Impact of risk minimisation in patients treated with rosiglitazone-containing products

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STUDY PROTOCOL

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1 Introduction

Rosiglitazone, indicated as a second-line therapy for treatment of type 2 diabetes mellitus, belongs to the drug class thiazolidinediones. Thiazolidinediones are insulin sensitizers; their mechanism of action sets them apart from other oral glucose-lowering medications.[1] Rosiglitazone was marketed in the EU in July 2000; its different preparations – alone or in combination with other glucose-lowering drugs – have been phased-in as follows, as reported by the Danish Medicines Agency and the European Medicines Agency (EMA)[2]:

Rosiglitazone preparations marketed in Denmark and in the United Kingdom

Commercial name	Active substance(s)	Date of initial marketing in Denmark:	Date of approval in UK:
Avandia®	Rosiglitazone	August 2000	July 2000
Avandamet®	Rosiglitazone+Metformin	November 2003	October 2003
Avaglim®	Rosiglitazone+Glimepiride	November 2006	June 2006

Concerns have been raised about cardiovascular safety of rosiglitazone, based on the initial (2007) and the updated (2010) meta-analyses of clinical trials by Nissen and Wolski[3,4] and a Medicare-based study by Graham et al.[5] These studies provided evidence of an increased risk of several cardiovascular outcomes in users of rosiglitazone compared with users of other oral antidiabetic medications or placebo. The postmarketing RECORD trial, ordered by a regulator and sponsored by the manufacturer, GlaxoSmithKlein, published in 2010,[6] showed no overall effect of rosiglitazone on the primary outcome of cardiovascular morbidity and mortality. The trial, however, has been criticized for methodological flaws, including open-label design, considerable selection bias, and possible irregularities in case adjudication.[7]

In response to the safety concerns raised in 2007, EMA emphasised the need for providers ”to adhere to the restrictions for use in patients with cardiac disease”, but advised patients ”not to stop treatment with rosiglitazone and to discuss the medication with their doctor at their next regular visit.”[8] In 2007, EMA concluded “that the benefits of [...] rosiglitazone [...] in the treatment of type 2 diabetes continue to outweigh their risks.”[9] In January 2008, EMA added contraindications for rosiglitazone to its label.[10] The Food and Drug Administration in the United States also issued a boxed warning. The proportion of rosiglitazone prescriptions among all diabetic medications except insulin dropped in the US from around 11% in March 2007 to 6% in July 2007 and to less than 3% in 2009.[11]

Following the two 2010 publications,[4,5] the EMA suspended rosiglitazone-containing drugs from the European markets, on 23 September 2010.[12] On 3 December 2010, the European Commission (EC) issued a suspension decision, noting that risk minimisation in form of label warnings and restricted use has not been clearly effective. The scientific discussion accompanying the suspension decision noted that persons with indications for rosiglitazone may have an a-priori higher risk of cardiovascular morbidity. Still, based on all available evidence, the EC concluded that rosiglitazone does not provide unique therapeutic benefits that outweigh the risks of cardiovascular outcomes.[13]

The present study was commissioned by the European Medicines Agency (EMA), following the suspension of rosiglitazone preparations in the European Union. EMA wishes to retrospectively examine the impact of risk minimisation actions in the European Union (such as warnings, scientific publications, and regulatory decisions) on utilization of rosiglitazone and on the condition of rosiglitazone-using patients with type 2 diabetes (the target population).

2 Specific aims

The specific aims of this study are as follows:

- To describe trends in patterns of utilisation of rosiglitazone-containing preparations over time, in particular, in response to external events, such as scientific and media publications, EMA's press releases, or EMA's regulatory decisions aimed at risk minimisation;
- To examine the extent of use of rosiglitazone-containing preparations in persons with potential contraindications;
- To examine the extent of use of rosiglitazone-containing preparations in persons outside the primary indication (off-label use);
- To examine risk of acute drug reactions among patients who switch from alternative antidiabetic therapies to rosiglitazone preparations or vice versa;
- To examine glycaemic control and other objective parameters of disease among patients who switch from alternative antidiabetic therapies to rosiglitazone preparations or vice versa.

3 Methods

3.1 Setting and study population

This study will be conducted in Denmark and in the United Kingdom (UK).

In Denmark, the source population includes residents of the country's North and the Central regions, with combined population of about 1.8 million, or approximately 33% of the population. Denmark is a welfare state, with universal, tax-funded access to all medical services, including reimbursement for prescribed medicine. Many medical services rendered in Denmark have been routinely and prospectively recorded, on patient level, for the past several decades in population registries; data linked from these registries will be used in the present study.[14]

In the UK, the study will be conducted based on data from the General Practice Research Database (GPRD). The GPRD is an ongoing longitudinal database that collects data from over 350 general practices in the UK since 1987. The UK provides a unique medical environment to create a computerized medical data resource for medical epidemiological research for two main reasons: a) the primary health care system comprehensively covers the UK population; b) the information on all relevant medical care is located in the offices of the general practitioners (GPs), who function as "gatekeepers" for hospital and specialist referrals in the UK health system. The GPRD contains information on more than 6 million patients, of whom 3.5 million are currently registered, and a

cumulative follow-up time of more than 40 million person-years. It covers 6% of the UK population; this sample is representative with respect to age, gender and race/ethnicity distribution.

The study population will include, in both countries, diabetic patients treated with oral glucose lowering drugs between 1 January 2000 and 1 January 2011. This period covers the time from the approval of rosiglitazone for use in the European Union, in July 2000, until the decision by the European Medicines Agency to suspend the drug, on 23 September 2010. The study period also includes a pre-approval and a post-suspension periods to allow examination of drug utilization patterns in response to these events.

3.2 Study design

The study objectives will be addressed using cohort design based on individual-level data linkage. The design will take advantage of existing records that will have accumulated over decades, and is therefore a retrospective cohort design. Measurement and recording of exposure (prescription for oral glucose lowering medication) precedes measurement and recording of the study outcomes (e.g., acute reactions, changes in laboratory parameters).

Because of concerns over the cardiovascular safety of rosiglitazone, it would be unethical to use an experimental study to address the study objectives. Furthermore, while experimental studies answer the question about drug efficacy and safety in carefully selected and closely observed patient populations, observational studies are better suited for evaluation of the drugs' 'real-world' utilization and safety.[15] A cohort study based on linkage of population-based routine records has the advantage of avoiding selection bias that could ensue in a cohort study with routine data collection if patients self-selected to participate or to drop out of the study.

3.3 Exposure definition and measurement

To identify users of oral glucose lowering medications, including rosiglitazone, we will use the Aarhus University Prescription Database (AUPD)[16] in Denmark and the General Practice Research Database (GPRD) in the UK.[17] The AUPD tracks prescription dispensations, while the GPRD records prescriptions issued by physicians. Antidiabetic medications are available by prescription only in both countries.

We will identify patients with *two or more* prescriptions for oral glucose lowering drugs redeemed (in Denmark) or issued (in UK) between 1 January 2000 and 1 January 2011. Because dispensed prescriptions contain personal identifiers, we will be able to determine the number of unique users of each oral glucose lowering drug or their combinations. Currently, AUPD contains data on approximately 2,400, while GPRD has data on approximately 20,000 users of rosiglitazone preparations.

Based on recorded prescription dates, we will examine the patterns of oral glucose lowering drug use during the study period. A person will be considered a switcher once they have received two or more prescriptions for a new therapy. Users will be classified into several categories (not all drug combinations listed below may exist in the actual data):

- Those who receive rosiglitazone monotherapy as the first oral glucose lowering drug;

- Those who use oral glucose lowering drugs other than rosiglitazone (classified by type of drug);
- Those who switch from oral glucose lowering drugs other than rosiglitazone to rosiglitazone;
- Those who switch from rosiglitazone to an alternative oral glucose lowering drug. This group may include people who received alternative oral glucose lowering drugs before rosiglitazone use;
- Those in whom rosiglitazone is added to a prior alternative therapy;
- Those in whom an alternative oral glucose lowering drugs is added to rosiglitazone therapy.

List of medications, with codes used to identify them, appears in Appendix 1.

3.4 Endpoints

All codes relevant to abstracting diagnostic, drug, and laboratory data appear in Appendix 1.

3.4.1 Use of rosiglitazone in persons with contraindications

These outcomes will be ascertained using the Danish National Registry of Patients in Denmark and using the GPRD's Event File in the UK.

Using data on inpatient and outpatient hospitalizations, we will ascertain proportions of rosiglitazone users with the following conditions recorded before the first prescription for rosiglitazone (since 1977 in Denmark, since 1987 in the UK):

- History of heart failure or ischemic heart disease;
- History of acute coronary syndrome;
- History of peripheral vascular disease
- History of acute myocardial infarction;
- History of hepatic impairment (moderate to severe liver disease);

3.4.2 Off-label use

These outcomes will be ascertained using AUPD or the Danish National Registry of Patients in Denmark and using the GPRD's Event File or Drug File in the UK. Off-label use will be defined as prescription of rosiglitazone dispensed by/issued to:

- Patients aged 16 years or younger at the time of any rosiglitazone prescription;
- Patient with concomitant use of insulin, defined as at least one prescription for insulin in between the first and last prescription for rosiglitazone[2];
- Patients diagnosed with type 1 diabetes mellitus;

- Women with gestational diabetes without evidence of pre-gestational diabetes (UK only);
- Women with polycystic ovary syndrome (UK only)

3.4.3 Acute drug reactions

Both acute and pre-existing events will be identified in the Danish National Registry of Patients and in the Registry of Causes of Death in Denmark and in the GPRD's Event file, in the UK.

Acute drug reactions will be defined as new (first-onset) events occurring 45 days after the date of the switch to or from a rosiglitazone preparation. We will use prior hospitalization records to screen out prevalent/prior events and conditions. The exact distribution of events that may represent a potential acute drug reaction is unknown until data analysis. We will rank all recorded new events in the order of seriousness and potential of representing an acute drug reaction. Since cardiovascular side effects are a major safety concern for rosiglitazone, as a minimum, we will examine the following events:

- All-cause mortality;
- Cardiovascular mortality;
- Acute myocardial infarction;
- Cerebrovascular accident/ischemic stroke
- Pulmonary embolism;
- Deep vein thrombosis.

3.4.4 Glycaemic control

Glycaemic control will be assessed by examining levels of blood glucose concentration and glycated (glycosylated) haemoglobin A (HbA1c), or both, whenever available. Plasma glucose concentration fluctuates in response to food intake, and fasting state of patients is not always ascertainable. Haemoglobin A in the red blood cells binds to plasma glucose, becoming irreversibly glycated for the duration of the erythrocytes' lifespan. Thus, HbA1c represents a summary of glucose values over the preceding 1 – 4 months both in fasting and postprandial states. The proportion of glycated haemoglobin A is linearly related to long-term blood glucose concentration and is currently a standard measure of long-term glycaemic control.[18]

Results of laboratory investigations will be ascertained from the Laboratory Information Systems of the North and the Central Denmark Regions (LABKA database) in Denmark and from the GPRD's Laboratory File, in the UK. Relevant codes are provided in Appendix 1.

