseline year, except those for COPD therapy.

#### 4.4 Primary outcome objectives 1 and 2

The primary end points of objective 1 will be:

- A. The number of COPD exacerbations in the first year of follow-up after ID, defined as:
  1. Respiratory-related hospital attendance / admission
  2. Respiratory-related A&E attendance
  3. An acute oral corticosteroid course prescription
  4. Antibiotics prescribed with evidence of a lower respiratory consultation at the same day
- B. Time to the first COPD exacerbation, with censoring at loss to follow-up or death.

#### 4.5 Primary outcome objective 3

The primary end point of objective 3 will be the average change (decline) in FEV<sub>1</sub> expressed as millilitres per year over the follow-up period after ID.

#### 4.6 Secondary outcomes objectives 1 and 2

The following secondary outcomes will be analysed for objectives 1 and 2:

1. Disaggregated components of exacerbations (number in first outcome year and time to first event), i.e.:
  - a. Acute courses of oral corticosteroids
  - b. Antibiotic prescriptions with evidence of lower respiratory consultation
2. mMRC score within 18 months after index date ( $\geq 2$  vs.  $< 2$ )
3. Time to first pneumonia diagnosis: chest X-rays and/or a diagnostic code (Appendix **Fout! Verwijzingsbron niet gevonden.**)

#### 4.7 Explorative outcomes objective 1 and 2

Explorative analyses will be performed for the following outcomes with limited data available:

1. Time to first hospitalisation with COPD as primary diagnosis in patients from CPRD with HES data available

2. Time to first A&E attendance with COPD as primary diagnosis in patients from CPRD with HES data available

## 5.0 Statistical analysis

### 5.1 Baseline characterisation

Summary statistics are provided for all variables, for the complete dataset and by patients comparison groups. For continuous variables, these include:

- Sample size (n)
- Percentage non-missing
- Mean  $\pm$  Standard Deviation for normally distributed variables
- Median and Inter-quartile Range (25th and 75th percentiles) for non-normally distributed variables

For number of events per year, the summary statistics include:

- Sample size (n)
- Count and Percentage by category (distribution): 0, 1, 2, 3 and  $\geq 4$

For other categorical variables, the summary statistics include:

- Sample size (n)
- Count and Percentage by category (distribution)

Characteristics are compared using the chi-squared test for categorical variables and a Student's t-test for normally distributed continuous variables or a Mann-Whitney test for non-normally distributed continuous variables.

### 5.2 Matching

Potential confounders of the association between therapy arm and the primary outcome are identified based on a combination of baseline imbalance, bias potential and expert judgement, and the optimal confounding limitation approach will be selected. Direct matching is preferred, but if it is not feasible it will be combined with a propensity score based approach.

Residual confounding will be identified, and the confounders will be used for direct adjustment in the outcome analyses. This is repeated for each outcome.

If matching will be used to limit confounding, the presence of HES statistics will be considered as an additional condition used in the matching, in order to be able to perform the analyses on the outcomes for which HES data are required within the same study populations, if numbers of patients that can be matched are not substantially reduced. Too

much restriction of the study population due to matching will reduce the external validity of the results as well as the statistical power to detect a difference between study arms. For the identification of confounders the following statistics are used: baseline balance and bias potential.

### Baseline balance

A characterisation of all baseline demographic, co-morbidity, indicators of disease severity and other patient characteristic variables will be carried out and presented for each arm. The difference between the arms will be quantified using the Standardized Mean Difference (SMD).<sup>29</sup> This measure is not affected by the number of observations, and thus a better way to judge imbalance than a p-value of a hypothesis test of difference. The SMD will be calculated for both continuous and categorical variables as described in Table 3. An SMD ≤ 10% indicates sufficient balance between the treatment and the reference (control) group.

Table 3. Formulae for Standardised Mean Difference

Covariate type	Formula
Continuous	$SMD = 100 * \frac{(\bar{x}_t - \bar{x}_r)}{\sqrt{\frac{s_t^2 + s_r^2}{2}}}$ <p>where <math>\bar{x}_t, \bar{x}_r</math> denote the sample means and <math>s_t, s_r</math> the standard deviations</p>
Binary	$SMD = 100 * \frac{(\hat{p}_t - \hat{p}_r)}{\sqrt{\frac{\hat{p}_t(1-\hat{p}_t) + \hat{p}_r(1-\hat{p}_r)}{2}}}$ <p>where <math>\hat{p}_t, \hat{p}_r</math> denote the proportion of patients in each category</p>
Categorical (>2 categories)	$SMD = 100 * \sqrt{(T - C)'S^{-1}(T - C)}$ <p>where S is a <math>(k - 1) \times (k - 1)</math> covariance matrix:</p> $S = [S_{kl}] = \begin{cases} \frac{\hat{p}_{1k}(1 - \hat{p}_{1k}) + \hat{p}_{2k}(1 - \hat{p}_{2k})}{2}, & k = 1 \\ \frac{\hat{p}_{1k}\hat{p}_{1l} + \hat{p}_{2k}\hat{p}_{2l}}{2}, & k \neq l \end{cases}$ <p>, <math>T = (\hat{p}_{12}, \dots, \hat{p}_{1k})'</math>, <math>C = (\hat{p}_{22}, \dots, \hat{p}_{2k})'</math> and <math>\hat{p}_{jk} = P(\text{category } k   \text{treatment arm } j)</math>, <math>j = 1, 2, k = 2, 3, \dots, k</math></p>

### Bias potential

Bias potential assesses the degree to which the observed association between the exposure of interest and the outcome is affected by conditioning on the variable. Bias potential will be measured using the relative change in coefficient (RCC) of the exposure when the covariate is added into the model predicting outcome (

Table 4).

**Table 4. Formulae for Relative Change in Co-efficient**

Outcome type	Regression type	Formula
Continuous	Linear	$RCC = 100 * \text{abs} \left\{ \frac{(\beta_{\text{crude}} - \beta_{\text{adjusted}})}{\beta_{\text{crude}}} \right\}$
Binary	Logistic	$RCC = 100 * \text{abs}(1 - e^{(\beta_{\text{crude}} - \beta_{\text{adjusted}})})$
Time-to-event	Cox-Proportional Hazard	
Count	Poisson	
Where $\beta_{\text{crude}}$ is the co-efficient of exposure in the crude model and $\beta_{\text{adjusted}}$ is the co-efficient of exposure after adding the covariate in the model.		

It is called bias potential since the bias was estimated without other covariates in the model. To what extent a variable introduces bias into a model will depend on the total model. Baseline balance and bias potential statistics will be presented to the steering committee with recommendations for the final selection of variables to be used for matching. In general, this will include unbalanced characteristics (SMD>10%) with bias potential defined as more than 2% change in coefficient (RCC>2%).

### **Matching process**

Exact matching for categorical variables and matching within a maximum calliper (maximum distance allowed within matched pairs) for continuous variables will be used to match patients using nearest neighbour variable mixed matching with a match maximum of 1:3 without replacement. In case less than 70% of the cases can be matched to 3 controls, only 1:1 matching will be used to avoid introducing bias by unequal cohorts.

In case of multiple eligible periods for a patient, only one period can contribute to the matching. In case a patient contributes episodes to the controls and cases, only the first case episode will be used. Matching will be repeated several times with a different patient sequence to select the run that results in the optimal combination of number of patients and baseline balance statistics. The actual number of variables used for the matching will largely depend on the degree of restriction caused by the matching process. In case too many patients are excluded, because they cannot be matched to controls, the number of matching variables will be reduced or the calliper of individual variables will be increased.

In case no satisfactory number of matched patients can be achieved with a minimum set of confounders, a different approach towards handling confounding will be used.

A propensity score will be generated using all available baseline information of the patients. The optimal combination of a set of confounders for direct matching as well as the

propensity score will be explored. In case there is still no satisfactory number of matched patients, methods only using the propensity score will be explored (using the score for matching, regression adjustment or inverse probability of treatment weighting (IPTW)). The quality of matching will be assessed by using four indicators: The percentage of a number of predefined baseline variables for which the following is achieved: 1) SMD <10%; 2) SMD <5%; 3) RCC <2%; 4) RCC <1%.

Missing data will be treated as missing completely at random and will not be imputed. If a selected confounder has more than 20% of missing data it will not be used for matching. If the percentage of missing data is below 20%, the variable will be encoded into a categorical variable, adding a category for the observations with missing values, enabling this variable to be used for matching.

### ***Residual confounding identification***

For each outcome cohort baseline characterisation of the matched sample will be carried out using the same statistics as used in the unmatched baseline characterisation: descriptive statistics, standardised mean difference and bias potential.

All variables with less than 10% missing values in each treatment arm, showing a bias potential of at least 2% will be identified and considered for adjustment in the outcome models.

Since it is possible that variables are correlated, we will assess their bias conditional on the variables already in the model. Starting with a regression model with exposure as the only explanatory variable, variables will be added one by one in order of their individual bias potential, highest first. After a variable is added to the model it will be kept in if it causes a change-in-estimate of at least 2%, relative to the prior model. In case a variable causes a regression model not to converge it is discarded.



## 5.3 Analysis of study outcomes

### *Objective 1*

Distributions of all outcome variables will be provided for the complete dataset and by patients comparison groups as described above.

Conditional negative binomial regression will be performed to estimate adjusted Rate Ratios (RR) with 95% confidence intervals (CI) for the effect of treatment on outcomes that involve counted numbers of events over fixed time periods. Patients who were lost to follow-up or who died during the first year of follow-up will be excluded from these analyses.

An intention-to-treat analysis will be performed to analyse the association between treatment and time to the first outcome event with right censoring at the time of death or loss to follow-up. Kaplan-Meier curves will be used to describe event-free survival over time. Comparisons are made with the use of a log-rank test.

Stratified Cox regression will be performed with time to the first event as the outcome variable to estimate Hazard Ratios (HR) with 95% CI of the treatment effect.

Conditional logistic regression analysis will be performed with mMRC score ( $\geq 2$  vs.  $< 2$ ) as the outcome to estimate Odds Ratios (OR) with 95% CI in those patients who have this available

### *Objective 2*

Analysis for objective 2 will be carried out by adding the relevant interaction term of therapy and characteristic for statistical testing of effect modification. Effect estimates will be presented for different categories of the studied factor separately. To account for multiple testing of interaction comparisons, a multiple testing correction (controlling the False Discovery Rate at 5%) will be applied to significance levels where appropriate.<sup>30</sup> To assess the effect of triple therapy characteristics that exist in one of the treatment arms only (such as ICS substance), analyses will be performed in the triple therapy arm only by studying the independent effects of these characteristics on study outcomes.

### *Objective 3*

The change in FEV<sub>1</sub> over time will be analysed using a multilevel model for change. The level-1 component of this model will be the individual growth model, representing the change in FEV<sub>1</sub> over time within patients. The level-2 component codifies the mean difference in FEV<sub>1</sub> decline within pairs and the level-3 component will represent the mean population

difference in lung function decline with therapy. Mixed linear regression will be used to analyse the data. Intercept and slope (rate of decline over time ) will be modelled as random effects (to vary across individual). A matched-pair specific random effect will also be added to the model as will be potential confounders.

#### 5.4 Confounding factors

All demographics and baseline characteristics listed in paragraph 4.2 will be evaluated for potential confounding effects before and after matching as described above.

#### 5.5 Software used and power calculation

The dataset will be analysed using SAS version 9.3 and Stata SE version 14.2 (StataCorp, College Station, TX).

A feasibility study performed in OPCRCD found that at least 500 patients can be compared with 1,500 patients in each study design. At least the same number of patients are expected to be available from CPRD.

Using the combined dataset, 3000 patients on stable LAMA/LABA matched to 1000 patients stepping-up to TT will give 87% statistical power to find a 20% lower hazard rate in the TT group, assuming 40% of patients on stable LAMA/LABA therapy experience at least one exacerbation during one year of follow-up ( $\alpha=0.05$ ).

### 6.0 Regulatory and ethical compliance

This study was designed and shall be implemented and reported in accordance with the criteria of the “European Network Centres for Pharmacoepidemiology and Pharmacovigilance (ENCePP) study” and follows the ENCePP Code of Conduct (EMA 2014). Once a final version of the protocol has been agreed and reviewed by the advisory group, this study will be registered with [www.encepp.eu](http://www.encepp.eu).

### 7.0 Data dissemination

Initial results will be presented in poster and/or oral format at appropriate thoracic conferences. At least one manuscript containing more detailed results and methodology will be submitted to a journal specialising in respiratory medicine. Submission for publications will be made as soon as the analyses are completed and the results are verified.

## 8.0 Advisory group

- Alberto Papi (lead): Professor of Respiratory Medicine, University of Ferrara, Italy
- Dirkje S. Postma: University Medical Center Groningen, Groningen, The Netherlands
- David Price: Professor of Primary Care Respiratory Medicine, University of Aberdeen, Aberdeen, UK; President, Optimum Patient Care Ltd and Chairman of the Respiratory Effectiveness Group
- Leonardo Fabbri: Professor of Respiratory Medicine, University of Modena, Italy
- Claus Vogelmeier: University Medical Center Giessen and Marburg, Philipps-University Marburg
- Dave Singh: Professor of clinical pharmacology and respiratory medicine, University of Manchester

## 9.0 Research team

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### **Study sponsor:**

Chiesi

### **Primary contact**

Mario Scuri

## 10.0 Timelines

Action	Timeline
Study start date	1 May 2017
Protocol sign off	15 May 2017
ISAC and ADEPT application submission	23 May 2017
Final Report delivery	30 July 2017

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## 12.0 APPENDIX

### 12.1 Diagnostic codes for COPD

Medcode	Read code	Read term
794	H32..00	Emphysema
998	H3...11	Chronic obstructive airways disease
1001	H3...00	Chronic obstructive pulmonary disease
3243	H31..00	Chronic bronchitis
5710	H3z..00	Chronic obstructive airways disease NOS
5798	H312000	Chronic asthmatic bronchitis
5909	H312011	Chronic wheezy bronchitis
9876	H38..00	Severe chronic obstructive pulmonary disease
10802	H37..00	Moderate chronic obstructive pulmonary disease
10863	H36..00	Mild chronic obstructive pulmonary disease
10980	H322.00	Centrilobular emphysema
11150	H311.00	Mucopurulent chronic bronchitis
12166	H3y..00	Other specified chronic obstructive airways disease
14798	H312100	Emphysematous bronchitis
15157	H31z.00	Chronic bronchitis NOS
15626	H310000	Chronic catarrhal bronchitis
16410	H32yz00	Other emphysema NOS
23492	H320z00	Chronic bullous emphysema NOS
24248	H313.00	Mixed simple and mucopurulent chronic bronchitis
25603	H310.00	Simple chronic bronchitis
26125	H312300	Bronchiolitis obliterans
26306	H320.00	Chronic bullous emphysema
27819	H312.00	Obstructive chronic bronchitis
33450	H32z.00	Emphysema NOS
37247	H3z..11	Chronic obstructive pulmonary disease NOS
37959	H311100	Fetid chronic bronchitis
40159	H311000	Purulent chronic bronchitis
40788	H32y.00	Other emphysema
44525	H312z00	Obstructive chronic bronchitis NOS
45089	H31y100	Chronic tracheobronchitis
46578	H321.00	Panlobular emphysema
56860	H320000	Segmental bullous emphysema
59263	H32y111	Acute interstitial emphysema
60188	H320200	Giant bullous emphysema
61118	H310z00	Simple chronic bronchitis NOS
61513	H311z00	Mucopurulent chronic bronchitis NOS