We will use the following measures of plasma glucose concentration (differentiating fasting from non-fasting patients whenever available):

- Mean and median change;
- Percent change from the baseline value;

- Treatment failure, defined as fasting plasma glucose level >180 mg per decilitre.

We will use the following measures of HbA1c:

- Mean and median change;
- Percent change from the baseline value;
- Results of 120-minute glucose tolerance test (standard measure of diabetes; possibly in Denmark)
- Loss of glycaemic control, defined as of HbA1c level >7.5%.

3.4.5 Biochemical parameters of disease other than glycaemic control

We will examine changes/occurrence post-baseline (see Analysis Plan for definition) of the following biochemical parameters according to the patterns of use of oral glucose-lowering drugs:

- Total cholesterol;
- LDL cholesterol;
- HDL cholesterol;
- Triglycerides;
- Haemoglobin (as a measure of anaemia);
- Alanintransaminase (ALAT as a measure of liver failure);
- Serum creatinine (as a measure of kidney failure);
- Albumin/creatinine ratio, as an early marker of vascular damage indicative or early cardiovascular damage;
- Arterial blood pressure (on a subset only if available; source: NIP data in Denmark; Additional Clinical Details File in the GPRD).

3.5 Covariates definition and measurement

Baseline comorbidities will be ascertained by examining inpatient and outpatient hospital diagnoses in the ten years preceding study enrolment and recorded in the Danish National Registry of Patients in Denmark and in the GPRD's Event File in the UK. We will use the Charlson comorbidity index to summarise comorbidities (other than diabetes) in the analysis.[19]

Use of prescription medication other than oral glucose lowering therapy will be ascertained based on prescription history (AUPD in Denmark; Drug File in the GPRD). Concomitant use will be defined as a record of at least one prescription for a medication that falls in one of the categories listed below between the first and the last prescription for glucose lowering therapy.

- Lipid-lowering agents (statins);

- Antihypertensive agents (ACE inhibitors, angiotensin receptor blockers, beta-blockers, calcium-channel blockers);
- Diuretics (loop, potassium sparing, thiazide);
- Nitrates;
- Antiplatelet agents.

Smoking, alcoholism, and body mass index (BMI) are available for about 70% of the patients in the GPRD's Additional Clinical Detail File (for the UK). In Denmark, these data are not generally recorded in registries, although there are diagnostic codes for obesity and alcoholism, which we will use to identify patients who were hospitalised. It may be possible to obtain data on smoking, body mass index and blood pressure at least on some members of the study population via linkage to the National Indicator Project and Danish Registry of Patients. The size of subgroup with available data on smoking, alcoholism, and BMI will not be known until data linkage.

Age and sex of the patients: in Denmark, date of birth and sex are encoded in the unique identifier that will be used to link the data; in the UK, the GPRD records the demographic data in the Registration File.

3.6 Analysis plan

3.6.1 Drug utilization patterns

Based on the dates of rosiglitazone marketing, publications, and regulatory decisions, the following four broad periods can be identified, in which drug utilization patterns will be examined, starting with 1 July 2000, when rosiglitazone was introduced to the EU market:

Period 1 1 July 2000 to 23 May 2007 (meta-analysis & by EMA's press release)

Period 2 24 May 2007 to 24 January 2008 (EMA adds contra-indications)

Period 3 25 January 2008 to 22 September 2010 (EMA suspends rosiglitazone)

Period 4 23 September 2010 until data closing date.

We will evaluate prescribing patterns within these periods and according to calendar month by several methods. First, we will calculate (separately in Denmark and in the UK):

- The number of persons receiving prescriptions for rosiglitazone in each time period, overall and per month during the time period;
- The number of prescriptions for rosiglitazone in each time period, overall and per month during the time period;
- The number of persons receiving a prescription for any specific antidiabetic medication in each time period, overall and per month during the time period;

- The proportion of persons receiving a prescription for any specific antidiabetic medication who received a prescription for rosiglitazone in each time period.

We will describe switching patterns in several ways within each database. First we will determine the proportion of patients on anti-diabetic therapies other than rosiglitazone who switched to rosiglitazone in each of the 4 time periods. We will also describe the proportion of people, by time period, who switched from rosiglitazone to another anti-diabetic medication or who discontinued use of any anti-diabetic medication. Proportions of patients discontinuing rosiglitazone preparations will be determined among those who originally switched to rosiglitazone and among those for whom the rosiglitazone-containing product was the first-ever anti-diabetic prescription. Switching will be defined as 1) stopping all rosiglitazone prescriptions and starting a different anti-diabetic medication, 2) stopping all anti-diabetic medications or 3) adding new anti-diabetic therapies to the current rosiglitazone therapy (concomitant therapies). A person will be considered a switcher once they have received at least 2 prescriptions for a new therapy.

To more clearly display time trends and the influence of the milestones that separate the time periods, we will create smoothed plots of the four parameters listed in the bullets above. We will define a window of length four months, and calculate each of the four parameters in that window, beginning in the first four months of 2000 (January, February, March, and April). We will plot the values of the four parameters at the midpoint of the window (1 March 2000). We will then slide the window one month forward and recalculate all four parameters in that window (February, March, April, and May of 2000). Data from January of 2000 falls out of the window and data from May of 2000 enters the window). We will plot the values of the four points at the midpoint of the window (1 April 2000). We will continue to slide the four-month window along the time axis until the end of the study period, calculating the parameters and plotting them at the midpoint of each window. The result will be a smoothed plot of trends in the parameters. We expect, for example, that the number of prescriptions for rosiglitazone will not exceed 0 until the first window that includes August 2000 appears. The number of prescriptions for rosiglitazone will likely increase, then reach a steady state, then decrease with the first milestone (May 2007). We will depict these milestone events on the graph, which will clearly display the correspondence between changes in the parameters and the milestone events.

This method of smoothing the results depicts trends without imposing a model on the data. A model embeds assumptions, such as the expected changes in trends at the milestones, which can become a self-fulfilling prophecy. It is important to begin the analysis without a model. If the smoothed data suggest that models of these results would be productive, and the modelling results would be useful, then we will fit models of the appropriate form. We expect these models will require regression splines, with knots (nodes) at the milestone dates. Such models would allow us to calculate, for example, the rate of change in number of prescriptions or proportion of diabetics receiving prescriptions within time periods. The model would also allow a quantitative comparison of the change in proportion in Denmark versus the UK, as a measure of homogeneity of the response in Europe to the milestone events.

3.6.2 Contraindications for use and off-label use

Prevalence of contraindicated or off-label use will be examined according to calendar time, where events marking relevant scientific publications and regulatory decisions will be marked. We will

report the number and proportion of patients prescribed rosiglitazone who had a diagnosis consistent with a contraindication for rosiglitazone use or with off-label use as defined in the Methods. We will provide the proportions in each country and over time. We will follow the analytic methods described above, provided that the sample size is large enough. At a minimum, use by patients with the additional contraindications (ischemic heart disease and/or peripheral vascular disease) listed in the 2008 press release[10] will be examined in the periods before and after the publication of the press release including any prior diagnosis of liver disease, ischemic heart disease, cardiac failure, or acute coronary syndrome.

3.6.3 Acute drug reactions

For patient-level endpoints, baseline will be defined as the recorded date of medication switch/addition (as reflected by a new dispensation/issue); date of the first-time prescription dispensation/issue (in first-time users) or 1 January 2000 (in prevalent users).

We will examine the number of potential drug reactions occurring within 45 days of baseline and calculate the 45-day cumulative incidence of acute drug reactions, overall and diagnosis-specific (if the data set is large enough); We will estimate risk ratios for the acute drug reactions identified using regression, while adjusting for confounding.

3.6.4 Glycaemic control and other biochemical disease parameters

We will compare recorded plasma glucose concentration, HbA1c values, and other objective disease parameters before and after the baseline. Because the date of dispensation/issue does not precisely indicate the exact date of patient medication switch, we do not know the precise day that the patient starts the new medication), it will be important to explore different time windows after the recorded dispensation/issue date. We will compare measurements at various time points before and after the baseline. The latest measurement before the baseline will be assumed to indicate the baseline value for the analysis. The follow-up time after baseline is expected to vary depending on the date of available laboratory testing. We will conduct analyses examining 1, 3, and 6-month post-baseline changes in laboratory parameters.

Furthermore, we will examine the potential role of secular trends – scientific or media publications and EMA warnings – by controlling in the analysis for time elapsed from an event that could potentially trigger medication switch and the time of actual switch (approximated by the date of the new prescription). We propose that recency of potential triggering events may be an indirect indicator of patient's underlying risk of potential adverse events as perceived by patients themselves or their providers.

4 Quality assurance, feasibility and reporting

This study will be carried out by scientists employed at academic institutions. The study in Denmark will be conducted by the study coordinator, the Department of Clinical Epidemiology (DCE), Aarhus University, Denmark. The study in the UK will be conducted by the Boston Collaborative Drug Surveillance Program (BCDSP), which is an independent research unit affiliated with Boston University, USA. The study was commissioned to the Department of Clinical Epidemiology by the European Medicines Agency. EMA is the sole sponsor of the study. Because

EMA required that data from at least two EU Member States be included in this evaluation, DCE subcontracted BCDSP to conduct the analyses in the United Kingdom.

The Department of Clinical Epidemiology has 10-year experience in registry-based research in Denmark. Most of the databases that will be used for linkage in this study are in-house at DCE. As of 2010, the BCDSP has had 21 years of experience with the organization, validation, and research use of the GPRD. The DCE has access to all data necessary to conduct this study in Denmark, while BCDSP has access to all data necessary to conduct this study in the GPRD. The researchers in both institutions have extensive experience working with and publishing from these data sources.

The core research team will consist of epidemiologists and biostatisticians with experience in drug safety studies; for clinical and laboratory data extraction, and results' interpretation, an experienced diabetologist will be consulted. Data linkage, extraction, coding, and management will be conducted by experienced statisticians, using established institutional facilities, including secure servers. Data analysis will be performed using SAS statistical software (SAS, Inc., Cary, NC. USA). The interim report will include data available in time to prepare the report by the deadline for the interim report (1 April 2011). The final report will be the update of the interim report with the data that become available in time for inclusion to the final report (1 October 2011). The milestones for data collection, analysis, and final report submission have been established and agreed upon with the funding agency. Appendix 2 (Research Contract) includes the milestones.

Validation studies of Denmark's registries and of GPRD have shown satisfactory data validity in these sources for research purposes.[20,21] All data sources are updated regularly.