63216	H464100	Obliterative bronchiolitis due to chemical fumes
63479	H32y200	MacLeod's unilateral emphysema
64721	H464000	Chronic emphysema due to chemical fumes
65733	Hyu3100	[X]Other specified chronic obstructive pulmonary disease
66043	H31y.00	Other chronic bronchitis
66058	Hyu3000	[X]Other emphysema
67040	H3y..11	Other specified chronic obstructive pulmonary disease
68066	H31yz00	Other chronic bronchitis NOS
68662	H320100	Zonal bullous emphysema
70787	H32y100	Atrophic (senile) emphysema
92955	H32y000	Acute vesicular emphysema
93568	H39..00	Very severe chronic obstructive pulmonary disease
99536	H320300	Bullous emphysema with collapse
103733	H320311	Tension pneumatocele
104608	H3A..00	End stage chronic obstructive airways disease
106650	H583200	Eosinophilic bronchitis
109958	H3B..00	Asthma-chronic obstructive pulmonary disease overlap syndrome
111668	H32yz11	Sawyer - Jones syndrome

## 12.2 Codes for active asthma

Medcode	Read code	Read term
78	H33..	Asthma
185	H333.	Acute exacerbation of asthma
232	H33z1	Asthma attack
233	H33z0	Status asthmaticus NOS
1208	H330.	Extrinsic (atopic) asthma
1555	H33..	Asthma
2290	H330.	Extrinsic (atopic) asthma
3018	663V1	Mild asthma
3366	663V3	Severe asthma
3458	663V0	Occasional asthma
3665	H331.	Intrinsic asthma
4442	H33z.	Asthma unspecified
4606	H33zz	Asthma NOS
4892	H33z0	Status asthmaticus NOS
5267	H331.	Intrinsic asthma
5627	H3300	Extrinsic asthma without status asthmaticus
5798	H3120	Chronic asthmatic bronchitis
5867	173A.	Exercise induced asthma
5909	H3120	Chronic asthmatic bronchitis

6707	H3301	Extrinsic asthma with status asthmaticus
7058	8H2P.	Emergency admission, asthma
7146	H330.	Extrinsic (atopic) asthma
7191	663P.	Asthma limiting activities
7378	663U.	Asthma management plan given
7416	663N.	Asthma disturbing sleep
7731	H330.	Extrinsic (atopic) asthma
8335	H33z1	Asthma attack
9018	663y.	Number of asthma exacerbations in past year
9552	66Y5.	Change in asthma management plan
9663	66Y9.	Step up change in asthma management plan
10043	66YJ.	Asthma annual review
10274	8B3j.	Asthma medication review
10487	663j.	Asthma - currently active
11022	178..	Asthma trigger
11370	1O2..	Asthma confirmed
12987	H33z2	Late-onset asthma
13064	663V.	Asthma severity
13065	663V2	Moderate asthma
13173	663O.	Asthma not disturbing sleep
13174	663Q.	Asthma not limiting activities
13175	663N2	Asthma disturbs sleep frequently
14777	H3300	Extrinsic asthma without status asthmaticus
15248	H330.	Extrinsic (atopic) asthma
16070	H33zz	Asthma NOS
16667	8795.	Asthma control step 2
16785	8794.	Asthma control step 1
18207	H33zz	Asthma NOS
18223	66YA.	Step down change in asthma management plan
18224	8796.	Asthma control step 3
18323	H3311	Intrinsic asthma with status asthmaticus
18692	9hA..	Exception reporting: asthma quality indicators
19519	663p.	Asthma treatment compliance unsatisfactory
19520	663n.	Asthma treatment compliance satisfactory
20860	8798.	Asthma control step 5
20886	8797.	Asthma control step 4
21232	H33zz	Asthma NOS
22752	173c.	Occupational asthma
24479	663d.	Emergency asthma admission since last appointment
24506	8791.	Further asthma - drug prevent.
24884	663u.	Asthma causes daytime symptoms 1 to 2 times per week
25181	663e.	Asthma restricts exercise
25796	H332.	Mixed asthma
26496	679J.	Health education - asthma

26501	663s.	Asthma never causes daytime symptoms
26503	663v.	Asthma causes daytime symptoms most days
26504	663f.	Asthma never restricts exercise
26506	6630.	Asthma severely restricts exercise
26861	663e0	Asthma sometimes restricts exercise
27926	H3301	Extrinsic asthma with status asthmaticus
29325	H3310	Intrinsic asthma without status asthmaticus
29645	8793.	Asthma control step 0
30815	663N0	Asthma causing night waking
31225	663t.	Asthma causes daytime symptoms 1 to 2 times per month
32727	H33z.	Asthma unspecified
38143	663O0	Asthma never disturbs sleep
38144	663w.	Asthma limits walking up hills or stairs
38145	663x.	Asthma limits walking on the flat
38146	663N1	Asthma disturbs sleep weekly
39570	663r.	Asthma causes night symptoms 1 to 2 times per month
40823	H334.	Brittle asthma
41017	1780.	Aspirin induced asthma
42824	663q.	Asthma daytime symptoms
45073	H331z	Intrinsic asthma NOS
45782	H330z	Extrinsic asthma NOS
47337	663m.	Asthma accident and emergency attendance since last visit
47684	H47y0	Detergent asthma
58196	H3311	Intrinsic asthma with status asthmaticus
93736	388t.	Royal College of Physicians asthma assessment
93738	388t.	Royal College of Physicians asthma assessment
98185	38DL.	Asthma control test
99793	8CMA0	Patient has a written asthma personal action plan
100107	679J0	Health education - asthma self management
100397	38DT.	Asthma control questionnaire
100740	679J1	Health education - structured asthma discussion
102170	66Yp.	Asthma review using Roy Colleg of Physicians three questions
102209	38DV.	Mini asthma quality of life questionnaire
102301	1787.	Asthma trigger - seasonal
102341	1781	Asthma trigger - pollen
102395	66Yr.	Asthma causes symptoms most nights
102400	66Yq.	Asthma causes night time symptoms 1 to 2 times per week
102449	1789.	Asthma trigger - respiratory infection
102713	663P0	Asthma limits activities 1 to 2 times per month
102871	178B.	Asthma trigger - exercise
102888	663P1	Asthma limits activities 1 to 2 times per week
102952	1783.	Asthma trigger - warm air
103318	679J2	Health education - structured patient focused asthma discuss
103321	1786.	Asthma trigger - animals

103631	388t0	Royal College Physician asthma assessment 3 question score
103813	1788.	Asthma trigger - cold air
103944	178A.	Asthma trigger - airborne dust
103945	1785.	Asthma trigger - damp
103952	1784.	Asthma trigger - emotion
103955	1782.	Asthma trigger - tobacco smoke
103998	663P2	Asthma limits activities most days
106805	H335.	Chronic asthma with fixed airflow obstruction
109958	H3B..	Asthma-chronic obstructive pulmonary disease overlap syndrome

### 12.3 Codes for other chronic respiratory conditions

Medcode	Read code	Read term
947	H51z.	Pleural effusion NOS
2587	B22z.	Malignant neoplasm of bronchus or lung NOS
2680	23E5.	O/E - fibrosis of lung present
3859	H57y2	Pulmonary sarcoidosis
3903	B22z.	Malignant neoplasm of bronchus or lung NOS
4137	B570.	Secondary malignant neoplasm of lung
5005	H410.	Pleural plaque disease due to asbestosis
5519	H563.	Idiopathic fibrosing alveolitis
6051	H5631	Diffuse pulmonary fibrosis
6220	C370.	Cystic fibrosis
6471	B57..	Secondary malign neop of respiratory and digestive systems
6624	H5010	Pleural abscess
6837	H563.	Idiopathic fibrosing alveolitis
7321	H541z	Pulmonary oedema NOS
7484	B226.	Mesothelioma
7593	H51y7	Malignant pleural effusion
7791	H55..	Postinflammatory pulmonary fibrosis
7994	23E5.	O/E - fibrosis of lung present
8303	H41..	Asbestosis
8317	H58y3	Interstitial lung disease NEC
9267	B812.	Carcinoma in situ of bronchus and lung
9600	B232.	Mesothelioma of pleura
10358	B222.	Malignant neoplasm of upper lobe, bronchus or lung
11312	H35..	Extrinsic allergic alveolitis
11665	H5X..	Pleural condition, unspecified
11833	H35z1	Hypersensitivity pneumonitis NOS
12582	B2241	Malignant neoplasm of lower lobe of lung
12870	B221.	Malignant neoplasm of main bronchus
13243	B22..	Malignant neoplasm of trachea, bronchus and lung

13264	C370.	Cystic fibrosis
14913	A1202	Tuberculous hydrothorax
15221	B220.	Malignant neoplasm of trachea
15588	H350.	Farmers' lung
15815	H56z.	Alveolar and parietoalveolar disease NOS
16213	B572.	Secondary malignant neoplasm of pleura
16741	A114.	Tuberculous fibrosis of lung
17391	B2210	Malignant neoplasm of carina of bronchus
18081	H51yz	Other pleural effusion
18678	B2240	Malignant neoplasm of lower lobe bronchus
18905	C3703	Cystic fibrosis with intestinal manifestations
18914	C3702	Cystic fibrosis with pulmonary manifestations
19492	H40..	Coal workers' pneumoconiosis
20170	B222.	Malignant neoplasm of upper lobe, bronchus or lung
21257	H4...	Lung disease due to external agents
21698	B221z	Malignant neoplasm of main bronchus NOS
21973	H4...	Lung disease due to external agents
22536	H4y10	Chronic pulmonary fibrosis following radiation
23446	H42z.	Silica pneumoconiosis NOS
23461	H43z.	Pneumoconiosis due to inorganic dust NOS
24137	C370.	Cystic fibrosis
24301	B57..	Secondary malign neop of respiratory and digestive systems
24466	H58y0	Broncholithiasis
25013	H4...	Lung disease due to external agents
25372	B812z	Carcinoma in situ of bronchus or lung NOS
25886	B2221	Malignant neoplasm of upper lobe of lung
26082	H5410	Chronic pulmonary oedema
26442	H441.	Cannabinosis
27345	H352.	Bird-fancier's lung
27348	H561.	Idiopathic pulmonary haemosiderosis
27715	B242.	Malignant neoplasm of anterior mediastinum
28229	H563z	Idiopathic fibrosing alveolitis NOS
29283	B2zy.	Malignant neoplasm of other site of respiratory tract
30065	H51y.	Other pleural effusion excluding mention of tuberculosis
30214	H54..	Pulmonary congestion and hypostasis
30235	H434.	Siderosis
31188	B224.	Malignant neoplasm of lower lobe, bronchus or lung
31268	B223.	Malignant neoplasm of middle lobe, bronchus or lung
31319	H5830	Loeffler's syndrome
31423	H45..	Pneumoconiosis NOS
31447	H3521	Pigeon-fanciers' lung
31573	B23..	Malignant neoplasm of pleura
31700	B2220	Malignant neoplasm of upper lobe bronchus
31722	H46..	Respiratory disease due to chemical fumes and vapours

31806	H56..	Other alveolar and parietoalveolar disease
33444	B2211	Malignant neoplasm of hilus of lung
33663	H46zz	Respiratory conditions due to chemical fumes NOS
33830	H56yz	Other alveolar and parietoalveolar disease NOS
33980	AD50.	Sarcoidosis of lung
34001	H4z..	Lung disease due to external agents NOS
34075	B2...	Malig neop of respiratory tract and intrathoracic organs
34651	H5001	Empyema with bronchopleural fistula
34742	B23z.	Malignant neoplasm of pleura NOS
35053	B57..	Secondary malig neop of respiratory and digestive systems
35058	B8121	Carcinoma in situ of main bronchus
36240	H352z	Bird-fancier's lung NOS
36371	B225.	Malignant neoplasm of overlapping lesion of bronchus & lung
36622	C3701	Cystic fibrosis with meconium ileus
37365	H440.	Byssinosis
37579	B8122	Carcinoma in situ of upper lobe bronchus and lung
37810	B220z	Malignant neoplasm of trachea NOS
38052	H5013	Lung empyema NOS
38297	H540.	Pulmonary hypostasis
38298	PK35.	Kartagener's syndrome
38961	B22y.	Malignant neoplasm of other sites of bronchus or lung
38985	H4y..	Other specified lung diseases due to external agent
39478	H35y7	Wood asthma
39531	B25..	Malig neo, overlapping lesion of heart, mediastinum & pleura
39706	H5840	Postoperative pulmonary oedema
39923	B2231	Malignant neoplasm of middle lobe of lung
40595	Byu20	[X]Malignant neoplasm of bronchus or lung, unspecified
40953	H55..	Postinflammatory pulmonary fibrosis
41015	H4710	Lipoid pneumonia (exogenous)
41491	H341.	Post-infective bronchiectasis
41523	B2230	Malignant neoplasm of middle lobe bronchus
41694	H355.	Mushroom workers' lung
42566	B224z	Malignant neoplasm of lower lobe, bronchus or lung NOS
42569	B2zz.	Malignant neoplasm of respiratory tract NOS
43285	H48..	Progressive massive fibrosis
43417	H4y21	Chronic drug-induced interstitial lung disorders
44015	H4y2.	Drug-induced interstitial lung disorders
44169	B222z	Malignant neoplasm of upper lobe, bronchus or lung NOS
44356	B2z..	Malig neop other/ill-defined sites resp/intrathoracic organs
44425	H5012	Pleural empyema
45307	B2...	Malig neop of respiratory tract and intrathoracic organs
45427	H35y5	Pituitary snuff-takers' disease
46405	H540z	Pulmonary hypostasis NOS
46460	H42..	Silica and silicate pneumoconiosis

46497	B81y0	Carcinoma in situ of pleura
46628	H5015	Pyopneumothorax
47142	H464.	Chronic respiratory conditions due to chemical fumes
47782	H4642	Chronic pulmonary fibrosis due to chemical fumes
47897	B8123	Carcinoma in situ of middle lobe bronchus and lung
48647	H46z.	Respiratory conditions due to chemical fumes NOS
49159	B8120	Carcinoma in situ of carina of bronchus
49194	H432.	Berylliosis
49709	H5y30	Fibrosis of mediastinum
49770	C370z	Cystic fibrosis NOS
50374	H4y1z	Chronic pulmonary radiation disease NOS
51410	H41z.	Asbestosis NOS
51551	B571.	Secondary malignant neoplasm of mediastinum
51714	B811.	Carcinoma in situ of trachea
51858	H35y.	Other allergic alveolitis
52373	B8124	Carcinoma in situ of lower lobe bronchus and lung
52850	Hyu70	[X]Pleural effusion in conditions classified elsewhere
53851	Hyu42	[X]Airway disease due to other specific organic dusts
53943	H35y1	Coffee-workers' lung
54010	H57y0	Pulmonary amyloidosis
54134	B223z	Malignant neoplasm of middle lobe, bronchus or lung NOS
54669	Hyu6.	[X]Suppurative & necrotic conditions of lower resp tract
54706	Hyu5.	[X]Other resp diseases principally affecting interstitium
54822	H3520	Budgerigar-fanciers' lung
55552	H35yz	Other allergic alveolitis NOS
55557	H4yy.	Other external agent causing respiratory condition
56427	P861.	Congenital bronchiectasis
56652	H356.	Maple bark strippers' lung
57092	H51y0	Encysted pleurisy
58841	AD52.	Sarcoidosis of lung with sarcoidosis of lymph nodes
59188	Hy02.	Chronic pulmonary insufficiency following surgery
59426	B81y.	Carcinoma in situ of other specified part respiratory system
60313	H44..	Pneumopathy due to inhalation of other dust
60805	H420.	Talc pneumoconiosis
61064	B24X.	Malignant neoplasm of mediastinum, part unspecified
61119	H560.	Pulmonary alveolar proteinosis
61229	H54z.	Pulmonary congestion and hypostasis NOS
62200	H351.	Bagassosis
62233	H421.	Simple silicosis
62442	H35z0	Allergic extrinsic alveolitis NOS
62556	B24..	Malignant neoplasm of thymus, heart and mediastinum
62584	B573.	Secondary malignant neoplasm of other respiratory organs
62707	H4yz.	External agent causing respiratory conditions NOS
63172	H450.	Pneumoconiosis associated with tuberculosis