Sources of systematic error in epidemiologic studies include selection bias, information bias and confounding. Because of routine data collection in the data sources involved, selection bias is expected to be negligible. Information bias may stem from inability to ascertain the actual drug intake from prescription issue or dispensation data; however, because of chronic nature of the underlying condition, high compliance with oral glucose-lowering drug may be assumed, although timing of medication switch remains as a source of uncertainty and is a limitation. Another limitation is potential residual confounding by lifestyle factors, such as alcohol, diet and smoking, which are only partially or not at all recorded in the available data sources.

The study is feasible: based on preliminary data linkage, currently there are about 2,400 users of rosiglitazone preparations recorded in the Aarhus University Prescription Database and approximately 20,000 users of rosiglitazone preparations can be identified in the GPRD. Majority of these users also have available laboratory data. Because the study will be based on linkage of routine records, no appreciable patient attrition is expected, and follow-up end can be ascertained exactly by obtaining data on dates of emigration and death.

5 Ethical issues

The Danish Data Protection Law requires that approval be obtained from the Data Protection Agency for use of registry data. The Department of Clinical Epidemiology has obtained all approvals necessary to conduct his project.

All studies conducted using the GPRD must be approved by the Independent Scientific Advisory Committee. The BCDSP is in the process of obtaining this approval.

6 Data sources and linkage

6.1 Denmark

The Aarhus University Prescription Database records all reimbursed prescriptions dispensed in community pharmacies of the North and Central Denmark Regions – 2 of the 5 Danish regions, with combined population of 1.8 million, or 30% of the entire Denmark's population. Prescriptions for oral glucose-lowering medications are eligible for general reimbursement and are therefore recorded in this database; more that 98% of antidiabetic prescription are dispensed in the primary sector,[2] and are therefore expected to be recorded in this database. Recorded information includes the Anatomical Therapeutic Chemical classification of the drug, date of the dispensation, and unique product number.

Laboratory Information Systems for North and Central Denmark Regions (LABKA) track all hospital-performed laboratory tests, including those sent to hospital laboratories by general practice. The following data are recorded: the test name and IUPAC-code, the result, the measurement unit, the dates of ordering and carrying each test. The current coverage period for the Central Region ~ October 1999 to September of 2009, inclusive, for the North Region from 1997 to 2008, inclusive.

The Danish Central Personal Registry covers the entire Danish population and since 1968 has registered all births, deaths, and migration of Danish residents. This database contains dates of all recorded events and is updated daily.

The Danish Registry of Causes of Death contains information on causes of death, including associated diagnoses. Data have been collected since 1970.

The Danish National Registry of Patients covers the entire Danish population and has registered hospitalizations since 1977, including outpatient visits since 1995. Up to 20 discharge diagnoses are recorded for each hospital contact, using the International Classification of Diseases 10th revision (ICD-10) since 1994 and ICD-8 in the earlier period.

The Danish National Indicator Project (DNIP) was established in 1999 as a national quality monitoring and development project, aiming to measure and improve core healthcare services by means of indicators (indicator monitoring). During 2000–2008, disease-specific, evidence-based indicator sets for selected conditions –including diabetes – have been developed and implemented. The NIP registration form for diabetic patients includes variables for date of diagnosis, date of diagnosis and type of diabetes, smoking habits, body mass index, blood pressure measurement, and HbA1c. This database is updated quarterly with a delay of one quarter. The latest update was in June 2010. Supplementary data on some rosiglitazone users may be available from the Danish National Indicator Project for Diabetes (DNIP)[22], which was established in 1999 and collects annual measurements on HbA1c, smoking, body mass index, and blood pressure of diabetic patients in Denmark. For this project, we will apply for access and link the study population data with the DNIP files, although the extent of data overlap cannot be determined until the data are linked. Another shortcoming of these data is that only the most recent measurement in each calendar year is recorded, which does not necessarily represent the measurement most relevant to medication switch. At the same time, DNIP files may provide information on smoking and obesity for some of the diabetic patients.

Data linkage. All data sources listed above can be linked on patient level by the unique civil registration number, which is used to identify persons in all Danish registries. This number encodes person's sex and date of birth, enabling calculation of age at each time point or event.[23]

6.2 United Kingdom

The GPRD data are recorded using multiple data screens or files. These include the registration file, the drug file, the event file, the laboratory file, and files containing additional clinical details:

Registration File This file contains information regarding the registration status of each covered patient. Besides unique identification numbers for each individual, family, and practice, this file includes year of birth, gender, date of registration with the current general practice, most recent registration status (permanent, transferred out, died), and date of death or departure from the practice including reason for departure (where applicable).

Drug File This file contains detailed information on all drugs prescribed by the GP. Drugs are coded with the Multilex coding system, with a specific code for each commercial preparation. Details include the date of each drug prescription, the precise drug formulation and strength, the quantity and the dosing instructions of drug prescribed. In addition, the indication for treatment is required for all new courses of therapy. This classification of indication is done by cross-referencing prescriptions against medical events on the same date. It is worth noting that when patients are initially seen by consultants or in hospital, future drug therapy is directed through the GP and is thus captured by the database.

Event File This file contains all clinically relevant patient diagnoses along with the date of the event. Because the GP is the primary care giver for all patients in the National Health Service, all consultants are required to send a letter to the GP whenever a patient is seen in hospital or by an outpatient specialist, describing the relevant clinical events and final diagnoses. In addition to usual care in the GP office, GPs are required to enter all diagnoses resulting from hospitalizations, consultations, or emergency medical care. Diagnoses and events are coded using the READ code.

Additional Clinical Details File This file contains patient general health/life information such as blood pressure, height, weight, smoking status, alcohol use, cervical smears, and medical procedures. While the GPs are not required to update all of these data fields, information on characteristics such as height, weight, and smoking have been used repeatedly and are available on greater than 70% of the population.

Laboratory and **Immunization Files** contain information on laboratory tests performed and all immunizations that are provided.

Data linkage. The GPRD's Registration file contains unique identification numbers for each individual, family, and practice, year of birth, gender, date of registration with the current general practice, most recent registration status (permanent, transferred out, died), and date of death or departure from the practice including reason for departure (where applicable). All files in the GPRD are linkable via the unique identification number.

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Appendix 1. Codes used in data abstraction

Diagnostic codes used to Abstract the Danish National Registry of Patients and the Registry of Causes of Death

Disease/condition	ICD-8 code	ICD-10 code
Diabetes type 1	249.00; 249.06; 249.07; 249.09	E10.0, E10.1; E10.9
Diabetes type 2	250.00; 250.06; 250.07; 250.09	E11.0; E11.1; E11.9
Acute myocardial infarction	410	I21, I22, I23
Ischemic heart disease (acute and chronic)	411-414	I20, I24, I25
Congestive heart failure	427.09, 427.10, 427.11, 427.19, 428.99, 782.49;	I50, I11.0, I13.0, I13.2
Other cardiac disease	393–398, 400–404	I05–I09
Peripheral vascular disease	440, 441, 442, 443, 444, 445	I70, I71, I72, I73, I74, I77
Ischemic stroke	430-438 (cerebrovascular disease)	I63-64
Alcoholism	291, 303, 577.10, 571.09, 571.10	F10.1-F10.9, G31.2, G62.1, G72.1, I42.6, K29.2, K86.0, Z72.1
Obesity	277.99	E65-E66
Mild liver disease	571, 573.01, 573.04	B18, K70.0–K70.3, K70.9, K71, K73, K74, K76.0
Moderate to severe liver disease	070.00, 070.02, 070.04, 070.06, 070.08, 573.00, 456.00–456.09	B15.0, B16.0, B16.2, B19.0, K70.4, K72, K76.6, I85
Deep vein thrombosis	451.00	I81, I82
Pulmonary embolism	450.99	I26

ICD-8: http://www.sst.dk/Indberetning%20og%20statistik/Klassifikationer/SKS_download.aspx
ICD-10: http://apps.who.int/classifications/apps/icd/icd10online/

Diagnostic codes used to compute Charlson Comorbidity Index[19]

Disease	ICD-8 code	ICD-10 code
Myocardial infarction	410	I21;I22;I23
Congestive heart failure	427.09; 427.10; 427.11; 427.19; 428.99; 782.49	I50; I11.0; I13.0; I13.2
Peripheral vascular disease	440; 441; 442; 443; 444; 445	I70; I71; I72; I73; I74; I77
Cerebrovascular disease	430-438	I60-I69; G45; G46
Dementia	290.09-290.19; 293.09	F00-F03; F05.1; G30
Chronic pulmonary disease	490-493; 515-518	J40-J47; J60-J67; J68.4; J70.1; J70.3; J84.1; J92.0; J96.1; J98.2; J98.3
Connective tissue disease	712; 716; 734; 446; 135.99	M05; M06; M08; M09;M30;M31; M32; M33; M34; M35; M36; D86
Ulcer disease	530.91; 530.98; 531-534	K22.1; K25-K28
Mild liver disease	571; 573.01; 573.04	B18; K70.0-K70.3; K70.9; K71; K73; K74; K76.0
Diabetes type1 Diabetes type2	249.00; 249.06; 249.07; 249.09 250.00; 250.06; 250.07; 250.09	E10.0, E10.1; E10.9 E11.0; E11.1; E11.9
Hemiplegia	344	G81; G82
Moderate to severe renal disease	403; 404; 580-583; 584; 590.09; 593.19; 753.10-753.19; 792	I12; I13; N00-N05; N07; N11; N14; N17-N19; Q61
Diabetes with end organ damage type1 type2	 249.01-249.05; 249.08 250.01-250.05; 250.08	 E10.2-E10.8 E11.2-E11.8
Any tumor	140-194	C00-C75
Leukemia	204-207	C91-C95
Lymphoma	200-203; 275.59	C81-C85; C88; C90; C96
Moderate to severe liver disease	070.00; 070.02; 070.04; 070.06; 070.08; 573.00; 456.00-456.09	B15.0; B16.0; B16.2; B19.0; K70.4; K72; K76.6; I85
Metastatic solid tumor	195-198; 199	C76-C80
AIDS	079.83	B21-B24

Anatomical Therapeutic Chemical (ATC) codes used to abstract the Aarhus University Prescription Database

Drug	**ATC code**
Drugs used in diabetes	A10
Insulins and analogues for injection, fast-acting	A10AB
Insulins and analogues for injection, intermediate-acting	A10AC
Insulins and analogues for injection, intermediate-acting combined with fast-acting	A10AD
Insulins and analogues for injection, long-acting	A10AE
Insulins and analogues for inhalation	A10AF
Rosiglitazone preparations	A10BG02 rosiglitazone A10BD03 rosiglitazone+metformin A10BD04 rosiglitazone+glimepiride
Biguanides	A10BA
Sulfonamides, urea derivatives	A10BB
Sulfonamides (heterocyclic)	A10BC
Combinations of oral blood glucose lowering drugs	A10BD (except A10BD03 and A10BD04)
Thiazolidinediones other than rosiglitazone	A10BG03 (pioglitazone)
Alpha glucosidase inhibitors	A10BF
Dipeptidyl peptidase 4 (DPP-4) inhibitors	A10BH
Other blood glucose lowering drugs, excl. insulins	A10BX
Lipid-lowering drugs including statins	C10A
Antihypertensive agents	C07 (beta blockers) C08 (calcium channel blockers) C09, C09 (ACE-inhibitors and angiotensin blockers)
Diuretics (loop, potassium sparing, thiazide)	C03
Nitrates	C01DA
Antiplatelet agents (anti-thrombotic)	B01A