63174	H563.	Idiopathic fibrosing alveolitis
63216	H4641	Obliterative bronchiolitis due to chemical fumes
64050	B81..	Carcinoma in situ of respiratory system
65060	Hyu50	[X]Other interstitial pulmonary diseases with fibrosis
65117	A7899	HIV disease resulting in lymphoid interstitial pneumonitis
65344	C3700	Cystic fibrosis with no meconium ileus
65376	H43..	Pneumoconiosis due to other inorganic dust
65793	B2z0.	Malig neop of upper respiratory tract, part unspecified
66083	B57z.	Secondary malig neop of respiratory or digestive system NOS
66646	B26..	Malignant neoplasm, overlap lesion of resp & intrathor orgs
66750	B24z.	Malignant neoplasm of heart, thymus and mediastinum NOS
66856	H5000	Empyema with bronchocutaneous fistula
67107	B230.	Malignant neoplasm of parietal pleura
67709	H354.	Malt workers' lung
68814	H562.	Pulmonary alveolar microlithiasis
69017	C3701	Cystic fibrosis with meconium ileus
69452	H35y8	Air-conditioner and humidifier lung
69914	H4y1.	Chronic pulmonary radiation disease
70286	H35y2	Fish-meal workers' lung
70815	H464z	Chronic respiratory conditions due to chemical fumes NOS
71853	H422.	Complicated silicosis
72221	H5851	Pulmonary insufficiency following surgery
72595	AD54.	Sarcoidosis of inferior turbinates
73065	C370y	Cystic fibrosis with other manifestations
73414	H44z.	Pneumopathy due to inhalation of other dust NOS
89206	H423.	Massive silicotic fibrosis
91912	Hyu51	[X]Other specified interstitial pulmonary diseases
91989	H35y0	Cheese-washers' lung
92720	B243.	Malignant neoplasm of posterior mediastinum
93098	SP130	Mendelson's syndrome as a complication of care
93206	H353.	Suberosis ( cork-handlers' lung )
93353	H35y6	Sequoiosis (red-cedar asthma)
93380	C10N1	Cystic fibrosis related diabetes mellitus
93577	H435.	Stannosis
93880	H5850	Pulmonary insufficiency following shock
94136	H5630	Alveolar capillary block
94575	H433.	Graphite fibrosis of lung
94894	H431.	Bauxite fibrosis of lung
96754	H5852	Pulmonary insufficiency following trauma
97954	B81y.	Carcinoma in situ of other specified part respiratory system
98104	B23y.	Malignant neoplasm of other specified pleura
99547	H5004	Empyema with pleural fistula NOS
100232	B24y.	Malig neop of other site of heart, thymus and mediastinum
100577	Hyu49	[X]Respiratory conditions/other specified external agents



100610	C3704	Arthropathy in cystic fibrosis
100994	H410.	Pleural plaque disease due to asbestosis
102492	H510C	Pleural plaque
102922	C3708	Cystic fibrosis related cirrhosis
103224	C3705	Cystic fibrosis with distal intestinal obstruction syndrome
103472	H5632	Pulmonary fibrosis
103559	H5633	Usual interstitial pneumonitis
103637	H35..	Extrinsic allergic alveolitis
103753	H563.	Idiopathic fibrosing alveolitis
103785	H58y5	Respiratory bronchiolitis associated interstitial lung dis
103946	B2201	Malignant neoplasm of mucosa of trachea
104557	H465.	Chemical-induced pulmonary oedema
104915	H58y7	Interstitial lung disease due to connective tissue disease
105628	Hyu48	[X]Chronic+other pulmonary manifestations due to radiation
105939	Hyu40	[X]Pneumoconiosis due to other dust containing silica
106194	B231.	Malignant neoplasm of visceral pleura
106432	C3709	Exacerbation of cystic fibrosis
106515	Hyu43	[X]Hypersensitivity pneumonitis due to other organic dusts
106925	Hyu4A	[X]Respiratory conditions due to unspecified external agent
109815	H58y6	Interstitial lung disease due to collagen vascular disease
110454	C3707	Liver disease due to cystic fibrosis
110881	Hyu44	[X]Upper resp inflammation/chemicals,gases,fumes,vapours,NEC
110883	Hyu4.	[X]Lung diseases due to external agents

## 12.4 Codes for pneumonia

Medcode	Read code	Read term
572	H26..	Pneumonia due to unspecified organism
886	H25..	Bronchopneumonia: [unspecified organism] or [chest infection - unspecified]
1576	H231.	Pneumonia due to mycoplasma pneumoniae
1849	H21..	Pneumococcal pneumonia (& lobar)
3683	H261.	Basal pneumonia due to unspecified organism
4910	H56y1	Interstitial pneumonia
5202	H20..	Viral pneumonia (& chest infection)
5324	H28..	Atypical pneumonia
5612	H224.	Staphylococcal pneumonia
6094	H2z..	Pneumonia or influenza NOS
8318	H2600	Lung consolidation
9389	H20..	Viral pneumonia (& chest infection)
9639	H260.	Lobar pneumonia due to unspecified organism
9953	A116.	Tuberculous pneumonia
10086	H2...	Pneumonia and influenza

11849	H2y..	Other specified pneumonia or influenza
12061	H22y2	Legionella pneumonia
12423	H223.	Streptococcal pneumonia
13573	H2700	Influenza with bronchopneumonia
14976	H20z.	Viral pneumonia NOS
15912	H270.	Influenzal pneumonia
16287	H25..	Bronchopneumonia: [unspecified organism] or [chest infection - unspecified]
17025	H233.	Chlamydial pneumonia
19400	H26..	Pneumonia due to unspecified organism
22795	H22..	Other bacterial pneumonia
23095	H22z.	Bacterial pneumonia NOS
23333	H5400	Hypostatic pneumonia
23546	H220.	Pneumonia due to Klebsiella pneumoniae
23726	H24y7	Chickenpox pneumonia
24356	H5401	Hypostatic bronchopneumonia
25694	H23..	Pneumonia due to other specified organisms
27519	H24y2	Pneumocystis carinii pneumonia
28634	H22..	Other bacterial pneumonia
29166	H21..	Pneumococcal pneumonia (& lobar)
29457	H270.	Influenzal pneumonia
30437	H243.	Pertussis pneumonia
30591	H221.	Pseudomonal pneumonia
30653	H23..	Pneumonia due to other specified organisms
31269	H201.	Pneumonia due to respiratory syncytial virus
33478	H20y.	Viral pneumonia NEC
34251	H23z.	Pneumonia due to specified organism NOS
34274	H246.	Pneumonia with aspergillosis
35082	H243.	Pertussis pneumonia
35189	H5303	Abscess of lung with pneumonia
35745	H270z	Influenza with pneumonia NOS
36675	H202.	Parainfluenzal pneumonia
37881	H222.	Haemophilus influenzae pneumonia
40299	AB24.	Pneumonia - candidal
41034	H240.	Measles pneumonia
43286	H241.	Cytomegalovirus pneumonia
43884	H22yz	Pneumonia due to bacteria NOS
45425	H22y1	Proteus pneumonia
48481	AB24.	Pneumonia - candidal
48804	H222.	Haemophilus influenzae pneumonia
49398	H24y6	Typhoid pneumonia
50867	H22y.	Pneumonia due to other specified bacteria
51398	A3By4	Mycoplasmal pneumonia
52071	H2470	Candidal pneumonia
52520	Hyu08	[X]Other viral pneumonia

53753	Hyu0H	[X]Other pneumonia, organism unspecified
53947	Hyu0D	[X]Pneumonia in viral diseases classified elsewhere
53969	H247z	Pneumonia with systemic mycosis NOS
58896	A0222	Salmonella pneumonia
60299	H22y0	Escherichia coli pneumonia
61623	H24y0	Actinomycotic pneumonia
62623	H242.	Pneumonia with ornithosis
62632	H2701	Influenza with pneumonia, influenza virus identified
63763	Hyu0A	[X]Other bacterial pneumonia
63858	H2230	Group B streptococcal pneumonia
65419	H22y0	Escherichia coli pneumonia
66362	H24z.	Pneumonia with infectious diseases EC NOS
67836	H200.	Adenoviral pneumonia
67901	H24y1	Nocardial pneumonia
69782	H24y.	Pneumonia with other infectious diseases EC
70559	H24yz	Pneumonia with other infectious diseases EC NOS
73735	H232.	Pneumonia due to pleuropneumonia-like organism
98381	Hyu0B	[X]Pneumonia due to other specified infectious organisms
98782	H24y5	Toxoplasma pneumonia
101292	AB415	Histoplasma duboisii with pneumonia
101507	AB405	Histoplasma capsulatum with pneumonia
103404	H2471	Pneumonia with coccidioidomycosis
104121	H2B..	Community acquired pneumonia
104264	H2C..	Hospital acquired pneumonia
106300	H203.	Pneumonia due to human metapneumovirus
106908	H244.	Tularaemia pneumonia
110440	H247.	Pneumonia with other systemic mycoses
111027	Hyu0C	[X]Pneumonia in bacterial diseases classified elsewhere

## 12.5 Codes for rhinitis

Medcode	Read code	Read term
121	H170.	Allergic rhinitis due to pollens
175	H17..	Allergic rhinitis
774	H120.	Chronic rhinitis
775	H172.	Allergic rhinitis due to unspecified allergen
805	H1201	Chronic catarrhal rhinitis
964	H17z.	Allergic rhinitis NOS
1108	H18..	Vasomotor rhinitis
1468	H17..	Allergic rhinitis
1838	H170.	Allergic rhinitis due to pollens
1930	H171.	Allergic rhinitis due to other allergens
2372	H171.	Allergic rhinitis due to other allergens
2769	H1201	Chronic catarrhal rhinitis

3162	H171.	Allergic rhinitis due to other allergens
3798	H172.	Allergic rhinitis due to unspecified allergen
4861	H171.	Allergic rhinitis due to other allergens
8975	H120.	Chronic rhinitis
13377	H171.	Allergic rhinitis due to other allergens
14645	H120z	Chronic rhinitis NOS
15553	H1202	Chronic hypertrophic rhinitis
16134	H171.	Allergic rhinitis due to other allergens
16158	H1204	Chronic infective rhinitis
16441	H1203	Chronic atrophic rhinitis
18572	H17..	Allergic rhinitis
24163	H170.	Allergic rhinitis due to pollens
28589	H1200	Chronic simple rhinitis
30375	H171.	Allergic rhinitis due to other allergens
42065	H1206	Chronic membranous rhinitis
42556	H1205	Chronic ulcerative rhinitis
47599	Hyu21	[X]Other allergic rhinitis
72490	Hyu20	[X]Other seasonal allergic rhinitis
104543	H1207	Chronic fibrinous rhinitis

## 12.6 Codes for eczema

Medcode	Read code	Read term
230	M12z1	Eczema NOS
488	M12z0	Dermatitis NOS
610	M112.	Infantile eczema
900	M2522	Cheiopompholyx
1095	M12z1	Eczema NOS
1240	M113.	Flexural eczema
1424	M12z2	Infected eczema
1427	M12..	Contact dermatitis and other eczemas
1578	M2521	Pompholyx unspecified
1741	M111.	Atopic dermatitis/eczema
1961	M12y8	Contact dermatitis due to metals
3699	M12z3	Hand eczema
4684	M119.	Discoid eczema
5000	M102.	Infectious eczematoid dermatitis
5391	M12..	Contact dermatitis and other eczemas
5869	M114.	Allergic (intrinsic) eczema
6180	M11z.	Atopic dermatitis NOS
6399	M12..	Contact dermatitis and other eczemas
6728	M102.	Infectious eczematoid dermatitis
8884	M10..	Erythematous squamous dermatosis

8994	M12z4	Erythrodermic eczema
9335	M129.	Irritant contact dermatitis
10840	M117.	Neurodermatitis - atopic
11132	M1280	Allergic contact dermatitis due to adhesives
13223	M11..	Atopic dermatitis and related conditions
13371	M12y8	Contact dermatitis due to metals
13389	M131.	Ingestion dermatitis due to food
14690	F4D3.	Noninfected eyelid dermatosis
15627	M12..	Contact dermatitis and other eczemas
15879	F4D31	Contact or allergic eyelid dermatitis
16685	F4D31	Contact or allergic eyelid dermatitis
16832	F4D31	Contact or allergic eyelid dermatitis
20394	M10z.	Erythematous squamous dermatosis NOS
25178	M2523	Podopompholyx
29774	M12A1	Drug photoallergic response
30664	M1285	Allergic contact dermatitis due to food in contact with skin
31882	M1292	Irritant contact dermatitis due to other chemical products
32406	M12A0	Drug phototoxic response
35602	M183z	Lichenification NOS
35645	M13y.	Ingestion dermatitis due to other specified substance
35797	M125z	Contact dermatitis due to food NOS
35803	M13..	Ingestion dermatitis
38383	M1283	Allergic contact dermatitis due to dyes
38673	M115.	Besnier's prurigo
39721	Myu2.	[X]Dermatitis and eczema
43313	Myu21	[X]Allergic contact dermatitis due to oth chemical products
43888	M1294	Irritant contact dermatitis due to plants, except food
44559	M13z.	Ingestion dermatitis NOS
47312	Myu2C	[X]Other specified dermatitis
50306	M1290	Irritant contact dermatitis due to cosmetics
53384	F4D5.	Other eyelid infective dermatitis
54207	F4D3z	Noninfected eyelid dermatoses NOS
59349	M1y1.	Cutaneous autosensitization
59742	Myu23	[X]Allergic contact dermatitis due to other agents
62943	M1293	Irritant contact dermatitis due to food in contact with skin
63904	F4D4.	Infective eyelid dermatitis of types resulting in deformity
64542	M125z	Contact dermatitis due to food NOS
66631	M1291	Irritant contact dermatitis due drugs in contact with skin
72696	Myu27	[X]Unspecified contact dermatitis due to other agents
100100	8HTu.	Referral to eczema clinic
100551	Myu26	[X]Unspcfd contact dermatitis due to other chemical products

## 12.7 Codes for nasal polyps

Medcode	Read code	Read term
977	H110.	Polyp of nasal cavity
4341	H11y2	Polyp of maxillary sinus
4686	H11..	Nasal polyps
11744	H11y1	Polyp of ethmoidal sinus
14749	H110z	Polyp of nasal cavity NOS
14888	H11z.	Nasal polyp NOS
19742	H11y.	Other polyp of sinus
31837	H1100	Choanal polyp
35897	H11y2	Polyp of maxillary sinus
36229	H1110	Woakes' ethmoiditis
44518	H11yz	Other polyp of sinus NOS
44934	H111.	Polypoid sinus degeneration
47466	H1101	Nasopharyngeal polyp
50528	H111z	Polypoid sinus degeneration NOS
56372	H11y.	Other polyp of sinus
61281	H11y3	Polyp of sphenoidal sinus
69765	Hyu23	[X]Other polyp of sinus
91482	H11y0	Polyp of frontal sinus

## 12.8 Codes for sinusitis

Medcode	Read code	Read term
243	H01..	Sinusitis
1674	H132.	Chronic ethmoidal sinusitis
2233	H13y1	Pansinusitis
2257	H13..	Chronic sinusitis
2984	H131.	Frontal sinusitis
3624	H130.	Maxillary sinusitis
4433	H130.	Chronic maxillary sinusitis
5437	H13z.	Chronic sinusitis NOS
10546	H13..	Chronic rhinosinusitis
15163	H131.	Chronic frontal sinusitis
17173	H135.	Recurrent sinusitis
18572	H17..	Allergic rhinosinusitis
39501	H13y0	Chronic pansinusitis
48703	H133.	Chronic sphenoidal sinusitis
49548	H13y.	Other chronic sinusitis
54375	H13yz	Other chronic sinusitis NOS
63733	Hyu22	[X]Other chronic sinusitis
73094	SN31.	Aerosinusitis

## 12.9 Codes for gastro-oesophageal reflux

Medcode	Read code	Read term
592	J101.	Oesophagitis
984	J10y4	Oesophageal reflux without mention of oesophagitis
1327	J10y4	Oesophageal reflux without mention of oesophagitis
2281	J10y4	Oesophageal reflux without mention of oesophagitis
2535	J1011	Reflux oesophagitis
4614	J1016	Ulcerative oesophagitis
5283	J1016	Ulcerative oesophagitis
5596	J1025	Barrett's ulcer of oesophagus
7104	J1011	Reflux oesophagitis
7577	1957.	Gastric reflux
8259	760L5	Insertion of Angelchick prosthesis
8321	760L8	Laparoscopic Nissen fundoplication using abdominal approach
9115	760L0	Antireflux fundoplication using thoracic approach
10000	760L2	Antireflux fundoplication using abdominal approach
10199	760M2	Removal of Angelchick prosthesis
14713	760L0	Antireflux fundoplication using thoracic approach
14760	J101z	Oesophagitis NOS
14910	76130	Gastroplasty NEC
15054	J1011	Reflux oesophagitis
15579	J1011	Reflux oesophagitis
16450	J1011	Reflux oesophagitis
16605	J1011	Reflux oesophagitis
17263	760L.	Antireflux operations
17610	760L2	Antireflux fundoplication using abdominal approach
18174	760L7	Endoscopic Nissen fundoplication using thoracic approach
18211	760L.	Antireflux operations
18741	760M0	Revision of fundoplication of stomach
18981	760L6	Oesophagogastric fundoplasty
20955	760L0	Antireflux fundoplication using thoracic approach
24021	J1020	Peptic ulcer of oesophagus
25610	J10y4	Oesophageal reflux without mention of oesophagitis
28400	76180	Gastropexy NEC
28619	760Lz	Antireflux operation NOS
34005	760Ly	Other specified antireflux operation
35037	J101y	Other specified oesophagitis
39323	J1015	Phlegmonous oesophagitis
45360	760L3	Antireflux gastropexy
47261	760L6	Oesophagogastric fundoplasty
48146	760L3	Antireflux gastropexy
51400	760M.	Revision of antireflux operations
53657	760L1	Antireflux operation using thoracic approach NEC
61616	760L3	Antireflux gastropexy
67258	760Mz	Revision of antireflux operation NOS

68276	760L1	Antireflux operation using thoracic approach NEC
99526	J10y6	Barrett's oesophagus
103564	760L4	Antireflux procedure and gastroplasty HFQ
109010	J1017	Eosinophilic oesophagitis

## 12.10 Codes for Diabetes Mellitus

Medcode	Read code	Read term
506	C1001	Diabetes mellitus, adult onset, no mention of complication
711	C10..	Diabetes mellitus
758	C10F.	Type 2 diabetes mellitus
1038	C1000	Diabetes mellitus, juvenile type, no mention of complication
1323	F420.	Diabetic retinopathy
1407	C10FJ	Insulin treated Type 2 diabetes mellitus
1549	C10E.	Type 1 diabetes mellitus
1647	C108.	Insulin dependent diabetes mellitus
1682	C101.	Diabetes mellitus with ketoacidosis
1684	66A4.	Diabetic on oral treatment
2340	F3813	Myasthenic syndrome due to diabetic amyotrophy
2342	F372.	Polyneuropathy in diabetes
2475	C104.	Diabetes mellitus with renal manifestation
2478	66AJ1	Brittle diabetes
2986	F4202	Preproliferative diabetic retinopathy
3286	F4201	Proliferative diabetic retinopathy
3837	F4204	Diabetic maculopathy
4513	C109.	Non-insulin dependent diabetes mellitus
5002	F372.	Polyneuropathy in diabetes
5884	C109.	Non-insulin dependent diabetes mellitus
6509	C1087	Insulin dependent diabetes mellitus with retinopathy
6791	C1088	Insulin dependent diabetes mellitus - poor control
7069	F4200	Background diabetic retinopathy
7795	C106.	Diabetes mellitus with neurological manifestation
8403	C1097	Non-insulin dependent diabetes mellitus - poor control
10098	C10yy	Other specified diabetes mellitus with other spec comps
10099	F4203	Advanced diabetic maculopathy
10418	C10ED	Type 1 diabetes mellitus with nephropathy
10659	F4640	Diabetic cataract
10692	C10EM	Type 1 diabetes mellitus with ketoacidosis
10755	F4206	Non proliferative diabetic retinopathy
11551	C10B.	Diabetes mellitus induced by steroids
11626	F420z	Diabetic retinopathy NOS
12455	C10E.	Type 1 diabetes mellitus
12640	C10FC	Type 2 diabetes mellitus with nephropathy
12736	C10F5	Type 2 diabetes mellitus with gangrene



13279	C104y	Other specified diabetes mellitus with renal complications
14803	C1001	Diabetes mellitus, adult onset, no mention of complication
14889	C1001	Diabetes mellitus, adult onset, no mention of complication
15690	C103.	Diabetes mellitus with ketoacidotic coma
16230	C106.	Diabetes mellitus with neurological manifestation
16491	C106.	Diabetes mellitus with neurological manifestation
16502	C104.	Diabetes mellitus with renal manifestation
17067	F1711	Autonomic neuropathy due to diabetes
17247	F35z0	Diabetic mononeuritis NOS
17262	C1096	Non-insulin-dependent diabetes mellitus with retinopathy
17313	F4407	Diabetic iritis
17545	C108F	Insulin dependent diabetes mellitus with diabetic cataract
17858	C108.	Insulin dependent diabetes mellitus
17859	C109.	Non-insulin dependent diabetes mellitus
18143	C109G	Non-insulin dependent diabetes mellitus with arthropathy
18209	C1090	Non-insulin-dependent diabetes mellitus with renal comps
18219	C109.	Non-insulin dependent diabetes mellitus
18230	C108J	Insulin dependent diab mell with neuropathic arthropathy
18264	C109J	Insulin treated Type 2 diabetes mellitus
18278	C109J	Insulin treated Type 2 diabetes mellitus
18387	C10E7	Type 1 diabetes mellitus with retinopathy
18390	C10FM	Type 2 diabetes mellitus with persistent microalbuminuria
18425	C10FB	Type 2 diabetes mellitus with polyneuropathy
18496	C10F6	Type 2 diabetes mellitus with retinopathy
18505	C108.	Insulin dependent diabetes mellitus
18642	C10EH	Type 1 diabetes mellitus with arthropathy
18683	C10E5	Type 1 diabetes mellitus with ulcer
18777	C10F0	Type 2 diabetes mellitus with renal complications
21482	C102.	Diabetes mellitus with hyperosmolar coma
21983	C1080	Insulin-dependent diabetes mellitus with renal complications
22487	C10N.	Secondary diabetes mellitus
22573	C106z	Diabetes mellitus NOS with neurological manifestation
22871	C10EP	Type 1 diabetes mellitus with exudative maculopathy
22884	C10F.	Type 2 diabetes mellitus
24035	E0314	Subacute confusional state, of cerebrovascular origin
24423	C108.	Insulin dependent diabetes mellitus
24458	C1097	Non-insulin dependent diabetes mellitus - poor control
24490	C1000	Diabetes mellitus, juvenile type, no mention of complication
24571	F3722	Asymptomatic diabetic neuropathy
24693	C109G	Non-insulin dependent diabetes mellitus with arthropathy
24694	C108B	Insulin dependent diabetes mellitus with mononeuropathy
24836	C109C	Non-insulin dependent diabetes mellitus with nephropathy
25114	E0304	Acute confusional state, of cerebrovascular origin
25591	C10FQ	Type 2 diabetes mellitus with exudative maculopathy

25627	C10F7	Type 2 diabetes mellitus - poor control
26054	C10FL	Type 2 diabetes mellitus with persistent proteinuria
26108	C10B0	Steroid induced diabetes mellitus without complication
26855	C1084	Unstable insulin dependent diabetes mellitus
29979	C1099	Non-insulin-dependent diabetes mellitus without complication
30294	C10EL	Type 1 diabetes mellitus with persistent microalbuminuria
30323	C10EK	Type 1 diabetes mellitus with persistent proteinuria
30477	F4207	High risk proliferative diabetic retinopathy
31310	C1089	Insulin dependent diabetes maturity onset
31790	F372.	Polyneuropathy in diabetes
32193	C11y0	Steroid induced diabetes
32403	C107.	Diabetes mellitus with peripheral circulatory disorder
32556	C107.	Diabetes mellitus with peripheral circulatory disorder
32627	C10FN	Type 2 diabetes mellitus with ketoacidosis
33254	C105.	Diabetes mellitus with ophthalmic manifestation
33343	C10y.	Diabetes mellitus with other specified manifestation
33807	C1072	Diabetes mellitus, adult with gangrene
33969	C10A1	Malnutrition-related diabetes mellitus with ketoacidosis
34268	C10F2	Type 2 diabetes mellitus with neurological complications
34283	C105z	Diabetes mellitus NOS with ophthalmic manifestation
34450	C10FK	Hyperosmolar non-ketotic state in type 2 diabetes mellitus
34912	C1094	Non-insulin dependent diabetes mellitus with ulcer
35105	C1041	Diabetes mellitus, adult onset, with renal manifestation
35107	C104z	Diabetes mellitus with nephropathy NOS
35288	C10E8	Type 1 diabetes mellitus - poor control
35385	C10FH	Type 2 diabetes mellitus with neuropathic arthropathy
35399	C107.	Diabetes mellitus with peripheral circulatory disorder
35785	F3721	Chronic painful diabetic neuropathy
36633	C109K	Hyperosmolar non-ketotic state in type 2 diabetes mellitus
36695	C10D.	Diabetes mellitus autosomal dominant type 2
37315	F3y0.	Diabetic mononeuropathy
37648	C109J	Insulin treated Type 2 diabetes mellitus
37806	C10FF	Type 2 diabetes mellitus with peripheral angiopathy
37957	C10K.	Type A insulin resistance
38161	C1087	Insulin dependent diabetes mellitus with retinopathy
38617	C101y	Other specified diabetes mellitus with ketoacidosis
38986	C100.	Diabetes mellitus with no mention of complication
39070	C10EE	Type 1 diabetes mellitus with hypoglycaemic coma
39317	C1061	Diabetes mellitus, adult onset, + neurological manifestation
39420	F3813	Myasthenic syndrome due to diabetic amyotrophy
39809	C108J	Insulin dependent diab mell with neuropathic arthropathy
40023	C1020	Diabetes mellitus, juvenile type, with hyperosmolar coma
40401	C1095	Non-insulin dependent diabetes mellitus with gangrene
40682	C10E9	Type 1 diabetes mellitus maturity onset

40837	C10EN	Type 1 diabetes mellitus with ketoacidotic coma
40962	C109H	Non-insulin dependent d m with neuropathic arthropathy
41049	C1087	Insulin dependent diabetes mellitus with retinopathy
41389	C1051	Diabetes mellitus, adult onset, + ophthalmic manifestation
41686	Cyu20	[X]Other specified diabetes mellitus
41716	C108C	Insulin dependent diabetes mellitus with polyneuropathy
42505	C101z	Diabetes mellitus NOS with ketoacidosis
42567	C1030	Diabetes mellitus, juvenile type, with ketoacidotic coma
42729	C108E	Insulin dependent diabetes mellitus with hypoglycaemic coma
42762	C1096	Non-insulin-dependent diabetes mellitus with retinopathy
42831	C10E2	Type 1 diabetes mellitus with neurological complications
43139	C1021	Diabetes mellitus, adult onset, with hyperosmolar coma
43227	C10F3	Type 2 diabetes mellitus with multiple complications
43453	C10C.	Diabetes mellitus autosomal dominant
43785	C109D	Non-insulin dependent diabetes mellitus with hypoglyca coma
43857	C10M.	Lipoatrophic diabetes mellitus
43921	C10E4	Unstable type 1 diabetes mellitus
44033	F3450	Diabetic mononeuritis multiplex
44260	C108F	Insulin dependent diabetes mellitus with diabetic cataract
44440	C108E	Insulin dependent diabetes mellitus with hypoglycaemic coma
44443	C1085	Insulin dependent diabetes mellitus with ulcer
44779	C109E	Non-insulin depend diabetes mellitus with diabetic cataract
44982	C10FE	Type 2 diabetes mellitus with diabetic cataract
45276	C10E3	Type 1 diabetes mellitus with multiple complications
45467	C109B	Non-insulin dependent diabetes mellitus with polyneuropathy
45491	C10z.	Diabetes mellitus with unspecified complication
45913	C1097	Non-insulin dependent diabetes mellitus - poor control
45914	C1088	Insulin dependent diabetes mellitus - poor control
45919	C1092	Non-insulin-dependent diabetes mellitus with neuro comps
46150	C1095	Non-insulin dependent diabetes mellitus with gangrene
46290	C108y	Other specified diabetes mellitus with multiple comps
46301	C10EC	Type 1 diabetes mellitus with polyneuropathy
46624	C10C.	Diabetes mellitus autosomal dominant
46850	C1088	Insulin dependent diabetes mellitus - poor control
46917	C10FD	Type 2 diabetes mellitus with hypoglycaemic coma
46963	C1080	Insulin-dependent diabetes mellitus with renal complications
47315	C10F7	Type 2 diabetes mellitus - poor control
47321	C10F1	Type 2 diabetes mellitus with ophthalmic complications
47377	C105y	Other specified diabetes mellitus with ophthalmic complicatn
47409	C109B	Non-insulin dependent diabetes mellitus with polyneuropathy
47582	C10E0	Type 1 diabetes mellitus with renal complications
47584	F4205	Advanced diabetic retinal disease
47649	C10E1	Type 1 diabetes mellitus with ophthalmic complications
47650	C10E3	Type 1 diabetes mellitus with multiple complications