ATC classification: http://www.whocc.no/atc_ddd_index/

Codes used to identify laboratory tests accodring to the International Union of Pure and Applied Chemistry (IUPAC)

Test	IUPAC codes
Fasting blood glucose	ASS00203, ASS00204, DNK35842, NPU02193, NPU02195, NPU08509, NPU08972, NPU22069
HbA1c	NPU02307,NPU03835
Haemoglobin (anaemia)	NPU02319, AAA00359, AAA00137, AAA00115
Alanintransaminase	DNK05051,NPU19651
Albumin/creatinine ratio (urine)	ASS00023, ASS00024, ASS00194, AAA00760,DNK05289, NPU03918, NPU03929, 10913
Serum creatinine	NPU18016, NPU01807
Total cholesterol	NPU01566
LDL cholesterol	NPU01568, NPU10171
HDL cholesterol	NPU01567, NPU10157
Triglycerides	NPU03620

IUPAC codes: http://www.sst.dk/NPU

Diagnostic codes used to abstract the General Practice Research Database

Diabetes (includes both non-specific and Type II)

13AB.00 DIABETIC LIPID LOWERING DIET
13AC.00 DIABETIC WEIGHT REDUCING DIET
2BBF.00 RETINAL ABNORMALITY - DIABETES RELATED
2G51000 FOOT ABNORMALITY - DIABETES RELATED
2G5A.00 O/E - RIGHT DIABETIC FOOT AT RISK
2G5B.00 O/E - LEFT DIABETIC FOOT AT RISK
3882.00 DIABETES WELL BEING QUESTIONNAIRE
3883.00 DIABETES TREATMENT SATISFACTION QUESTIONNAIRE
42W..00 HB. A1C - DIABETIC CONTROL
42WZ.00 HB. A1C - DIABETIC CONTROL NOS
42c..00 HBA1 - DIABETIC CONTROL
66A..00 DIABETIC MONITORING
66A2.00 FOLLOW-UP DIABETIC ASSESSMENT
66A3.00 DIABETIC ON DIET ONLY
66A4.00 DIABETIC ON ORAL TREATMENT
66A8.00 HAS SEEN DIETICIAN - DIABETES
66A9.00 UNDERSTANDS DIET - DIABETES
66AD.00 FUNDOSCOPY - DIABETIC CHECK
66AG.00 DIABETIC DRUG SIDE EFFECTS
66AH.00 DIABETIC TREATMENT CHANGED
66AH000 CONVERSION TO INSULIN
66AI.00 DIABETIC - GOOD CONTROL
66AJ.00 DIABETIC - POOR CONTROL
66AJ.11 UNSTABLE DIABETES
66AJ100 BRITTLE DIABETES
66AJz00 DIABETIC - POOR CONTROL NOS
66AK.00 DIABETIC - COOPERATIVE PATIENT
66AL.00 DIABETIC-UNCOOPERATIVE PATIENT
66AM.00 DIABETIC - FOLLOW-UP DEFAULT
66AN.00 DATE DIABETIC TREATMENT START
66AO.00 DATE DIABETIC TREATMENT STOPP.
66AP.00 DIABETES: PRACTICE PROGRAMME
66AQ.00 DIABETES: SHARED CARE PROGRAMME
66AR.00 DIABETES MANAGEMENT PLAN GIVEN
66AS.00 DIABETIC ANNUAL REVIEW
66AT.00 ANNUAL DIABETIC BLOOD TEST
889A.00 DIAB MELLIT INSULIN-GLUCOSE INFUS ACUTE MYOCARDIAL INFARCT
8A12.00 DIABETIC CRISIS MONITORING
8A13.00 DIABETIC STABILISATION
8CA4100 PT ADVISED RE DIABETIC DIET
8H2J.00 ADMIT DIABETIC EMERGENCY
C10..00 DIABETES MELLITUS
C100.00 DIABETES MELLITUS WITH NO MENTION OF COMPLICATION
C100100 DIABETES MELLITUS, ADULT ONSET, NO MENTION OF COMPLICATION
C100111 MATURITY ONSET DIABETES
C100112 NON-INSULIN DEPENDENT DIABETES MELLITUS

C100z00 DIABETES MELLITUS NOS WITH NO MENTION OF COMPLICATION
C101.00 DIABETES MELLITUS WITH KETOACIDOSIS
C101100 DIABETES MELLITUS, ADULT ONSET, WITH KETOACIDOSIS
C101y00 OTHER SPECIFIED DIABETES MELLITUS WITH KETOACIDOSIS
C101z00 DIABETES MELLITUS NOS WITH KETOACIDOSIS
C102.00 DIABETES MELLITUS WITH HYPEROSMOLAR COMA
C102100 DIABETES MELLITUS, ADULT ONSET, WITH HYPEROSMOLAR COMA
C102z00 DIABETES MELLITUS NOS WITH HYPEROSMOLAR COMA
C103.00 DIABETES MELLITUS WITH KETOACIDOTIC COMA
C103100 DIABETES MELLITUS, ADULT ONSET, WITH KETOACIDOTIC COMA
C104.00 DIABETES MELLITUS WITH RENAL MANIFESTATION
C104.11 DIABETIC NEPHROPATHY
C104100 DIABETES MELLITUS, ADULT ONSET, WITH RENAL MANIFESTATION
C104y00 OTHER SPECIFIED DIABETES MELLITUS WITH RENAL COMPLICATIONS
C104z00 DIABETES MELLITIS WITH NEPHROPATHY NOS
C105.00 DIABETES MELLITUS WITH OPHTHALMIC MANIFESTATION
C105100 DIABETES MELLITUS, ADULT ONSET, + OPHTHALMIC MANIFESTATION
C105y00 OTHER SPECIFIED DIABETES MELLITUS WITH OPHTHALMIC COMPLICATN
C105z00 DIABETES MELLITUS NOS WITH OPHTHALMIC MANIFESTATION
C106.00 DIABETES MELLITUS WITH NEUROLOGICAL MANIFESTATION
C106.11 DIABETIC AMYOTROPHY
C106.12 DIABETES MELLITUS WITH NEUROPATHY
C106.13 DIABETES MELLITUS WITH POLYNEUROPATHY
C106100 DIABETES MELLITUS, ADULT ONSET, + NEUROLOGICAL MANIFESTATION
C106y00 OTHER SPECIFIED DIABETES MELLITUS WITH NEUROLOGICAL COMPS
C106z00 DIABETES MELLITUS NOS WITH NEUROLOGICAL MANIFESTATION
C107.00 DIABETES MELLITUS WITH PERIPHERAL CIRCULATORY DISORDER
C107.11 DIABETES MELLITUS WITH GANGRENE
C107.12 DIABETES WITH GANGRENE
C107100 DIABETES MELLITUS, ADULT, + PERIPHERAL CIRCULATORY DISORDER
C107200 DIABETES MELLITUS, ADULT WITH GANGRENE
C107z00 DIABETES MELLITUS NOS WITH PERIPHERAL CIRCULATORY DISORDER
C108y00 OTHER SPECIFIED DIABETES MELLITUS WITH MULTIPLE COMPS
C108z00 UNSPECIFIED DIABETES MELLITUS WITH MULTIPLE COMPLICATIONS
C109.00 NON-INSULIN-DEPENDENT DIABETES MELLITUS
C109.11 NIDDM - NON-INSULIN DEPENDENT DIABETES MELLITUS
C109.12 TYPE 2 DIABETES MELLITUS
C109.13 TYPE II DIABETES MELLITUS
C109000 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH RENAL COMPS
C109011 TYPE II DIABETES MELLITUS WITH RENAL COMPLICATIONS
C109100 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH OPHTHALM COMPS
C109111 TYPE II DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
C109200 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH NEURO COMPS
C109211 TYPE II DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
C109300 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH MULTIPLE COMPS
C109400 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH ULCER
C109411 TYPE II DIABETES MELLITUS WITH ULCER
C109500 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH GANGRENE
C109511 TYPE II DIABETES MELLITUS WITH GANGRENE
C109600 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH RETINOPATHY
C109611 TYPE II DIABETES MELLITUS WITH RETINOPATHY

C109700 NON-INSULIN DEPENDANT DIABETES MELLITUS - POOR CONTROL
C109711 TYPE II DIABETES MELLITUS - POOR CONTROL
C109900 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITHOUT COMPLICATION
C109A00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH MONONEUROPATHY
C109A11 TYPE II DIABETES MELLITUS WITH MONONEUROPATHY
C109B00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH POLYNEUROPATHY
C109B11 TYPE II DIABETES MELLITUS WITH POLYNEUROPATHY
C109C00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH NEPHROPATHY
C109C11 TYPE II DIABETES MELLITUS WITH NEPHROPATHY
C109D00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH HYPOGLYCA COMA
C109D11 TYPE II DIABETES MELLITUS WITH HYPOGLYCAEMIC COMA
C109E00 NON-INSULIN DEPEND DIABETES MELLITUS WITH DIABETIC CATARACT
C109E11 TYPE II DIABETES MELLITUS WITH DIABETIC CATARACT
C109F00 NON-INSULIN-DEPENDENT D M WITH PERIPHERAL ANGIOPATH
C109F11 TYPE II DIABETES MELLITUS WITH PERIPHERAL ANGIOPATHY
C109G00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH ARTHROPATHY
C109G11 TYPE II DIABETES MELLITUS WITH ARTHROPATHY
C109H00 NON-INSULIN DEPENDENT D M WITH NEUROPATHIC ARTHROPATHY
C109H11 TYPE II DIABETES MELLITUS WITH NEUROPATHIC ARTHROPATHY
C10A.00 MALNUTRITION-RELATED DIABETES MELLITUS
C10A000 MALNUTRITION-RELATED DIABETES MELLITUS WITH COMA
C10A100 MALNUTRITION-RELATED DIABETES MELLITUS WITH KETOACIDOSIS
C10B.00 DIABETES MELLITUS INDUCED BY STEROIDS
C10B000 STEROID INDUCED DIABETES MELLITUS WITHOUT COMPLICATION
C10y.00 DIABETES MELLITUS WITH OTHER SPECIFIED MANIFESTATION
C10y100 DIABETES MELLITUS, ADULT, + OTHER SPECIFIED MANIFESTATION
C10yy00 OTHER SPECIFIED DIABETES MELLITUS WITH OTHER SPEC COMPS
C10yz00 DIABETES MELLITUS NOS WITH OTHER SPECIFIED MANIFESTATION
C10z.00 DIABETES MELLITUS WITH UNSPECIFIED COMPLICATION
C10z100 DIABETES MELLITUS, ADULT ONSET, + UNSPECIFIED COMPLICATION
C10zz00 DIABETES MELLITUS NOS WITH UNSPECIFIED COMPLICATION
C350011 BRONZED DIABETES
Cyu2.00 [X]DIABETES MELLITUS
Cyu2000 [X]OTHER SPECIFIED DIABETES MELLITUS
F171100 AUTONOMIC NEUROPATHY DUE TO DIABETES
F345000 DIABETIC MONONEURITIS MULTIPLEX
F35z000 DIABETIC MONONEURITIS NOS
F372.00 POLYNEUROPATHY IN DIABETES
F372.11 DIABETIC POLYNEUROPATHY
F372.12 DIABETIC NEUROPATHY
F372000 ACUTE PAINFUL DIABETIC NEUROPATHY
F372100 CHRONIC PAINFUL DIABETIC NEUROPATHY
F372200 ASYMPTOMATIC DIABETIC NEUROPATHY
F381300 MYASTHENIC SYNDROME DUE TO DIABETIC AMYOTROPHY
F381311 DIABETIC AMYOTROPHY
F3y0.00 DIABETIC MONONEUROPATHY
F420.00 DIABETIC RETINOPATHY
F420000 BACKGROUND DIABETIC RETINOPATHY
F420100 PROLIFERATIVE DIABETIC RETINOPATHY
F420200 PREPROLIFERATIVE DIABETIC RETINOPATHY
F420300 ADVANCED DIABETIC MACULOPATHY