47816	C109H	Non-insulin dependent d m with neuropathic arthropathy
47954	C10F9	Type 2 diabetes mellitus without complication
48078	F3720	Acute painful diabetic neuropathy
48192	C109E	Non-insulin depend diabetes mellitus with diabetic cataract
49074	C10F4	Type 2 diabetes mellitus with ulcer
49146	C1082	Insulin-dependent diabetes mellitus with neurological comps
49276	C1081	Insulin-dependent diabetes mellitus with ophthalmic comps
49554	C10EF	Type 1 diabetes mellitus with diabetic cataract
49655	C10F6	Type 2 diabetes mellitus with retinopathy
49869	C109G	Non-insulin dependent diabetes mellitus with arthropathy
49949	C10E4	Unstable type 1 diabetes mellitus
50225	C1090	Non-insulin-dependent diabetes mellitus with renal comps
50429	C1091	Non-insulin-dependent diabetes mellitus with ophthalm comps
50527	C10FB	Type 2 diabetes mellitus with polyneuropathy
50609	L1806	Pre-existing diabetes mellitus, non-insulin-dependent
50813	C109A	Non-insulin dependent diabetes mellitus with mononeuropathy
50960	L1805	Pre-existing diabetes mellitus, insulin-dependent
50972	C100z	Diabetes mellitus NOS with no mention of complication
51261	C10E.	Type 1 diabetes mellitus
51697	C10G.	Secondary pancreatic diabetes mellitus
51756	C10FP	Type 2 diabetes mellitus with ketoacidotic coma
51957	C1085	Insulin dependent diabetes mellitus with ulcer
52104	C1083	Insulin dependent diabetes mellitus with multiple complicatn
52236	C10A.	Malnutrition-related diabetes mellitus
52283	C1082	Insulin-dependent diabetes mellitus with neurological comps
52303	C1090	Non-insulin-dependent diabetes mellitus with renal comps
53200	C1010	Diabetes mellitus, juvenile type, with ketoacidosis
53392	C10F9	Type 2 diabetes mellitus without complication
54008	C10EJ	Type 1 diabetes mellitus with neuropathic arthropathy
54212	C109F	Non-insulin-dependent d m with peripheral angiopath
54600	C10E4	Unstable type 1 diabetes mellitus
54856	C1011	Diabetes mellitus, adult onset, with ketoacidosis
54899	C109F	Non-insulin-dependent d m with peripheral angiopath
55075	C1094	Non-insulin dependent diabetes mellitus with ulcer
55239	C10EQ	Type 1 diabetes mellitus with gastroparesis
55842	C1092	Non-insulin-dependent diabetes mellitus with neuro comps
56268	C109D	Non-insulin dependent diabetes mellitus with hypoglyca coma
56448	C108A	Insulin-dependent diabetes without complication
56803	C1074	NIDDM with peripheral circulatory disorder
56885	C10K0	Type A insulin resistance without complication
57278	C10F0	Type 2 diabetes mellitus with renal complications
57621	C108D	Insulin dependent diabetes mellitus with nephropathy
58604	C1096	Non-insulin-dependent diabetes mellitus with retinopathy
59253	C10FG	Type 2 diabetes mellitus with arthropathy

59288	C103y	Other specified diabetes mellitus with coma
59365	C109C	Non-insulin dependent diabetes mellitus with nephropathy
59725	C1091	Non-insulin-dependent diabetes mellitus with ophthalm comps
59903	C106.	Diabetes mellitus with neurological manifestation
59991	C10D.	Diabetes mellitus autosomal dominant type 2
60107	C1084	Unstable insulin dependent diabetes mellitus
60208	C108J	Insulin dependent diab mell with neuropathic arthropathy
60499	C1086	Insulin dependent diabetes mellitus with gangrene
60699	C109F	Non-insulin-dependent d m with peripheral angiopath
60796	C10FL	Type 2 diabetes mellitus with persistent proteinuria
61071	C109D	Non-insulin dependent diabetes mellitus with hypoglyca coma
61122	C10H.	Diabetes mellitus induced by non-steroid drugs
61344	C1080	Insulin-dependent diabetes mellitus with renal complications
61523	C106y	Other specified diabetes mellitus with neurological comps
61829	C1082	Insulin-dependent diabetes mellitus with neurological comps
62107	C1095	Non-insulin dependent diabetes mellitus with gangrene
62146	C1093	Non-insulin-dependent diabetes mellitus with multiple comps
62209	C10EM	Type 1 diabetes mellitus with ketoacidosis
62352	C108H	Insulin dependent diabetes mellitus with arthropathy
62613	C10EA	Type 1 diabetes mellitus without complication
62674	C10FA	Type 2 diabetes mellitus with mononeuropathy
63017	C1089	Insulin dependent diabetes maturity onset
63357	C1071	Diabetes mellitus, adult, + peripheral circulatory disorder
63371	C10y1	Diabetes mellitus, adult, + other specified manifestation
63690	C10FR	Type 2 diabetes mellitus with gastroparesis
63762	C10z1	Diabetes mellitus, adult onset, + unspecified complication
64283	C10zy	Other specified diabetes mellitus with unspecified comps
64357	C10zz	Diabetes mellitus NOS with unspecified complication
64446	C108G	Insulin dependent diab mell with peripheral angiopathy
64449	C108z	Unspecified diabetes mellitus with multiple complications
64571	C109C	Non-insulin dependent diabetes mellitus with nephropathy
64668	C10FJ	Insulin treated Type 2 diabetes mellitus
65025	C107z	Diabetes mellitus NOS with peripheral circulatory disorder
65062	C103z	Diabetes mellitus NOS with ketoacidotic coma
65267	C10F3	Type 2 diabetes mellitus with multiple complications
65463	F4208	High risk non proliferative diabetic retinopathy
65616	C108H	Insulin dependent diabetes mellitus with arthropathy
65704	C1094	Non-insulin dependent diabetes mellitus with ulcer
66145	C10EN	Type 1 diabetes mellitus with ketoacidotic coma
66675	C10A0	Malnutrition-related diabetes mellitus with coma
66872	C108D	Insulin dependent diabetes mellitus with nephropathy
66965	C109H	Non-insulin dependent d m with neuropathic arthropathy
67212	C10H0	DM induced by non-steroid drugs without complication
67853	C1060	Diabetes mellitus, juvenile, + neurological manifestation

67905	C1092	Non-insulin-dependent diabetes mellitus with neuro comps
68105	C10EB	Type 1 diabetes mellitus with mononeuropathy
68390	C1085	Insulin dependent diabetes mellitus with ulcer
68517	C10J.	Insulin autoimmune syndrome
68792	C10z0	Diabetes mellitus, juvenile type, + unspecified complication
68843	C1031	Diabetes mellitus, adult onset, with ketoacidotic coma
69124	C1073	IDDM with peripheral circulatory disorder
69278	C109E	Non-insulin depend diabetes mellitus with diabetic cataract
69676	C10EA	Type 1 diabetes mellitus without complication
69748	C1050	Diabetes mellitus, juvenile type, + ophthalmic manifestation
69993	C10E6	Type 1 diabetes mellitus with gangrene
70316	C1091	Non-insulin-dependent diabetes mellitus with ophthalm comps
70448	C1070	Diabetes mellitus, juvenile +peripheral circulatory disorder
70766	C108E	Insulin dependent diabetes mellitus with hypoglycaemic coma
70821	C10yz	Diabetes mellitus NOS with other specified manifestation
72320	C109A	Non-insulin dependent diabetes mellitus with mononeuropathy
72345	C102z	Diabetes mellitus NOS with hyperosmolar coma
72702	C10E8	Type 1 diabetes mellitus - poor control
85991	C10FM	Type 2 diabetes mellitus with persistent microalbuminuria
91646	C10F4	Type 2 diabetes mellitus with ulcer
91942	C10E3	Type 1 diabetes mellitus with multiple complications
91943	C10EC	Type 1 diabetes mellitus with polyneuropathy
93380	C10N1	Cystic fibrosis related diabetes mellitus
93468	C10EG	Type 1 diabetes mellitus with peripheral angiopathy
93727	C10FE	Type 2 diabetes mellitus with diabetic cataract
93875	C10E7	Type 1 diabetes mellitus with retinopathy
93878	C10E5	Type 1 diabetes mellitus with ulcer
93922	C1040	Diabetes mellitus, juvenile type, with renal manifestation
94383	C10N0	Secondary diabetes mellitus without complication
95343	C10E7	Type 1 diabetes mellitus with retinopathy
95351	C10FA	Type 2 diabetes mellitus with mononeuropathy
95539	C10FS	Maternally inherited diabetes mellitus
95636	C10ER	Latent autoimmune diabetes mellitus in adult
95992	C108A	Insulin-dependent diabetes without complication
96235	C10E9	Type 1 diabetes mellitus maturity onset
96506	C10G0	Secondary pancreatic diabetes mellitus without complication
97446	C1089	Insulin dependent diabetes maturity onset
97474	C1084	Unstable insulin dependent diabetes mellitus
97849	C10E9	Type 1 diabetes mellitus maturity onset
97894	C10EP	Type 1 diabetes mellitus with exudative maculopathy
98071	C10E1	Type 1 diabetes mellitus with ophthalmic complications
98392	C10C.	Diabetes mellitus autosomal dominant
98616	C10F2	Type 2 diabetes mellitus with neurological complications
98704	C10E5	Type 1 diabetes mellitus with ulcer

98723	C10FD	Type 2 diabetes mellitus with hypoglycaemic coma
99231	C108B	Insulin dependent diabetes mellitus with mononeuropathy
99311	C10E1	Type 1 diabetes mellitus with ophthalmic complications
99716	C10EE	Type 1 diabetes mellitus with hypoglycaemic coma
99719	C10EA	Type 1 diabetes mellitus without complication
100292	Cyu23	[X]Unspecified diabetes mellitus with renal complications
100347	C10A5	Malnutritn-relat diabetes melitus wth periph circul complctn
100770	C10EF	Type 1 diabetes mellitus with diabetic cataract
100964	C10F1	Type 2 diabetes mellitus with ophthalmic complications
101311	C10EC	Type 1 diabetes mellitus with polyneuropathy
101735	C10E2	Type 1 diabetes mellitus with neurological complications
102112	C10E6	Type 1 diabetes mellitus with gangrene
102163	C10ED	Type 1 diabetes mellitus with nephropathy
102201	C10FC	Type 2 diabetes mellitus with nephropathy
102620	C10EL	Type 1 diabetes mellitus with persistent microalbuminuria
102740	C1081	Insulin-dependent diabetes mellitus with ophthalmic comps
102946	C10E0	Type 1 diabetes mellitus with renal complications
103902	C10FG	Type 2 diabetes mellitus with arthropathy
104323	C10F5	Type 2 diabetes mellitus with gangrene
104639	C10FF	Type 2 diabetes mellitus with peripheral angiopathy
105337	C10E8	Type 1 diabetes mellitus - poor control
105784	C1099	Non-insulin-dependent diabetes mellitus without complication
106061	C10FP	Type 2 diabetes mellitus with ketoacidotic coma
106528	C10FN	Type 2 diabetes mellitus with ketoacidosis
107603	C10P.	Diabetes mellitus in remission
107701	C10FK	Hyperosmolar non-ketotic state in type 2 diabetes mellitus
107824	C10P1	Type II diabetes mellitus in remission
108005	C1093	Non-insulin-dependent diabetes mellitus with multiple comps
108007	C1083	Insulin dependent diabetes mellitus with multiple complicatn
108360	C10P0	Type I diabetes mellitus in remission
108724	C10EQ	Type 1 diabetes mellitus with gastroparesis
109051	C10E6	Type 1 diabetes mellitus with gangrene
109103	C1099	Non-insulin-dependent diabetes mellitus without complication
109133	L1807	Pre-existing malnutrition-related diabetes mellitus
109197	C10FH	Type 2 diabetes mellitus with neuropathic arthropathy
109628	C10P0	Type I diabetes mellitus in remission
109837	C10E0	Type 1 diabetes mellitus with renal complications
109865	C109B	Non-insulin dependent diabetes mellitus with polyneuropathy
110400	C108F	Insulin dependent diabetes mellitus with diabetic cataract
110611	C10P1	Type II diabetes mellitus in remission
110997	C10y0	Diabetes mellitus, juvenile, + other specified manifestation
111106	C108A	Insulin-dependent diabetes without complication

## 12.11 Codes for hypertension

Medcode	Read code	Read term
204	G2...	Hypertensive disease
351	G20..	Essential hypertension
799	G20..	Essential hypertension
1894	G201.	Benign essential hypertension
3712	G20z.	Essential hypertension NOS
4372	G202.	Systolic hypertension
4668	G22..	Hypertensive renal disease
7057	G2z..	Hypertensive disease NOS
7329	G24..	Secondary hypertension
8732	G2...	Hypertensive disease
8857	G21z0	Hypertensive heart disease NOS without CCF
10818	G20z.	Essential hypertension NOS
15106	G22z.	Hypertensive renal disease NOS
15377	G200.	Malignant essential hypertension
16059	G24z.	Secondary hypertension NOS
16173	G21zz	Hypertensive heart disease NOS
16292	G21..	Hypertensive heart disease
17434	G22..	Hypertensive renal disease
18765	G2y..	Other specified hypertensive disease
21837	G232.	Hypertensive heart&renal dis wth (congestive) heart failure
25371	G2410	Secondary benign renovascular hypertension
28684	G233.	Hypertensive heart and renal disease with renal failure
29310	G22z.	Hypertensive renal disease NOS
31341	G24z1	Hypertension secondary to drug
31387	G24z0	Secondary renovascular hypertension NOS
31464	G21z.	Hypertensive heart disease NOS
31755	G240.	Secondary malignant hypertension
32423	G222.	Hypertensive renal disease with renal failure
32976	61462	Hypertension induced by oral contraceptive pill
34744	G244.	Hypertension secondary to endocrine disorders
39649	G220.	Malignant hypertensive renal disease
42229	G24zz	Secondary hypertension NOS
43935	G221.	Benign hypertensive renal disease
50157	G210.	Malignant hypertensive heart disease
51635	G241z	Secondary benign hypertension NOS
52127	G2111	Benign hypertensive heart disease with CCF
52427	G211.	Benign hypertensive heart disease
57288	G241.	Secondary benign hypertension
57987	G234.	Hyperten heart&renal dis+both(congestv)heart and renal fail
59383	G2400	Secondary malignant renovascular hypertension
60655	L1280	Pre-exist hyperten heart dis compl preg childbth+puerperium
61166	G21z0	Hypertensive heart disease NOS without CCF
61660	G2110	Benign hypertensive heart disease without CCF



62718	G21z1	Hypertensive heart disease NOS with CCF
63000	G231.	Benign hypertensive heart and renal disease
63466	G23..	Hypertensive heart and renal disease
64127	L1210	Renal hypertension in pregnancy/childbirth/puerp unspecified
67232	G230.	Malignant hypertensive heart and renal disease
68659	G23z.	Hypertensive heart and renal disease NOS
69753	Gyu2.	[X]Hypertensive diseases
71717	L1211	Renal hypertension in pregnancy/childbirth/puerp - delivered
72668	G2101	Malignant hypertensive heart disease with CCF
73293	G240z	Secondary malignant hypertension NOS
83473	G203.	Diastolic hypertension
93143	L121.	Renal hypertension in pregnancy/childbirth/puerperium
94718	L121z	Renal hypertension in pregnancy/childbirth/puerperium NOS
95334	G2100	Malignant hypertensive heart disease without CCF
97349	L1213	Renal hypertension in preg/childbirth/puerp - not delivered
97533	Gyu21	[X]Hypertension secondary to other renal disorders
98230	67H8.	Lifestyle advice regarding hypertension
102458	Gyu20	[X]Other secondary hypertension
103046	G210z	Malignant hypertensive heart disease NOS
105274	G28..	Stage 2 hypertension (NICE - Nat Ins for Hth Clin Excl 2011)
105316	G25..	Stage 1 hypertension (NICE - Nat Ins for Hth Clin Excl 2011)
105371	G25..	Stage 1 hypertension (NICE - Nat Ins for Hth Clin Excl 2011)
105480	G27..	Hypertension resistant to drug therapy
105487	G26..	Severe hypertension (Nat Inst for Health Clinical Ex 2011)
105938	G211z	Benign hypertensive heart disease NOS
105989	G26..	Severe hypertension (Nat Inst for Health Clinical Ex 2011)
107704	G20..	Essential hypertension
108136	G250.	Stage 1 hyperten (NICE 2011) without evidnce end organ damage
108840	L1212	Renal hypertension in preg/childb/puerp -deliv with p/n comp
109797	G251.	Stage 1 hyperten (NICE 2011) with evidnce end organ damage

## 12.12 Codes for ischaemic heart disease

Medcode	Read code	Read term
240	G3...	Ischaemic heart disease
241	G30..	Acute myocardial infarction
737	792..	Coronary artery operations
1204	G30..	Acute myocardial infarction
1344	G340.	Coronary atherosclerosis
1414	G33z3	Angina on effort
1430	G33..	Angina pectoris
1431	G311.	Preinfarction syndrome
1655	G340.	Coronary atherosclerosis
1676	G3z..	Ischaemic heart disease NOS

1677	G30..	Acute myocardial infarction
1678	G308.	Inferior myocardial infarction NOS
1792	G3...	Ischaemic heart disease
2491	G30..	Acute myocardial infarction
3704	G307.	Acute subendocardial infarction
3999	G3400	Single coronary vessel disease
4017	G32..	Old myocardial infarction
4656	G311.	Preinfarction syndrome
5030	ZV45K	[V]Presence of coronary artery bypass graft
5254	G3401	Double coronary vessel disease
5387	G301.	Other specified anterior myocardial infarction
5413	G340.	Coronary atherosclerosis
5674	ZV45K	[V]Presence of coronary artery bypass graft
5744	79275	Open angioplasty of coronary artery
5904	792..	Coronary artery operations
7320	G343.	Ischaemic cardiomyopathy
7347	G3111	Unstable angina
7696	G33z2	Syncope anginosa
7783	323..	ECG: myocardial infarction
8246	322..	ECG: myocardial ischaemia
8568	G37..	Cardiac syndrome X
8935	G302.	Acute inferolateral infarction
9276	G31y0	Acute coronary insufficiency
9413	G31y.	Other acute and subacute ischaemic heart disease
9507	G3070	Acute non-Q wave infarction
9555	G33z5	Post infarct angina
10260	6A4..	Coronary heart disease review
10562	G3071	Acute non-ST segment elevation myocardial infarction
10603	792z.	Coronary artery operations NOS
11048	G331.	Prinzmetal's angina
11648	8B3k.	Coronary heart disease medication review
11983	G3115	Acute coronary syndrome
12139	G300.	Acute anterolateral infarction
12229	G30X0	Acute ST segment elevation myocardial infarction
12627	9N0k.	Seen in heart failure clinic
12734	SP076	Coronary artery bypass graft occlusion
12804	G33z7	Stable angina
12986	G331.	Prinzmetal's angina
13185	662K.	Angina control
13187	662N.	CHD monitoring
13566	G30..	Acute myocardial infarction
13571	G30..	Acute myocardial infarction
14658	G30z.	Acute myocardial infarction NOS
14782	662K2	Angina control - improving

14897	G301z	Anterior myocardial infarction NOS
14898	G305.	Lateral myocardial infarction NOS
15349	662Kz	Angina control NOS
15373	662K1	Angina control - poor
15661	G310.	Postmyocardial infarction syndrome
15754	G34z.	Other chronic ischaemic heart disease NOS
16408	G32..	Old myocardial infarction
17133	G30A.	Mural thrombosis
17307	G3112	Angina at rest
17464	G32..	Old myocardial infarction
17689	G30..	Acute myocardial infarction
17872	G3011	Acute anteroseptal infarction
18118	G3114	Worsening angina
18125	G3300	Nocturnal angina
18135	6A2..	Coronary heart disease annual review
18643	ZV458	[V]Presence of coronary angioplasty implant and graft
18842	G35..	Subsequent myocardial infarction
18889	G34z0	Asymptomatic coronary heart disease
18913	ZV457	[V]Presence of aortocoronary bypass graft
19542	662K0	Angina control - good
19655	G311.	Preinfarction syndrome
20095	G330.	Angina decubitus
20416	G3...	Ischaemic heart disease
21844	G31y3	Transient myocardial ischaemia
22020	792B0	Endarterectomy of coronary artery NEC
22383	G3y..	Other specified ischaemic heart disease
23078	G34y1	Chronic myocardial ischaemia
23579	G310.	Postmyocardial infarction syndrome
23708	G361.	Atrial septal defect/curr comp folow acut myocardal infarct
23892	G304.	Posterior myocardial infarction NOS
24126	G360.	Haemopericardium/current comp folow acut myocard infarct
24540	G34y0	Chronic coronary insufficiency
24783	G3...	Ischaemic heart disease
25842	G33z.	Angina pectoris NOS
26863	G33z6	New onset angina
27951	G31..	Other acute and subacute ischaemic heart disease
27977	G31yz	Other acute and subacute ischaemic heart disease NOS
28138	G34..	Other chronic ischaemic heart disease
28554	G33zz	Angina pectoris NOS
28736	G30y0	Acute atrial infarction
29300	662K3	Angina control - worsening
29421	G344.	Silent myocardial ischaemia
29553	G366.	Thrombosis atrium,auric append&vent/curr comp foll acute MI
29643	G303.	Acute inferoposterior infarction

29758	G30X.	Acute transmural myocardial infarction of unspecified site
29902	G330z	Angina decubitus NOS
30330	G309.	Acute Q-wave infarct
30421	G30..	Acute myocardial infarction
32272	G38..	Postoperative myocardial infarction
32450	G33z4	Ischaemic chest pain
32854	G30B.	Acute posterolateral myocardial infarction
32911	9Or..	Heart failure monitoring administration
33620	792B.	Repair of coronary artery NEC
34328	G3113	Refractory angina
34633	G34y.	Other specified chronic ischaemic heart disease
34803	G30y.	Other acute myocardial infarction
35119	G501.	Post infarction pericarditis
35373	9Ob0.	Attends coronary heart disease monitoring
35713	G34yz	Other specified chronic ischaemic heart disease NOS
36423	G36..	Certain current complication follow acute myocardial infarct
36523	G311.	Preinfarction syndrome
36609	G342.	Atherosclerotic cardiovascular disease
36854	G332.	Coronary artery spasm
37657	G362.	Ventricular septal defect/current complication follow acute myocardial infarction
38609	G351.	Subsequent myocardial infarction of inferior wall
39449	G312.	Coronary thrombosis not resulting in myocardial infarction
39500	9Ob8.	Coronary heart disease monitoring check done
39655	G311.	Preinfarction syndrome
39693	G31y2	Subendocardial ischaemia
40429	G3010	Acute anteroapical infarction
41221	G30y2	Acute septal infarction
41757	7927z	Other open operation on coronary artery NOS
41835	G384.	Postoperative subendocardial myocardial infarction
45809	G350.	Subsequent myocardial infarction of anterior wall
45960	8B27.	Antianginal therapy
46017	G30yz	Other acute myocardial infarction NOS
46112	G380.	Postoperative transmural myocardial infarction anterior wall
46166	G35X.	Subsequent myocardial infarction of unspecified site
46276	G381.	Postoperative transmural myocardial infarction inferior wall
54251	G311z	Preinfarction syndrome NOS
54535	G33z1	Stenocardia
55137	G3110	Myocardial infarction aborted
59032	323Z.	ECG: myocardial infarct NOS
59189	G363.	Rupture cardiac wall without haemopericardium/current complication follow acute MI
59940	G364.	Rupture chordae tendinae/current complication follow acute myocardial infarction
61072	G3110	Myocardial infarction aborted
62626	G30y1	Acute papillary muscle infarction
63467	G306.	True posterior myocardial infarction

66388	G33z0	Status anginosus
68357	G31y1	Microinfarction of heart
68748	G38z.	Postoperative myocardial infarction, unspecified
69474	G365.	Rupture papillary muscle/corr comp fol acute myocard infarct
72562	G353.	Subsequent myocardial infarction of other sites
95550	8H2V.	Admit ischaemic heart disease emergency
100437	9hM..	Exception reporting: myocardial infarction quality indicator
101695	9hM0.	Exc myocard infarction quality indicators: informed dissent
102917	9hM1.	Exc myocar infarction quality indicators: patient unsuitable
105479	G39..	Coronary microvascular disease
106812	G383.	Postoperative transmural myocardial infarction unspec site

## 12.13 Codes for heart failure

Medcode	Read code	Read term
398	G580.	Congestive heart failure
884	G581.	Left ventricular failure
1223	G58..	Heart failure
2062	G58..	Heart failure
2906	G580.	Congestive heart failure
4024	G58z.	Heart failure NOS
5255	G5810	Acute left ventricular failure
5942	G581.	Left ventricular failure
9524	G580.	Congestive heart failure
9913	1O1..	Heart failure confirmed
10079	G580.	Congestive heart failure
10154	G580.	Congestive heart failure
11424	G5803	Compensated cardiac failure
12590	G58z.	Heart failure NOS
13189	662g.	New York Heart Association classification - class II
17278	G58z.	Heart failure NOS
17851	8HBE.	Heart failure follow-up
18853	662f.	New York Heart Association classification - class I
19066	662h.	New York Heart Association classification - class III
23481	G581.	Left ventricular failure
23707	G5800	Acute congestive heart failure
27884	G5802	Decompensated cardiac failure
27964	G582.	Acute heart failure
32671	G5801	Chronic congestive heart failure
32898	8H2S.	Admit heart failure emergency
43618	G581.	Left ventricular failure
51214	662i.	New York Heart Association classification - class IV
52127	G2111	Benign hypertensive heart disease with CCF
62718	G21z1	Hypertensive heart disease NOS with CCF
94870	G5804	Congestive heart failure due to valvular disease
96799	G5y4z	Post cardiac operation heart failure NOS
101137	G583.	Heart failure with normal ejection fraction
101138	G583.	Heart failure with normal ejection fraction
106897	G583.	Heart failure with normal ejection fraction

## 12.14 Codes for depression/anxiety

Medcode	Read code	Read_term
131	1B13.	Anxiousness
324	E2B..	Depressive disorder NEC
462	E2001	Panic disorder
514	1B12.	Nerves - nervousness
543	Eu32z	[X]Depressive episode, unspecified
595	E112.	Single major depressive episode
636	E200.	Anxiety states
655	E2003	Anxiety with depression
1055	E135.	Agitated depression
1131	E204.	Neurotic depression reactive type
1510	E202B	Cancer phobia
1533	E290.	Brief depressive reaction
1723	E2028	Claustrophobia
1758	E2004	Chronic anxiety
1907	E202.	Phobic disorders
2300	E2020	Phobia unspecified
2366	E202C	Dental phobia
2571	Eu400	[X]Agoraphobia
2639	E204.	Neurotic depression reactive type
2775	E2900	Grief reaction
2923	62T1.	Puerperal depression
2970	Eu32z	[X]Depressive episode, unspecified
3076	E2021	Agoraphobia with panic attacks
3208	E203.	Obsessive-compulsive disorders
3291	Eu32z	[X]Depressive episode, unspecified
3292	Eu33.	[X]Recurrent depressive disorder
3328	1B1..	General nervous symptoms
3347	E2D..	Disturbance of emotion specific to childhood and adolescence
3489	E11z1	Rebound mood swings
3586	1B12.	Nerves - nervousness
3702	E114.	Bipolar affective disorder, currently manic
4069	E2001	Panic disorder
4081	Eu410	[X]Panic disorder [episodic paroxysmal anxiety]
4167	E202A	Fear of flying
4323	E2B1.	Chronic depression
4377	E2751	Bulimia (non-organic overeating)
4534	E200z	Anxiety state NOS
4634	E2005	Recurrent anxiety
4639	Eu32.	[X]Depressive episode
4659	E2002	Generalised anxiety disorder
4677	E115.	Bipolar affective disorder, currently depressed

4732	Eu315	[X]Bipolar affect dis cur epi severe depres with psyc symp
4872	E2Dy1	Childhood and adolescent identity disorder
5347	1B1H.	Frightened
5678	E2030	Compulsive neurosis
5879	E112.	Single major depressive episode
5902	1B13.	Anxiousness
5987	Eu32z	[X]Depressive episode, unspecified
6071	E202E	Fear of pregnancy
6408	Eu410	[X]Panic disorder [episodic paroxysmal anxiety]
6482	E1137	Recurrent depression
6546	E112.	Single major depressive episode
6854	Eu32y	[X]Other depressive episodes
6932	E113.	Recurrent major depressive episode
6939	E2000	Anxiety state unspecified
6950	E112.	Single major depressive episode
7011	E112z	Single major depressive episode NOS
7222	Eu40z	[X]Phobic anxiety disorder, unspecified
7394	E2Dz.	Childhood and adolescent emotion disorder NOS
7604	Eu32.	[X]Depressive episode
7716	E29y3	Elective mutism due to an adjustment reaction
7737	Eu341	[X]Dysthymia
7749	Eu412	[X]Mixed anxiety and depressive disorder
7953	Eu341	[X]Dysthymia
8205	Eu410	[X]Panic disorder [episodic paroxysmal anxiety]
8478	E130.	Reactive depressive psychosis
8584	Eu341	[X]Dysthymia
8826	Eu33.	[X]Recurrent depressive disorder
8851	Eu33.	[X]Recurrent depressive disorder
8902	Eu33.	[X]Recurrent depressive disorder
8928	1BT..	Depressed mood
9055	Eu32.	[X]Depressive episode
9125	8G94.	Anxiety management training
9183	E11z2	Masked depression
9211	Eu321	[X]Moderate depressive episode
9386	Eu40.	[X]Phobic anxiety disorders
9667	Eu322	[X]Severe depressive episode without psychotic symptoms
9785	Eu402	[X]Specific (isolated) phobias
9944	E202.	Phobic disorders
10015	1BT..	Depressed mood
10290	Eu341	[X]Dysthymia
10390	E202D	Fear of death
10455	E2112	Depressive personality disorder
10610	E112.	Single major depressive episode
10720	Eu32y	[X]Other depressive episodes