F420400 DIABETIC MACULOPATHY
F420500 ADVANCED DIABETIC RETINAL DISEASE
F420z00 DIABETIC RETINOPATHY NOS
F440700 DIABETIC IRITIS
F464000 DIABETIC CATARACT
G73y000 DIABETIC PERIPHERAL ANGIOPATHY
K01x100 NEPHROTIC SYNDROME IN DIABETES MELLITUS
M037200 CELLULITIS IN DIABETIC FOOT
M271000 ISCHAEMIC ULCER DIABETIC FOOT
M271100 NEUROPATHIC DIABETIC ULCER - FOOT
M271200 MIXED DIABETIC ULCER - FOOT
N030000 DIABETIC CHEIROARTHROPATHY
N030011 DIABETIC CHEIROPATHY
N030100 DIABETIC CHARCOT ARTHROPATHY
Q441.00 NEONATAL DIABETES MELLITUS
R054200 [D]GANGRENE OF TOE IN DIABETIC
R054300 [D]WIDESPREAD DIABETIC FOOT GANGRENE
ZC2C800 DIETARY ADVICE FOR DIABETES MELLITUS
ZC2CA00 DIETARY ADVICE FOR TYPE II DIABETES
ZL22500 UNDER CARE OF DIABETIC LIAISON NURSE
ZV65312 [V]DIETARY COUNSELLING IN DIABETES MELLITUS
ZV6DA00 [V]ADMITTED FOR COMMENCEMENT OF INSULIN
ZV6DB00 [V]ADMITTED FOR CONVERSION TO INSULIN
13B1.00 Diabetic diet
U602300 [X]Insul/oral hypoglyc drugs caus adverse eff therapeut use
8A17.00 Self monitoring of blood glucose
8A18.00 Self monitoring of urine glucose+
C11y000 Steroid induced diabetes
C100100 DIABETES MELLITUS, ADULT ONSET, NO MENTION OF COMPLICATION
C100111 MATURITY ONSET DIABETES
C100112 NON-INSULIN DEPENDENT DIABETES MELLITUS
C101100 DIABETES MELLITUS, ADULT ONSET, WITH KETOACIDOSIS
C102100 DIABETES MELLITUS, ADULT ONSET, WITH HYPEROSMOLAR COMA
C103100 DIABETES MELLITUS, ADULT ONSET, WITH KETOACIDOTIC COMA
C104100 DIABETES MELLITUS, ADULT ONSET, WITH RENAL MANIFESTATION
C105100 DIABETES MELLITUS, ADULT ONSET, + OPHTHALMIC MANIFESTATION
C106100 DIABETES MELLITUS, ADULT ONSET, + NEUROLOGICAL MANIFESTATION
C107100 DIABETES MELLITUS, ADULT, + PERIPHERAL CIRCULATORY DISORDER
C107200 DIABETES MELLITUS, ADULT WITH GANGRENE
C107400 NIDDM WITH PERIPHERAL CIRCULATORY DISORDER
C109.00 NON-INSULIN-DEPENDENT DIABETES MELLITUS
C109.11 NIDDM - NON-INSULIN DEPENDENT DIABETES MELLITUS
C109.12 TYPE 2 DIABETES MELLITUS
C109.13 TYPE II DIABETES MELLITUS
C109000 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH RENAL COMPS
C109011 TYPE II DIABETES MELLITUS WITH RENAL COMPLICATIONS
C109012 TYPE 2 DIABETES MELLITUS WITH RENAL COMPLICATIONS
C109100 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH OPHTHALM COMPS
C109111 TYPE II DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
C109112 TYPE 2 DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
C109200 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH NEURO COMPS

C109211 TYPE II DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
C109212 TYPE 2 DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
C109300 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH MULTIPLE COMPS
C109400 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH ULCER
C109411 TYPE II DIABETES MELLITUS WITH ULCER
C109412 TYPE 2 DIABETES MELLITUS WITH ULCER
C109500 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH GANGRENE
C109511 TYPE II DIABETES MELLITUS WITH GANGRENE
C109600 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH RETINOPATHY
C109611 TYPE II DIABETES MELLITUS WITH RETINOPATHY
C109612 TYPE 2 DIABETES MELLITUS WITH RETINOPATHY
C109700 NON-INSULIN DEPENDANT DIABETES MELLITUS - POOR CONTROL
C109711 TYPE II DIABETES MELLITUS - POOR CONTROL
C109712 TYPE 2 DIABETES MELLITUS - POOR CONTROL
C109900 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITHOUT COMPLICATION
C109A00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH MONONEUROPATHY
C109B00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH POLYNEUROPATHY
C109B11 TYPE II DIABETES MELLITUS WITH POLYNEUROPATHY
C109C00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH NEPHROPATHY
C109C11 TYPE II DIABETES MELLITUS WITH NEPHROPATHY
C109C12 TYPE 2 DIABETES MELLITUS WITH NEPHROPATHY
C109D00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH HYPOGLYCA COMA
C109D11 TYPE II DIABETES MELLITUS WITH HYPOGLYCAEMIC COMA
C109D12 TYPE 2 DIABETES MELLITUS WITH HYPOGLYCAEMIC COMA
C109E00 NON-INSULIN DEPEND DIABETES MELLITUS WITH DIABETIC CATARACT
C109E11 TYPE II DIABETES MELLITUS WITH DIABETIC CATARACT
C109E12 TYPE 2 DIABETES MELLITUS WITH DIABETIC CATARACT
C109F00 NON-INSULIN-DEPENDENT D M WITH PERIPHERAL ANGIOPATH
C109F11 TYPE II DIABETES MELLITUS WITH PERIPHERAL ANGIOPATHY
C109F12 TYPE 2 DIABETES MELLITUS WITH PERIPHERAL ANGIOPATHY
C109G00 NON-INSULIN DEPENDENT DIABETES MELLITUS WITH ARTHROPATHY
C109G11 TYPE II DIABETES MELLITUS WITH ARTHROPATHY
C109H00 NON-INSULIN DEPENDENT D M WITH NEUROPATHIC ARTHROPATHY
C109H11 TYPE II DIABETES MELLITUS WITH NEUROPATHIC ARTHROPATHY
C109H12 TYPE 2 DIABETES MELLITUS WITH NEUROPATHIC ARTHROPATHY
C109J00 INSULIN TREATED TYPE 2 DIABETES MELLITUS
C109J11 INSULIN TREATED NON-INSULIN DEPENDENT DIABETES MELLITUS
C109J12 INSULIN TREATED TYPE II DIABETES MELLITUS
C109K00 HYPEROSMOLAR NON-KETOTIC STATE IN TYPE 2 DIABETES MELLITUS
C10D.00 DIABETES MELLITUS AUTOSOMAL DOMINANT TYPE 2
C10D.11 MATURITY ONSET DIABETES IN YOUTH TYPE 2
C10F.00 TYPE 2 DIABETES MELLITUS
C10F.11 TYPE II DIABETES MELLITUS
C10F000 TYPE 2 DIABETES MELLITUS WITH RENAL COMPLICATIONS
C10F100 TYPE 2 DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
C10F200 TYPE 2 DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
C10F300 TYPE 2 DIABETES MELLITUS WITH MULTIPLE COMPLICATIONS
C10F400 TYPE 2 DIABETES MELLITUS WITH ULCER
C10F500 TYPE 2 DIABETES MELLITUS WITH GANGRENE
C10F600 TYPE 2 DIABETES MELLITUS WITH RETINOPATHY
C10F700 TYPE 2 DIABETES MELLITUS - POOR CONTROL

C10F900 TYPE 2 DIABETES MELLITUS WITHOUT COMPLICATION
C10FA00 TYPE 2 DIABETES MELLITUS WITH MONONEUROPATHY
C10FB00 TYPE 2 DIABETES MELLITUS WITH POLYNEUROPATHY
C10FC00 TYPE 2 DIABETES MELLITUS WITH NEPHROPATHY
C10FD00 TYPE 2 DIABETES MELLITUS WITH HYPOGLYCAEMIC COMA
C10FE00 TYPE 2 DIABETES MELLITUS WITH DIABETIC CATARACT
C10FF00 TYPE 2 DIABETES MELLITUS WITH PERIPHERAL ANGIOPATHY
C10FG00 TYPE 2 DIABETES MELLITUS WITH ARTHROPATHY
C10FH00 TYPE 2 DIABETES MELLITUS WITH NEUROPATHIC ARTHROPATHY
C10FJ00 INSULIN TREATED TYPE 2 DIABETES MELLITUS
C10FK00 HYPEROSMOLAR NON-KETOTIC STATE IN TYPE 2 DIABETES MELLITUS
C10FL00 TYPE 2 DIABETES MELLITUS WITH PERSISTENT PROTEINURIA
C10FL11 TYPE II DIABETES MELLITUS WITH PERSISTENT PROTEINURIA
C10FM00 TYPE 2 DIABETES MELLITUS WITH PERSISTENT MICROALBUMINURIA
C10FN00 TYPE 2 DIABETES MELLITUS WITH KETOACIDOSIS
C10FP00 TYPE 2 DIABETES MELLITUS WITH KETOACIDOTIC COMA
C10FQ00 TYPE 2 DIABETES MELLITUS WITH EXUDATIVE MACULOPATHY
C10y100 DIABETES MELLITUS, ADULT, + OTHER SPECIFIED MANIFESTATION
C10z100 DIABETES MELLITUS, ADULT ONSET, + UNSPECIFIED COMPLICATION

Acute Myocardial Infarction

323..00 ECG: MYOCARDIAL INFARCTION
3233.00 ECG: ANTERO-SEPTAL INFARCT
3234.00 ECG:POSTERIOR/INFERIOR INFARCT
3235.00 ECG: SUBENDOCARDIAL INFARCT
3236.00 ECG: LATERAL INFARCTION
323Z.00 ECG: MYOCARDIAL INFARCT NOS
889A.00 DIAB MELLIT INSULIN-GLUCOSE INFUS ACUTE MYOCARDIAL INFARCT
G30..00 ACUTE MYOCARDIAL INFARCTION
G30..13 CARDIAC RUPTURE FOLLOWING MYOCARDIAL INFARCTION (MI)
G30..15 MI - ACUTE MYOCARDIAL INFARCTION
G30..17 SILENT MYOCARDIAL INFARCTION
G300.00 ACUTE ANTEROLATERAL INFARCTION
G301.00 OTHER SPECIFIED ANTERIOR MYOCARDIAL INFARCTION
G301000 ACUTE ANTEROAPICAL INFARCTION
G301100 ACUTE ANTEROSEPTAL INFARCTION
G301z00 ANTERIOR MYOCARDIAL INFARCTION NOS
G302.00 ACUTE INFEROLATERAL INFARCTION
G303.00 ACUTE INFEROPOSTERIOR INFARCTION
G304.00 POSTERIOR MYOCARDIAL INFARCTION NOS
G305.00 LATERAL MYOCARDIAL INFARCTION NOS
G306.00 TRUE POSTERIOR MYOCARDIAL INFARCTION
G307.00 ACUTE SUBENDOCARDIAL INFARCTION
G307000 ACUTE NON-Q WAVE INFARCTION
G308.00 INFERIOR MYOCARDIAL INFARCTION NOS
G309.00 ACUTE Q-WAVE INFARCT
G30X.00 ACUTE TRANSMURAL MYOCARDIAL INFARCTION OF UNSPECIF SITE
G30y.00 OTHER ACUTE MYOCARDIAL INFARCTION
G30y000 ACUTE ATRIAL INFARCTION

G30y100 ACUTE PAPILLARY MUSCLE INFARCTION
G30y200 ACUTE SEPTAL INFARCTION
G30yz00 OTHER ACUTE MYOCARDIAL INFARCTION NOS
G30z.00 ACUTE MYOCARDIAL INFARCTION NOS
G35..00 SUBSEQUENT MYOCARDIAL INFARCTION
G31y100 MICROINFARCTION OF HEART
G350.00 SUBSEQUENT MYOCARDIAL INFARCTION OF ANTERIOR WALL
G351.00 SUBSEQUENT MYOCARDIAL INFARCTION OF INFERIOR WALL
G35X.00 SUBSEQUENT MYOCARDIAL INFARCTION OF UNSPECIFIED SITE
G30..11 Attack - heart
G30..12 Coronary thrombosis
G30..14 Heart attack
G30..16 Thrombosis - coronary
G30A.00 Mural thrombosis
G5yy600 Atrial thrombosis
G5yy700 Left ventricular thrombosis
G5yy800 Right ventricular thrombosis
G307100 Acute non-ST segment elevation myocardial infarction
G30B.00 Acute posterolateral myocardial infarction
G30X000 Acute ST segment elevation myocardial infarction
G38..00 POSTOPERATIVE MYOCARDIAL INFARCTION
G380.00 POSTOPERATIVE TRANSMURAL MYOCARDIAL INFARCTION ANTERIOR WALL
G381.00 POSTOPERATIVE TRANSMURAL MYOCARDIAL INFARCTION INFERIOR WALL
G384.00 POSTOPERATIVE SUBENDOCARDIAL MYOCARDIAL INFARCTION

Any Cardiovascular Disease

G311.00 Preinfarction syndrome
G311.11 Crescendo angina
G311.13 Unstable angina
G311.14 Angina at rest
G311100 Unstable angina
G311200 Angina at rest
G311300 Refractory angina
G311400 Worsening angina
G311500 Acute coronary syndrome
G311z00 Preinfarction syndrome NOS
G33..00 Angina pectoris
G330.00 Angina decubitus
G330000 Nocturnal angina
G330z00 Angina decubitus NOS
G331.00 Prinzmetal's angina
G331.11 Variant angina pectoris
G33z.00 Angina pectoris NOS
G33z000 Status anginosus
G33z100 Stenocardia
G33z200 Syncope anginosa
G33z300 Angina on effort

G33z400 Ischaemic chest pain
G33z600 New onset angina
G33z700 Stable angina
G33zz00 Angina pectoris NOS
Gyu3000 [X] Other forms of angina pectoris
14A5.00 H/O: angina pectoris
14AJ.00 H/O: Angina in last year
662K.00 Angina control
662K000 Angina control - good
662K100 Angina control - poor
662K200 Angina control - improving
662K300 Angina control - worsening
662Kz00 Angina control NOS
8B27.00 Antianginal therapy
G33z500 Post infarct angina
323..00 ECG: myocardial infarction
3233.00 ECG: antero-septal infarct.
3234.00 ECG: posterior/inferior infarct
3235.00 ECG: subendocardial infarct
3236.00 ECG: lateral infarction
323Z.00 ECG: myocardial infarct NOS
G30..00 Acute myocardial infarction
G300.00 Acute anterolateral infarction
G30..11 Attack - heart
G30..12 Coronary thrombosis
G30..14 Heart attack
G30..15 MI - acute myocardial infarction
G30..16 Thrombosis - coronary
G30..17 Silent myocardial infarction
G301.00 Other specified anterior myocardial infarction
G301000 Acute anteroapical infarction
G301100 Acute anteroseptal infarction
G301z00 Anterior myocardial infarction NOS
G302.00 Acute inferolateral infarction
G303.00 Acute inferoposterior infarction
G304.00 Posterior myocardial infarction NOS
G305.00 Lateral myocardial infarction NOS
G306.00 True posterior myocardial infarction
G307.00 Acute subendocardial infarction
G307000 Acute non-Q wave infarction
G307100 Acute non-ST segment elevation myocardial infarction
G308.00 Inferior myocardial infarction NOS
G309.00 Acute Q-wave infarct
G30B.00 Acute posterolateral myocardial infarction
G30X.00 Acute transmural myocardial infarction of unspecif site
G30X000 Acute ST segment elevation myocardial infarction
G30y.00 Other acute myocardial infarction
G30y000 Acute atrial infarction
G30y100 Acute papillary muscle infarction
G30y200 Acute septal infarction
G31y100 Microinfarction of heart

G30yz00	Other acute myocardial infarction NOS
G30z.00	Acute myocardial infarction NOS
G30A.00	Mural thrombosis
G5yy600	Atrial thrombosis
G5yy700	Left ventricular thrombosis
G5yy800	Right ventricular thrombosis
14A3.00	H/O: myocardial infarct <60
14A4.00	H/O: myocardial infarct >60
14AH.00	H/O: Myocardial infarction in last year
3232.00	ECG: old myocardial infarction
G32..00	Old myocardial infarction
G32..11	Healed myocardial infarction
G32..12	Personal history of myocardial infarction
G30..13	Cardiac rupture following myocardial infarction (MI)
G310.00	Postmyocardial infarction syndrome
G310.11	Dressler's syndrome
G35..00	Subsequent myocardial infarction
G350.00	Subsequent myocardial infarction of anterior wall
G351.00	Subsequent myocardial infarction of inferior wall
G353.00	Subsequent myocardial infarction of other sites
G35X.00	Subsequent myocardial infarction of unspecified site
G36..00	Certain current complication follow acute myocardial infarct
G36..00	Certain current complication follow acute myocardial infarct
G360.00	Haemopericardium/current comp folow acut myocard infarct
G361.00	Atrial septal defect/curr comp folow acut myocardal infarct
G362.00	Ventric septal defect/curr comp fol acut myocardal infarctn
G363.00	Ruptur cardiac wall w'out haemopericard/cur comp fol ac MI
G364.00	Ruptur chordae tendinae/curr comp fol acute myocard infarct
G365.00	Rupture papillary muscle/curr comp fol acute myocard infarct
G366.00	Thrombosis atrium,auric append&vent/curr comp foll acute MI
Gyu3500	[X] Subsequent myocardial infarction of other sites
Gyu3600	[X] Subsequent myocardial infarction of unspecified site
G38..00	Postoperative myocardial infarction
G380.00	Postoperative transmural myocardial infarction anterior wall
G381.00	Postoperative transmural myocardial infarction inferior wall
G382.00	Postoperative transmural myocardial infarction other sites
G383.00	Postoperative transmural myocardial infarction unspec site
G384.00	Postoperative subendocardial myocardial infarction
G38z.00	Postoperative myocardial infarction, unspecified
ZV71900	[V]Observation for suspected myocardial infarction
889A.00	Diab mellit insulin-glucose infus acute myocardial infarct
G312.00	Coronary thrombosis not resulting in myocardial infarction
G311000	Myocardial infarction aborted
G311011	MI - myocardial infarction aborted
792..00	Coronary artery operations
792..11	Coronary artery bypass graft operations
7920.00	Saphenous vein graft replacement of coronary artery
7920.11	Saphenous vein graft bypass of coronary artery
7920000	Saphenous vein graft replacement of one coronary artery
7920100	Saphenous vein graft replacement of two coronary arteries
7920200	Saphenous vein graft replacement of three coronary arteries

7920300 Saphenous vein graft replacement of four+ coronary arteries
7920y00 Saphenous vein graft replacement of coronary artery OS
7920z00 Saphenous vein graft replacement coronary artery NOS
7921.00 Other autograft replacement of coronary artery
7921.11 Other autograft bypass of coronary artery
7921000 Autograft replacement of one coronary artery NEC
7921100 Autograft replacement of two coronary arteries NEC
7921200 Autograft replacement of three coronary arteries NEC
7921300 Autograft replacement of four of more coronary arteries NEC
7921y00 Other autograft replacement of coronary artery OS
7921z00 Other autograft replacement of coronary artery NOS
7922.00 Allograft replacement of coronary artery
7922.11 Allograft bypass of coronary artery
7922000 Allograft replacement of one coronary artery
7922100 Allograft replacement of two coronary arteries
7922200 Allograft replacement of three coronary arteries
7922300 Allograft replacement of four or more coronary arteries
7922y00 Other specified allograft replacement of coronary artery
7922z00 Allograft replacement of coronary artery NOS
7924.00 Revision of bypass for coronary artery
7924000 Revision of bypass for one coronary artery
7924100 Revision of bypass for two coronary arteries
7924200 Revision of bypass for three coronary arteries
7924300 Revision of bypass for four or more coronary arteries
7924400 Revision of connection of thoracic artery to coronary artery
7924500 Revision of implantation of thoracic artery into heart
7924y00 Other specified revision of bypass for coronary artery
7924z00 Revision of bypass for coronary artery NOS
7925.00 Connection of mammary artery to coronary artery
7925.11 Creation of bypass from mammary artery to coronary artery
7925000 Double anastomosis of mammary arteries to coronary arteries
7925011 LIMA sequential anastomosis
7925012 RIMA sequential anastomosis
7925100 Double implant of mammary arteries into coronary arteries
7925200 Single anast mammary art to left ant descend coronary art
7925300 Single anastomosis of mammary artery to coronary artery NEC
7925311 LIMA single anastomosis
7925312 RIMA single anastomosis
7925400 Single implantation of mammary artery into coronary artery
7925y00 Connection of mammary artery to coronary artery OS
7925z00 Connection of mammary artery to coronary artery NOS
7926.00 Connection of other thoracic artery to coronary artery
7926000 Double anastom thoracic arteries to coronary arteries NEC
7926100 Double implant thoracic arteries into coronary arteries NEC
7926200 Single anastomosis of thoracic artery to coronary artery NEC
7926300 Single implantation thoracic artery into coronary artery NEC
7926y00 Connection of other thoracic artery to coronary artery OS
7926z00 Connection of other thoracic artery to coronary artery NOS
7927.00 Other open operations on coronary artery
7927000 Repair of arteriovenous fistula of coronary artery
7927100 Repair of aneurysm of coronary artery

7927200 Transection of muscle bridge of coronary artery
7927300 Transposition of coronary artery NEC
7927400 Exploration of coronary artery
7927y00 Other specified other open operation on coronary artery
7927z00 Other open operation on coronary artery NOS
7927500 Open angioplasty of coronary artery
7928.00 Transluminal balloon angioplasty of coronary artery
7928.11 Percutaneous balloon coronary angioplasty
7928000 Percut transluminal balloon angioplasty one coronary artery
7928100 Percut translum balloon angioplasty mult coronary arteries
7928200 Percut translum balloon angioplasty bypass graft coronary a
7928300 Percut translum cutting balloon angioplasty coronary artery
7928y00 Transluminal balloon angioplasty of coronary artery OS
7928z00 Transluminal balloon angioplasty of coronary artery NOS
7929.00 Other therapeutic transluminal operations on coronary artery
7929000 Percutaneous transluminal laser coronary angioplasty
7929100 Percut transluminal coronary thrombolysis with streptokinase
7929111 Percut translum coronary thrombolytic therapy- streptokinase
7929200 Percut translum inject therap subst to coronary artery NEC
7929300 Rotary blade coronary angioplasty
7929400 Insertion of coronary artery stent
7929500 Insertion of drug-eluting coronary artery stent
7929600 Percutaneous transluminal atherectomy of coronary artery
7929y00 Other therapeutic transluminal op on coronary artery OS
7929z00 Other therapeutic transluminal op on coronary artery NOS
793G.00 Perc translumin balloon angioplasty stenting coronary artery
793G000 Perc translum ball angio insert 1-2 drug elut stents cor art
793G100 Perc tran ball angio ins 3 or more drug elut stents cor art
793G200 Perc translum balloon angioplasty insert 1-2 stents cor art
793G300 Percutaneous cor balloon angiop 3 more stents cor art NEC
793Gz00 Perc translum balloon angioplasty stenting coronary art NOS
792B.00 Repair of coronary artery NEC
792B000 Endarterectomy of coronary artery NEC
792B100 Repair of rupture of coronary artery
792B200 Repair of arteriovenous malformation of coronary artery
792By00 Other specified repair of coronary artery
792Bz00 Repair of coronary artery NOS
792C.00 Other replacement of coronary artery
792C000 Replacement of coronary arteries using multiple methods
792Cy00 Other specified replacement of coronary artery
792Cz00 Replacement of coronary artery NOS
792D.00 Other bypass of coronary artery
792Dy00 Other specified other bypass of coronary artery
792Dz00 Other bypass of coronary artery NOS
792y.00 Other specified operations on coronary artery
792z.00 Coronary artery operations NOS
790H300 Revascularisation of wall of heart
ZV45800 [V]Presence of coronary angioplasty implant and graft
ZV45L00 [V]Status following coronary angioplasty NOS
SP07600 Coronary artery bypass graft occlusion
ZV45K00 [V]Presence of coronary artery bypass graft

ZV45K11 [V]Presence of coronary artery bypass graft – CABG
G31..00 Other acute and subacute ischaemic heart disease
G31y.00 Other acute and subacute ischaemic heart disease
G31y.00 Other acute and subacute ischaemic heart disease
G31y000 Acute coronary insufficiency
G31y100 Microinfarction of heart
G31y200 Subendocardial ischaemia
G31y300 Transient myocardial ischaemia
G31yz00 Other acute and subacute ischaemic heart disease NOS
G34y.00 Other specified chronic ischaemic heart disease
G34y000 Chronic coronary insufficiency
G34y100 Chronic myocardial ischaemia
G34yz00 Other specified chronic ischaemic heart disease NOS
G34z.00 Other chronic ischaemic heart disease NOS
G34z000 Asymptomatic coronary heart disease
G3...00 Ischaemic heart disease
G3...13 IHD – Ischaemic heart diease
G3y..00 Other specified ischaemic heart disease
G3z..00 Ischaemic heart disease NOS
G34..00 Other chronic ischaemic heart diease
G343.00 Ischaemic cardiomyopathy
G344.00 Silent myocardial ischaemia
G3...12 Atherosclerotic heart disease
G3...11 Arteriosclerotic heart disease
G342.00 Atherosclerotic cardiovascular disease
G5y2.00 Cardiovascular arteriosclerosis unspecified
G34..00 Other chronic ischaemic heart disease
G340.00 Coronary atherosclerosis
G340.11 Triple vessel disease of the heart
G340.12 Coronary artery disease
G340000 Single coronary vessel disease
G340100 Double coronary vessel disease
G670.00 Cerebral atherosclerosis
G670.11 Precerebral atherosclerosis
G70..00 Atherosclerosis
G70..11 Arteriosclerosis
G700.00 Aortic atherosclerosis
G700.11 Aorto-iliac disease
G701.00 Renal artery atherosclerosis
G702.00 Extremity artery atheroma
G702000 Monckeberg's medial sclerosis
G702z00 Extremity artery atheroma NOS
G70y.00 Other specified artery atheroma
G70y000 Carotid artery atherosclerosis
G70y011 Carotid artery disease
G70z.00 Arteriosclerotic vascular disease NOS
Gyu7000 [X]Atherosclerosis of other arteries
G58..00 Heart failure
G58..11 Cardiac failure
G580.00 Congestive heart failure
G580.11 Congestive cardiac failure

G580.12 Right heart failure
G580.13 Right ventricular failure
G580.14 Biventricular failure
G580000 Acute congestive heart failure
G580100 Chronic congestive heart failure
G580200 Decompensated cardiac failure
G580300 Compensated cardiac failure
G581.00 Left ventricular failure
G581.11 Asthma - cardiac
G581.12 Pulmonary oedema - acute
G581.13 Impaired left ventricular function
G581000 Acute left ventricular failure
G582.00 Acute heart failure
G58z.00 Heart failure NOS
G58z.11 Weak heart
G58z.12 Cardiac failure NOS
G5y3.00 Cardiomegaly
G5y3.11 Dilatation - cardiac
G5y3000 Atrial dilatation
G5y3100 Ventricular dilatation
G5y3200 Cardiac dilatation NOS
G5y3300 Atrial hypertrophy
G5y3400 Ventricular hypertrophy
G5y3411 Left ventricular hypertrophy
G5y3500 Cardiac hypertrophy NOS
G5y3z00 Cardiomegaly NOS
8B29.00 Cardiac failure therapy
R2y1000 [D]Cardiorespiratory failure
324..00 ECG:left ventricle hypertrophy
325..00 ECG:right ventricle hypertrop.
G232.00 Hypertensive heart&renal dis wth (congestive) heart failure
G234.00 Hyperten heart&renal dis+both(congestv) heart and renal fai
G21z011 Cardiomegaly - hypertensive
G31y000 Acute coronary insufficiency
G34y000 Chronic coronary insufficiency
G1yz100 Rheumatic left ventricular failure
SP11111 Heart failure as a complication of care
SP11200 Cardiorespiratory failure as a complication of care
SP11100 Cardiac insufficiency as a complication of care
P6yy200 Congenital cardiomegaly
Q48y100 Congenital cardiac failure
Q490.00 Neonatal cardiac failure
14A6.00 H/O: heart failure
14AM.00 H/O: Heart failure in last year

Congestive Heart Failure

G58..00 Heart failure
G58..11 Cardiac failure
G580.00 Congestive heart failure
G580.11 Congestive cardiac failure

G580.12 Right heart failure
G580.13 Right ventricular failure
G580.14 Biventricular failure
G580000 Acute congestive heart failure
G580100 Chronic congestive heart failure
G580200 Decompensated cardiac failure
G580300 Compensated cardiac failure
G581.00 Left ventricular failure
G581.11 Asthma - cardiac
G581.12 Pulmonary oedema - acute
G581.13 Impaired left ventricular function
G581000 Acute left ventricular failure
G582.00 Acute heart failure
G58z.00 Heart failure NOS
G58z.11 Weak heart
G58z.12 Cardiac failure NOS
G5y3.00 Cardiomegaly
G5y3.11 Dilatation - cardiac
G5y3000 Atrial dilatation
G5y3100 Ventricular dilatation
G5y3200 Cardiac dilatation NOS
G5y3300 Atrial hypertrophy
G5y3400 Ventricular hypertrophy
G5y3411 Left ventricular hypertrophy
G5y3500 Cardiac hypertrophy NOS
G5y3z00 Cardiomegaly NOS
8B29.00 Cardiac failure therapy
R2y1000 [D]Cardiorespiratory failure
324..00 ECG:left ventricle hypertrophy
325..00 ECG:right ventricle hypertrop.
G232.00 Hypertensive heart&renal dis wth (congestive) heart failure
G234.00 Hyperten heart&renal dis+both(congestv) heart and renal fai
G21z011 Cardiomegaly - hypertensive
G31y000 Acute coronary insufficiency
G34y000 Chronic coronary insufficiency
G1yz100 Rheumatic left ventricular failure
SP11111 Heart failure as a complication of care
SP11200 Cardiorespiratory failure as a complication of care
SP11100 Cardiac insufficiency as a complication of care
P6yy200 Congenital cardiomegaly
Q48y100 Congenital cardiac failure
Q490.00 Neonatal cardiac failure
14A6.00 H/O: heart failure
14AM.00 H/O: Heart failure in last year

Peripheral Vascular Disease

RG73..00 Other peripheral vascular disease
RG73..11 Peripheral ischaemic vascular disease
RG73..12 Ischaemia of legs

RG73..13 Peripheral ischaemia
RG731.00 Thromboangiitis obliterans
RG731000 Buerger's disease
RG731100 Presenile gangrene
RG731z00 Thromboangiitis obliterans NOS
RG73y.00 Other specified peripheral vascular disease
RG73y000 Diabetic peripheral angiopathy
RG73y100 Peripheral angiopathic disease EC NOS
RG73y200 Acrocyanosis
RG73y400 Acroparaesthesia - Schultze's type
RG73y600 Acroparaesthesia - unspecified
RG73y700 Erythrocyanosis
RG73y800 Erythromelalgia
RG73y811 Erythralgia
RG73yz00 Other specified peripheral vascular disease NOS
RG73z.00 Peripheral vascular disease NOS
RG73z000 Intermittent claudication
RG73z011 Claudication
RG73z100 Spasm of peripheral artery
RG73zz00 Peripheral vascular disease NOS

Transient Ischemic Attack / Stroke

G63..00 Precerebral arterial occlusion
G63..11 Infarction - precerebral
G63..12 Stenosis of precerebral arteries
G630.00 Basilar artery occlusion
G631.00 Carotid artery occlusion
G631.11 Stenosis, carotid artery
G631.12 Thrombosis, carotid artery
G632.00 Vertebral artery occlusion
G634.00 Carotid artery stenosis
G63y.00 Other precerebral artery occlusion
G63y000 Cerebral infarct due to thrombosis of precerebral arteries
G63y100 Cerebral infarction due to embolism of precerebral arteries
G63z.00 Precerebral artery occlusion NOS
G64..00 Cerebral arterial occlusion
G64..11 CVA - cerebral artery occlusion
G64..12 Infarction - cerebral
G64..13 Stroke due to cerebral arterial occlusion
G640.00 Cerebral thrombosis
G640000 Cerebral infarction due to thrombosis of cerebral arteries
G641.00 Cerebral embolism
G641.11 Cerebral embolus
G641000 Cerebral infarction due to embolism of cerebral arteries
G64z.00 Cerebral infarction NOS
G64z.11 Brainstem infarction NOS
G64z.12 Cerebellar infarction
G64z000 Brainstem infarction
G64z100 Wallenberg syndrome
G64z111 Lateral medullary syndrome

G64z200 Left sided cerebral infarction
G64z300 Right sided cerebral infarction
G64z400 Infarction of basal ganglia
G65..00 Transient cerebral ischaemia
G65..11 Drop attack
G65..12 Transient ischaemic attack
G65..13 Vertebro-basilar insufficiency
G650.00 Basilar artery syndrome
G650.11 Insufficiency - basilar artery
G651.00 Vertebral artery syndrome
G651000 Vertebro-basilar artery syndrome
G652.00 Subclavian steal syndrome
G653.00 Carotid artery syndrome hemispheric
G654.00 Multiple and bilateral precerebral artery syndromes
G655.00 Transient global amnesia
G656.00 Vertebrobasilar insufficiency
G65y.00 Other transient cerebral ischaemia
G65z.00 Transient cerebral ischaemia NOS
G65z000 Impending cerebral ischaemia
G65z100 Intermittent cerebral ischaemia
G65zz00 Transient cerebral ischaemia NOS
G66..00 Stroke and cerebrovascular accident unspecified
G66..11 CVA unspecified
G66..12 Stroke unspecified
G66..13 CVA - Cerebrovascular accident unspecified
G660.00 Middle cerebral artery syndrome
G661.00 Anterior cerebral artery syndrome
G662.00 Posterior cerebral artery syndrome
G663.00 Brain stem stroke syndrome
G664.00 Cerebellar stroke syndrome
G665.00 Pure motor lacunar syndrome
G666.00 Pure sensory lacunar syndrome
G667.00 Left sided CVA
G668.00 Right sided CVA
G669.00 Cerebral palsy, not congenital or infantile, acute
G680.00 Sequelae of subarachnoid haemorrhage
G681.00 Sequelae of intracerebral haemorrhage
G682.00 Sequelae of other nontraumatic intracranial haemorrhage
G683.00 Sequelae of cerebral infarction
G68W.00 Sequelae/other + unspecified cerebrovascular diseases
G68X.00 Sequelae of stroke,not specfd as h'morrhage or infarction
G6W..00 Cereb infarct due unsp occlus/stenos precerebr arteries
G6X..00 Cerebrl infarctn due/unspcf occlusn or sten/cerebrl artrs

Chronic Liver Disease

A707.00 CHRONIC VIRAL HEPATITIS
A707000 CHRONIC VIRAL HEPATITIS B WITH DELTA-AGENT
A707100 CHRONIC VIRAL HEPATITIS B WITHOUT DELTA-AGENT
A707200 CHRONIC VIRAL HEPATITIS C

A707X00 CHRONIC VIRAL HEPATITIS, UNSPECIFIED
C310400 GLYCOGENOSIS WITH HEPATIC CIRRHOSIS
J61..00 CIRRHOSIS AND CHRONIC LIVER DISEASE
J610.00 ALCOHOLIC FATTY LIVER
J612.00 ALCOHOLIC CIRRHOSIS OF LIVER
J612.11 FLORID CIRRHOSIS
J612.12 LAENNEC'S CIRRHOSIS
J612000 ALCOHOLIC FIBROSIS AND SCLEROSIS OF LIVER
J613.00 ALCOHOLIC LIVER DAMAGE UNSPECIFIED
J613000 ALCOHOLIC HEPATIC FAILURE
J614.00 CHRONIC HEPATITIS
J614000 CHRONIC PERSISTENT HEPATITIS
J614100 CHRONIC ACTIVE HEPATITIS
J614111 AUTOIMMUNE CHRONIC ACTIVE HEPATITIS
J614200 CHRONIC AGGRESSIVE HEPATITIS
J614300 RECURRENT HEPATITIS
J614400 CHRONIC LOBULAR HEPATITIS
J614y00 CHRONIC HEPATITIS UNSPECIFIED
J614z00 CHRONIC HEPATITIS NOS
J615.00 CIRRHOSIS - NON ALCOHOLIC
J615.11 PORTAL CIRRHOSIS
J615000 UNILOBULAR PORTAL CIRRHOSIS
J615100 MULTILOBULAR PORTAL CIRRHOSIS
J615111 POSTNECROTIC CIRRHOSIS OF LIVER
J615200 MIXED PORTAL CIRRHOSIS
J615300 DIFFUSE NODULAR CIRRHOSIS
J615400 FATTY PORTAL CIRRHOSIS
J615500 HYPERTROPHIC PORTAL CIRRHOSIS
J615600 CAPSULAR PORTAL CIRRHOSIS
J615700 CARDIAC PORTAL CIRRHOSIS
J615711 CONGESTIVE CIRRHOSIS
J615800 JUVENILE PORTAL CIRRHOSIS
J615811 CHILDHOOD FUNCTION CIRRHOSIS
J615812 INDIAN CHILDHOOD CIRRHOSIS
J615900 PIGMENTARY PORTAL CIRRHOSIS
J615A00 PIPE-STEM PORTAL CIRRHOSIS
J615B00 TOXIC PORTAL CIRRHOSIS
J615C00 XANTHOMATOUS PORTAL CIRRHOSIS
J615D00 BACTERIAL PORTAL CIRRHOSIS
J615E00 CARDITUBERCULOUS CIRRHOSIS
J615F00 SYPHILITIC PORTAL CIRRHOSIS
J615G00 ZOOPARASITIC PORTAL CIRRHOSIS
J615H00 INFECTIOUS CIRRHOSIS NOS
J615y00 PORTAL CIRRHOSIS UNSPECIFIED
J615z00 NON-ALCOHOLIC CIRRHOSIS NOS
J615z11 MACRONODULAR CIRRHOSIS OF LIVER
J615z12 CRYPTOGENIC CIRRHOSIS OF LIVER
J615z13 CIRRHOSIS OF LIVER NOS
J615z14 LAENNEC'S CIRRHOSIS, NON-ALCOHOLIC
J615z15 HEPATIC FIBROSIS
J616.00 BILIARY CIRRHOSIS

J616000 PRIMARY BILIARY CIRRHOSIS
J616100 SECONDARY BILIARY CIRRHOSIS
J616200 BILIARY CIRRHOSIS OF CHILDREN
J616z00 BILIARY CIRRHOSIS NOS
J617000 CHRONIC ALCOHOLIC HEPATITIS
J61y.00 OTHER NON-ALCOHOLIC CHRONIC LIVER DISEASE
J61y000 CHRONIC YELLOW LIVER ATROPHY
J61y100 NON-ALCOHOLIC FATTY LIVER
J61y700 STEATOSIS OF LIVER
J61yz00 OTHER NON-ALCOHOLIC CHRONIC LIVER DISEASE NOS
J61z.00 CHRONIC LIVER DISEASE NOS
J62..00 LIVER ABSCESS AND SEQUELAE OF CHRONIC LIVER DISEASE
J625.00 [X] HEPATIC FAILURE
J625.11 [X] LIVER FAILURE
J62y.00 OTHER SEQUELAE OF CHRONIC LIVER DISEASE
J62y.11 HEPATIC FAILURE NOS
J62y.12 LIVER FAILURE NOS
J62y.13 HEPATIC FAILURE
J62z.00 LIVER ABSCESS AND CHRONIC LIVER DISEASE CAUSING SEQUELAE NOS
J635300 TOXIC LIVER DISEASE WITH CHRONIC PERSISTENT HEPATITIS
J635400 TOXIC LIVER DISEASE WITH CHRONIC LOBULAR HEPATITIS
J635500 TOXIC LIVER DISEASE WITH CHRONIC ACTIVE HEPATITIS
J635600 TOXIC LIVER DISEASE WITH FIBROSIS AND CIRRHOSIS OF LIVER
SP14200 HEPATIC FAILURE AS A COMPLICATION OF CARE
SP14211 LIVER FAILURE AS A COMPLICATION OF CARE

Venous Thromboembolism (both deep venous thrombosis and pulmonary embolism)

G801.11 Deep vein thrombosis
G801.12 Deep vein thrombosis, leg
G801.13 DVT - Deep vein thrombosis
G822.00 Embolism and thrombosis of the vena cava
G80y.11 Phlebitis and/or thrombophlebitis of iliac vein
G80y200 Phlebitis of the external iliac vein
G80y400 Thrombophlebitis of the common iliac vein
G80y600 