10734	E2900	Grief reaction
10825	E118.	Seasonal affective disorder
11252	Eu332	[X]Recurr depress disorder cur epi severe without psyc sympt
11280	Eu402	[X]Specific (isolated) phobias
11329	Eu332	[X]Recurr depress disorder cur epi severe without psyc sympt
11596	E11y0	Unspecified manic-depressive psychoses
11602	Eu401	[X]Social phobias
11608	E2751	Bulimia (non-organic overeating)
11717	Eu320	[X]Mild depressive episode
11913	Eu412	[X]Mixed anxiety and depressive disorder
12099	Eu323	[X]Severe depressive episode with psychotic symptoms
12122	9H91.	Depression medication review
12399	9H90.	Depression annual review
12508	Eu403	[X]Needle phobia
12635	Eu402	[X]Specific (isolated) phobias
12707	E2113	Cyclothymic personality disorder
12831	E115.	Bipolar affective disorder, currently depressed
12838	E2022	Agoraphobia without mention of panic attacks
14709	E1132	Recurrent major depressive episodes, moderate
14728	E1101	Single manic episode, mild
14729	E202z	Phobic disorder NOS
14784	E117.	Unspecified bipolar affective disorder
14890	Eu400	[X]Agoraphobia
14979	E211.	Affective personality disorder
15099	E113.	Recurrent major depressive episode
15155	E1122	Single major depressive episode, moderate
15219	E1123	Single major depressive episode, severe, without psychosis
15220	Eu341	[X]Dysthymia
15292	E2620	Cardiac neurosis
15923	E1150	Bipolar affective disorder, currently depressed, unspecified
16199	E2023	Social phobia, fear of eating in public
16347	E1143	Bipolar affect disord, currently manic, severe, no psychosis
16415	E293.	Adjustment reaction with predominant disturbance of conduct
16506	E1121	Single major depressive episode, mild
16562	Eu313	[X]Bipolar affect disorder cur epi mild or moderate depressn
16638	E202.	Phobic disorders
16729	Eu400	[X]Agoraphobia
16808	Eu310	[X]Bipolar affective disorder, current episode hypomanic
16817	E2D..	Disturbance of emotion specific to childhood and adolescence
16861	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
17023	E2D20	Childhood and adolescent disturbance with shyness
17385	E114.	Bipolar affective disorder, currently manic
17687	Eu515	[X]Nightmares
17770	E130.	Reactive depressive psychosis

18248	Eu402	[X]Specific (isolated) phobias
18510	Eu32.	[X]Depressive episode
18603	E2025	Social phobia, fear of public washing
19129	1B1H.	Frightened
19696	Eu33.	[X]Recurrent depressive disorder
19921	E29y5	Other adjustment reaction with withdrawal
20089	1B1Z.	General nervous symptom NOS
20110	E1100	Single manic episode, unspecified
20163	1B1H.	Frightened
20773	Eu054	[X]Organic anxiety disorder
21222	E2D1.	Childhood and adolescence disturbance of unhappiness
22683	1Bb0.	Fear of falling
22806	Eu322	[X]Severe depressive episode without psychotic symptoms
23462	E29yz	Other adjustment reactions NOS
23713	Eu314	[X]Bipol aff disord, curr epis sev depress, no psychot symp
23731	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
23838	Eu41z	[X]Anxiety disorder, unspecified
23881	E2Dy0	Childhood and adolescent oppositional disorder
24066	Eu41y	[X]Other specified anxiety disorders
24112	Eu323	[X]Severe depressive episode with psychotic symptoms
24117	Eu323	[X]Severe depressive episode with psychotic symptoms
24171	E1134	Recurrent major depressive episodes, severe, with psychosis
24212	E292.	Adjustment reaction, predominant disturbance other emotions
24230	E1176	Unspecified bipolar affective disorder, in full remission
24351	Eu931	[X]Phobic anxiety disorder of childhood
24640	E1102	Single manic episode, moderate
24689	E1161	Mixed bipolar affective disorder, mild
25074	E2D1.	Childhood and adolescence disturbance of unhappiness
25563	E113z	Recurrent major depressive episode NOS
25638	Eu41z	[X]Anxiety disorder, unspecified
25697	E1133	Recurrent major depressive episodes, severe, no psychosis
26028	1BT..	Depressed mood
26299	Eu311	[X]Bipolar affect disorder cur epi manic wout psychotic symp
27491	E11y2	Atypical depressive disorder
27584	Eu317	[X]Bipolar affective disorder, currently in remission
27758	E2D1.	Childhood and adolescence disturbance of unhappiness
27890	E1152	Bipolar affective disorder, currently depressed, moderate
27986	E117z	Unspecified bipolar affective disorder, NOS
28106	E2026	Acrophobia
28167	Eu41y	[X]Other specified anxiety disorders
28248	Eu32z	[X]Depressive episode, unspecified
28277	Eu312	[X]Bipolar affect disorder cur epi manic with psychotic symp
28677	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
28756	Eu33.	[X]Recurrent depressive disorder

28863	Eu323	[X]Severe depressive episode with psychotic symptoms
28925	8HHp.	Referral for guided self-help for anxiety
28938	E2027	Animal phobia
29322	E201B	Compensation neurosis
29342	E1131	Recurrent major depressive episodes, mild
29451	Eu332	[X]Recurr depress disorder cur epi severe without psyc sympt
29520	Eu331	[X]Recurrent depressive disorder, current episode moderate
29608	1B12.	Nerves - nervousness
29907	Eu932	[X]Social anxiety disorder of childhood
30031	E2D2.	Childhood and adolescent disturbance with sensitivity
30405	9H92.	Depression interim review
30483	8CAa.	Patient given advice about management of depression
30583	9k4..	Depression - enhanced services administration
31316	E116.	Mixed bipolar affective disorder
31522	E2D0.	Disturbance of anxiety and fearfulness childhood/adolescent
31535	E1160	Mixed bipolar affective disorder, unspecified
31672	E2029	Fear of crowds
31757	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
31940	E2D..	Disturbance of emotion specific to childhood and adolescence
31957	E2024	Social phobia, fear of public speaking
32159	E1124	Single major depressive episode, severe, with psychosis
32841	8HHq.	Referral for guided self-help for depression
32941	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
33425	E11zz	Other affective psychosis NOS
33426	E11yz	Other and unspecified manic-depressive psychoses NOS
33469	Eu332	[X]Recurr depress disorder cur epi severe without psyc sympt
33751	Eu31z	[X]Bipolar affective disorder, unspecified
34064	Eu40z	[X]Phobic anxiety disorder, unspecified
34390	E1120	Single major depressive episode, unspecified
35594	E2D0z	Disturbance anxiety and fearfulness childhood/adolescent NOS
35607	E1153	Bipolar affect disord, now depressed, severe, no psychosis
35611	E2D21	Childhood and adolescent disturbance with introversion
35619	E2D00	Childhood and adolescent overanxiousness disturbance
35632	E29y2	Adjustment reaction with physical symptoms
35671	E1130	Recurrent major depressive episodes, unspecified
35734	E1151	Bipolar affective disorder, currently depressed, mild
35738	E1140	Bipolar affective disorder, currently manic, unspecified
36073	E2Dz.	Childhood and adolescent emotion disorder NOS
36126	E1141	Bipolar affective disorder, currently manic, mild
36246	E290z	Brief depressive reaction NOS
36541	E2D22	Childhood and adolescent disturbance with elective mutism
36616	Eu33z	[X]Recurrent depressive disorder, unspecified
37296	E115z	Bipolar affective disorder, currently depressed, NOS
37764	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp

38543	E202z	Phobic disorder NOS
41183	E2D20	Childhood and adolescent disturbance with shyness
41455	E29y.	Other adjustment reactions
41989	Eu322	[X]Severe depressive episode without psychotic symptoms
41992	E11z.	Other and unspecified affective psychoses
42000	E20y.	Other neurotic disorders
42788	Eu401	[X]Social phobias
42931	9HA0.	On depression register
43050	E20yz	Other neurotic disorder NOS
43093	E1103	Single manic episode, severe without mention of psychosis
43324	E1125	Single major depressive episode, partial or unspec remission
43339	Eu932	[X]Social anxiety disorder of childhood
44194	E2D2.	Childhood and adolescent disturbance with sensitivity
44300	Eu33z	[X]Recurrent depressive disorder, unspecified
44305	Eu515	[X]Nightmares
44321	Eu413	[X]Other mixed anxiety disorders
44546	E2Dz.	Childhood and adolescent emotion disorder NOS
44693	Eu316	[X]Bipolar affective disorder, current episode mixed
44848	8BK0.	Depression management programme
45603	E294.	Adjustment reaction with disturbance emotion and conduct
46415	E111z	Recurrent manic episode NOS
46434	E1142	Bipolar affective disorder, currently manic, moderate
46715	E2D1.	Childhood and adolescence disturbance of unhappiness
47009	Eu333	[X]Recurrent depress disorder cur epi severe with psyc symp
47365	E203.	Obsessive-compulsive disorders
48588	E292y	Adjustment reaction with mixed disturbance of emotion
49763	E1170	Unspecified bipolar affective disorder, unspecified
50218	E1104	Single manic episode, severe, with psychosis
51032	Eu31y	[X]Other bipolar affective disorders
51497	E211z	Affective personality disorder NOS
52678	Eu323	[X]Severe depressive episode with psychotic symptoms
53840	Eu31y	[X]Other bipolar affective disorders
54195	E1164	Mixed bipolar affective disorder, severe, with psychosis
54607	E11z0	Unspecified affective psychoses NOS
55064	E1166	Mixed bipolar affective disorder, in full remission
55384	E1136	Recurrent major depressive episodes, in full remission
55829	E1144	Bipolar affect disord, currently manic,severe with psychosis
56026	E2D01	Childhood and adolescent fearfulness disturbance
56273	E1135	Recurrent major depressive episodes,partial/unspec remission
56465	E2D22	Childhood and adolescent disturbance with elective mutism
56609	Eu32y	[X]Other depressive episodes
57409	E1126	Single major depressive episode, in full remission
57465	E1156	Bipolar affective disorder, now depressed, in full remission
57605	E114z	Bipolar affective disorder, currently manic, NOS

59011	E1145	Bipolar affect disord,currently manic, part/unspec remission
59386	Eu322	[X]Severe depressive episode without psychotic symptoms
60178	E11y.	Other and unspecified manic-depressive psychoses
63150	E1162	Mixed bipolar affective disorder, moderate
63284	E1163	Mixed bipolar affective disorder, severe, without psychosis
63583	E116z	Mixed bipolar affective disorder, NOS
63651	E1165	Mixed bipolar affective disorder, partial/unspec remission
63698	E1171	Unspecified bipolar affective disorder, mild
63701	E1154	Bipolar affect disord, now depressed, severe with psychosis
63784	E1146	Bipolar affective disorder, currently manic, full remission
67898	Eu40z	[X]Phobic anxiety disorder, unspecified
67965	Eu402	[X]Specific (isolated) phobias
68326	E1174	Unspecified bipolar affective disorder,severe with psychosis
68647	E1172	Unspecified bipolar affective disorder, moderate
70000	E1106	Single manic episode in full remission
70399	E11y3	Other mixed manic-depressive psychoses
70721	E1175	Unspecified bipolar affect disord, partial/unspec remission
71355	E27z.	Other and unspecified psychogenic syndrome NEC
72026	E1155	Bipolar affect disord, now depressed, part/unspec remission
73423	E1173	Unspecified bipolar affective disorder, severe, no psychosis
73924	Eu31y	[X]Other bipolar affective disorders
73991	Eu332	[X]Recurr depress disorder cur epi severe without psyc sympt
93401	1B13.	Anxiousness
98414	Eu327	[X]Major depression, severe without psychotic symptoms
98417	Eu328	[X]Major depression, severe with psychotic symptoms
103915	Eu319	[X]Bipolar affective disorder type II
104051	Eu319	[X]Bipolar affective disorder type II
104065	Eu318	[X]Bipolar affective disorder type I
104891	E293z	Adjustment reaction with predominant disturbance conduct NOS
107410	173f.	Anxiety about breathlessness
108107	8CAZ0	Patient given advice about management of anxiety
109485	E1105	Single manic episode in partial or unspecified remission

## 12.15 Codes for sleep disorders

Medcode	Read code	Read term
750	R0052	[D]Insomnia NOS
1244	R0050	[D]Sleep disturbance, unspecified
2129	E2749	Nightmares
2506	R0053	[D]Hypersomnia with sleep apnoea
2578	R060B	[D]Snoring
3523	1B1B0	Initial insomnia
4023	E2741	Insomnia NOS
4537	1B1B.	C/O - insomnia

4597	1B1B2	Late insomnia
5636	1C7..	Snoring symptoms
5675	1B1B1	Middle insomnia
6943	Eu513	[X]Sleepwalking
7409	E2745	Jet lag - disorder
8084	R005.	[D]Insomnia - symptom
8310	1B1B.	C/O - insomnia
8913	E2748	Sleep terrors
9536	1B1D.	Nightmares - symptom
10349	R005.	[D]Insomnia - symptom
10421	Fy01.	Disorders of excessive somnolence
10982	E2743	Hypersomnia: [transient] or [NOS]
11721	E2747	Somnambulism - sleep walking
11779	F271.	Narcoleptic syndrome
15387	1B1D.	Nightmares - symptom
15407	R005z	[D]Sleep dysfunction NOS
15515	E2741	Insomnia NOS
15732	R0056	[D]Sleep rhythm irregular
16115	E2742	Persistent insomnia
16447	R0055	[D]Sleep rhythm inversion
17687	Eu515	[X]Nightmares
19514	E274D	(Repetitive intrusions of sleep) or (restless sleep)
20438	R0053	[D]Hypersomnia with sleep apnoea
21305	1B1B.	C/O - insomnia
25939	E2744	Persistent hypersomnia
26547	R0054	[D]Hypersomnia NOS
26836	F27z.	Cataplexy or narcolepsy NOS
29370	1C72.	Snores
29641	1C7Z.	Snoring symptom NOS
30626	Eu510	[X]Nonorganic insomnia
31236	R005.	[D]Insomnia - symptom
36301	R0053	[D]Hypersomnia with sleep apnoea
36745	E274F	Reversed sleep-wake cycle
36992	E2743	Hypersomnia: [transient] or [NOS]
39990	E274B	Repeated rapid eye movement sleep interruptions
41737	R0059	[D]Sleep dysfunction with arousal disturbance
44305	Eu515	[X]Nightmares
48539	R0051	[D]Insomnia with sleep apnoea
48783	E274D	(Repetitive intrusions of sleep) or (restless sleep)
54458	R0058	[D]Sleep dysfunction with sleep stage disturbance
58911	R0057	[D]Sleep-wake rhythm non-24-hour cycle
59939	1C71.	Does not snore
68497	F27..	Cataplexy and narcolepsy

## 12.16 Codes for sleep apnea

Medcode	Read code	Read term
7603	Fy03.	Sleep apnoea
8148	Fy03.	Sleep apnoea
48539	R0051	[D]Insomnia with sleep apnoea

## 12.17 Codes for glaucoma

Medcode	Read code	Read term
1798	F451.	Open-angle glaucoma
2074	F45..	Glaucoma
4581	F4511	Primary open-angle glaucoma
8001	F45z.	Glaucoma NOS
8132	F45y2	Low tension glaucoma
9469	F4512	Low tension glaucoma
12251	F4513	Pigmentary glaucoma
18743	F4551	Pseudoexfoliation glaucoma
20520	F4520	Unspecified primary angle-closure glaucoma
22805	F4560	Glaucoma due to unspecified ocular disorder
26870	F4562	Glaucoma due to ocular inflammation
28189	F451z	Open-angle glaucoma NOS
28505	F45y.	Other specified forms of glaucoma
28536	F4522	Acute angle-closure glaucoma
28536	F4522	Acute primary angle-closure glaucoma
29764	F4421	Posner-Schlossman syndrome
30649	F4511	Primary open-angle glaucoma
34354	F455z	Glaucoma associated with disorders of the lens NOS
35446	F4523	Chronic angle-closure glaucoma
35446	F4523	Chronic primary angle-closure glaucoma
35528	F453.	Steroid-induced glaucoma
37876	F4561	Secondary angle-closure glaucoma with pupil block
39120	F452z	Primary angle-closure glaucoma NOS
41794	F4563	Glaucoma due to ocular vascular disorder
41804	F454z	Glaucoma due to disease NOS
41854	F454.	Glaucoma due to disease EC
42447	F4510	Unspecified open-angle glaucoma
44295	F45yz	Other specified glaucoma NOS
44798	F4550	Phacolytic glaucoma
48132	F453z	Steroid-induced glaucoma NOS
53521	F456z	Glaucoma associated with other ocular disorders NOS
53879	F4512	Low tension glaucoma
54262	F455.	Glaucoma with lens disorder
63660	F45y0	Hypersecretion glaucoma
64851	F4543	Glaucoma due to systemic syndrome
65193	F45y1	Glaucoma due to raised episcleral venous pressure

65193	F45y1	Glaucoma due to episode of increased venous pressure
67341	F4541	Glaucoma due to iris anomaly
67413	F4524	Primary angle-closure glaucoma residual stage
68094	F4531	Steroid-induced glaucoma residual stage
68633	F4544	Glaucoma in endocrine, nutritional and metabolic diseases
69195	F4540	Glaucoma due to chamber angle anomaly
70195	FyuG0	[X]Other glaucoma
72394	F4515	Open-angle glaucoma residual stage
98117	F4513	Pigmentary glaucoma
98647	FyuG1	[X]Glaucoma in endocrine, nutritional and metabolic diseases classified elsewhere

## 12.18 Codes for cataract

Medcode	Read code	Read term
296	F46..	Cataract
519	72670	Insertion of intraocular lens
703	F466.	Bilateral cataracts
1445	7266.	Other extraction lens (& for cataract)
1514	72654	YAG laser capsulotomy of lens
1622	22E5.	O/E - cataract present
1974	72631	Phacoemulsification of lens
2301	72631	Phacoemulsification of lens
2468	7268z	Other operation on lens NOS
2967	72653	Capsulotomy of lens NEC
4242	F4604	Posterior subcapsular polar cataract
4260	7264.	Intracapsular extraction of lens
4358	F46y.	Other cataract
4439	22E5.	O/E - cataract present
4458	7265.	Capsulotomy of lens capsule
4459	ZV456	[V]State following cataract extraction
4930	F4K34	(Thickening of lens capsule) or (posterior capsule opacification)
5325	F4617	Posterior subcapsular polar senile cataract
5361	7266.	Other extraction lens (& for cataract)
5511	7264z	Intracapsular extraction of lens NOS
6317	F46z.	Cataract NOS
6330	7263.	Extracapsular extraction of lens
6876	F4619	Nuclear senile cataract
7257	F4605	Cortical cataract
7286	72632	Aspiration of lens
7793	F4607	Nuclear cataract
10010	F461.	Age-related cataract
10659	F4640	Diabetic cataract
10706	7263.	Extracapsular extraction of lens



11255	P3311	Subcapsular cataract
14751	7266z	Other extraction of lens NOS
15589	F46yz	Other cataract NOS
17288	7265.	Capsulotomy of lens capsule
18048	F4611	Lens capsule pseudoexfoliation
18089	P3310	Capsular cataract
19119	7268y	Other specified other operation on lens
19371	F4634	Cataract in degenerative disorder
20430	7268.	Other operations on lens
22022	F4618	Cortical senile cataract
23631	F4615	Immature cataract NOS
23883	72630	Lens: [simple linear extraction] or [cataract needling]
24108	72640	Forceps extraction of lens
24113	7264.	Intracapsular extraction of lens
24467	F4650	Unspecified secondary cataract
24481	F46y0	Calcification of lens
26097	F4613	Punctate cataract
26850	F4653	After-cataract with vision obscured
28460	ZV456	[V]State following cataract extraction
29085	72630	Lens: [simple linear extraction] or [cataract needling]
29770	F461z	Senile cataract NOS
31087	72662	Mechanical lensectomy
33482	F465.	After-cataract
33793	F461A	Total, mature senile cataract
34256	72672	Removal of intraocular lens
36813	F4651	Soemmering's ring
38412	72671	Revision of intraocular lens
38487	7263z	Extracapsular extraction of lens NOS
39044	72652	Capsulotomy of posterior lens capsule
39439	7265z	Incision of capsule of lens NOS
41493	72641	Suction extraction of lens
41668	F460.	Infantile, juvenile and presenile cataracts
42452	F4K2D	Vitreous syndrome following cataract surgery
42702	7266y	Other specified other extraction of lens
44294	F46z0	Immature cortical cataract
44487	F465z	After cataract NOS
44794	F4600	Unspecified infantile cataract
45190	F4606	Lamellar zonular cataract
45316	7264y	Other specified intracapsular extraction of lens
45952	F4641	Tetanic cataract
46051	72650	Capsulectomy of lens capsule
46169	F463z	Cataract secondary to ocular disorder NOS
46427	72681	Couching of lens
47566	F4610	Unspecified senile cataract

48148	F4614	Incipient cataract NOS
48228	F463.	Cataract secondary to ocular disease
49085	F461y	Other senile cataract
49241	7263y	Other specified extracapsular extraction of lens
49297	FyuE4	[X]Cataract in other diseases classified elsewhere
50932	F4612	Coronary cataract
51162	F461B	Cataract: [hypermature] or [Morgagni]
51162	F461B	Hypermature cataract
51648	72642	Cryoextraction of lens
53825	F4K34	(Thickening of lens capsule) or (posterior capsule opacification)
54130	F4632	Cataract in eye inflammatory disorder
54975	72660	Curettage of lens
55422	7267z	Prosthesis of lens NOS
56792	72651	Capsulotomy of anterior lens capsule
57805	F4602	Unspecified presenile cataract
58078	F460z	Nonsenile cataract NOS
58120	F4644	Drug-induced cataract
58625	F4643	Cataract associated with other syndromes
59125	F4603	Anterior subcapsular polar cataract
59914	P331.	Capsular and subcapsular cataract
60883	F4642	Myotonic cataract
61325	F4633	Cataract with neovascularisation
62188	F4630	Unspecified cataracta complicata
63491	F4601	Unspecified juvenile cataract
63640	F461B	Cataract: [hypermature] or [Morgagni]
63640	F461B	Hypermature cataract
64745	7265y	Other specified incision of capsule of lens
70201	FyuE1	[X]Other specified cataract
70257	F461x	Combined senile cataract
70403	F460y	Other nonsenile cataract
71256	7267y	Other specified prosthesis of lens
71291	F464.	Cataract due to other disorder
88738	P331z	Capsular or subcapsular cataract NOS
89585	F4652	Other after cataract with vision normal
92358	F4616	Anterior subcapsular polar senile cataract
94430	F464z	Cataract due to other disorder NOS
94474	F460x	Combined nonsenile cataract
96385	P332.	Cortical and zonular cataract
98962	P332z	Cortical or zonular cataract NOS
101939	FyuE0	[X]Other senile cataract
107168	F4631	Glaucomatous subcapsular flecks

## 12.19 Codes for chronic kidney disease

Medcode	Read code	Read term
350	K06..	Renal failure unspecified
512	K05..	Chronic renal failure
4809	K06..	Renal failure unspecified
6712	K050.	End stage renal failure
6842	K060.	Renal impairment
10081	K05..	Chronic renal failure
11554	SP154	Renal failure as a complication of care
11787	K060.	Renal impairment
12479	1Z13.	Chronic kidney disease stage 4
12566	1Z12.	Chronic kidney disease stage 3
12585	1Z14.	Chronic kidney disease stage 5
21837	G232.	Hypertensive heart&renal dis wth (congestive) heart failure
22252	ZV451	[V]Renal dialysis status
24292	SP154	Renal failure as a complication of care
28684	G233.	Hypertensive heart and renal disease with renal failure
32423	G222.	Hypertensive renal disease with renal failure
39598	SP154	Renal failure as a complication of care
41013	K08y3	Renal function impairment with growth failure
47342	Q48y0	Congenital renal failure
52123	8882.	Intestinal dialysis
53852	K05..	Chronic renal failure
53940	Kyu21	[X]Other chronic renal failure
55858	SP154	Renal failure as a complication of care
57987	G234.	Hyperten heart&renal dis+both(congestv)heart and renal fail
61930	Kyu2.	[X]Renal failure
71314	L093.	Renal failure following abortive pregnancy
94793	1Z1B.	Chronic kidney disease stage 3 with proteinuria
94965	1Z15.	Chronic kidney disease stage 3A
95122	1Z1H.	Chronic kidney disease stage 4 with proteinuria
95123	1Z1C.	Chronic kidney disease stage 3 without proteinuria
95145	1Z1B.	Chronic kidney disease stage 3 with proteinuria
95175	1Z1E.	Chronic kidney disease stage 3A without proteinuria
95176	1Z1E.	Chronic kidney disease stage 3A without proteinuria
95177	1Z1G.	Chronic kidney disease stage 3B without proteinuria
95178	1Z1F.	Chronic kidney disease stage 3B with proteinuria
95179	1Z16.	Chronic kidney disease stage 3B
95180	1Z1F.	Chronic kidney disease stage 3B with proteinuria
95188	1Z1C.	Chronic kidney disease stage 3 without proteinuria
95405	1Z1L.	Chronic kidney disease stage 5 without proteinuria
95406	1Z1J.	Chronic kidney disease stage 4 without proteinuria
95508	1Z1K.	Chronic kidney disease stage 5 with proteinuria
97587	1Z1J.	Chronic kidney disease stage 4 without proteinuria
97683	1Z1L.	Chronic kidney disease stage 5 without proteinuria

99160	1Z1K.	Chronic kidney disease stage 5 with proteinuria
99312	1Z1H.	Chronic kidney disease stage 4 with proteinuria
100633	1Z1G.	Chronic kidney disease stage 3B without proteinuria
104619	K053.	Chronic kidney disease stage 3
104963	K054.	Chronic kidney disease stage 4
104981	K05..	Chronic renal failure
105151	K055.	Chronic kidney disease stage 5
107771	K06..	Renal failure unspecified
109657	1Z1Y.	CKD with GFR category G3b & albuminuria category A2
109804	1Z1T.	CKD with GFR category G3a & albuminuria category A1
109805	1Z1V.	CKD with GFR category G3a & albuminuria category A2
109884	SP0H.	Disorder associated with dialysis
109904	1Z1b.	CKD with GFR category G4 & albuminuria category A2
109905	1Z1W.	CKD with GFR category G3a & albuminuria category A3
109963	1Z1X.	CKD with GFR category G3b & albuminuria category A1
109980	1Z1a.	CKD with GFR category G4 & albuminuria category A1
109981	1Z1e.	CKD with GFR category G5 & albuminuria category A2
109990	1Z1Z.	CKD with GFR category G3b & albuminuria category A3
110003	1Z1N.	CKD with GFR category G1 & albuminuria category A2
110033	1Z1M.	CKD with GFR category G1 & albuminuria category A1
110108	1Z1R.	CKD with GFR category G2 & albuminuria category A2
110133	1Z1d.	CKD with GFR category G5 & albuminuria category A1
110251	1Z1S.	CKD with GFR category G2 & albuminuria category A3
110269	1Z1Q.	CKD with GFR category G2 & albuminuria category A1
110467	1Z1f.	CKD with GFR category G5 & albuminuria category A3
110484	1Z1P.	CKD with GFR category G1 & albuminuria category A3
110626	1Z1c.	CKD with GFR category G4 & albuminuria category A3

## 12.20 Codes for osteoporosis

Medcode	Read code	Read term
277	N330.	Osteoporosis
3346	N330B	Vertebral osteoporosis
4013	N331L	Collapse of vertebra due to osteoporosis NOS
5841	N331J	Collapse of lumbar vertebra due to osteoporosis
9700	N3302	Postmenopausal osteoporosis
11503	N331M	Fragility fracture due to unspecified osteoporosis
12673	N3319	Osteoporosis + pathological fracture thoracic vertebrae
13987	58E4.	Forearm DXA scan result osteoporotic
14967	N3300	Osteoporosis, unspecified
16307	N3301	Senile osteoporosis
16857	N330C	Osteoporosis localized to spine
17377	N3318	Osteoporosis + pathological fracture lumbar vertebrae

18825	NyuB8	[X]Unspecified osteoporosis with pathological fracture
19048	N331K	Collapse of thoracic vertebra due to osteoporosis
24093	N3305	Drug-induced osteoporosis
25650	N330D	Osteoporosis due to corticosteroids
27597	N3316	Idiopathic osteoporosis with pathological fracture
31580	N330A	Osteoporosis in endocrine disorders
33526	N3313	Osteoporosis of disuse with pathological fracture
34798	N330z	Osteoporosis NOS
38395	N331B	Postmenopausal osteoporosis with pathological fracture
39217	58EM.	Lumbar DXA scan result osteoporotic
39334	N3312	Postoophorectomy osteoporosis with pathological fracture
40428	N3303	Idiopathic osteoporosis
41755	NyuB1	[X]Other osteoporosis
42354	58EG.	Hip DXA scan result osteoporotic
45736	N331H	Collapse of cervical vertebra due to osteoporosis
46510	58EA.	Heel DXA scan result osteoporotic
46894	N3315	Drug-induced osteoporosis with pathological fracture
48772	N331A	Osteoporosis + pathological fracture cervical vertebrae
57301	NyuB0	[X]Other osteoporosis with pathological fracture
60433	N3309	Osteoporosis in multiple myelomatosis
62702	N3304	Dissuse osteoporosis
68019	N3314	Postsurgical malabsorption osteoporosis with path fracture
70349	N3306	Postoophorectomy osteoporosis
93655	N3307	Postsurgical malabsorption osteoporosis
93705	N331M	Fragility fracture due to unspecified osteoporosis
96342	58EV.	Femoral neck DEXA scan result osteoporotic
102730	NyuB2	[X]Osteoporosis in other disorders classified elsewhere

## 12.21 MRC Dyspnoea Scale

MRC Dyspnoea Scale	
Grade	Degree of breathlessness related to activity
0	Not troubled by breathless except on strenuous exercise
1	Short of breath when hurrying on a level or when walking up a slight hill
2	Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes walking at own pace
3	Stops for breath after walking 100 yards, or after a few minutes on level ground
4	Too breathless to leave the house, or breathless when dressing/undressing

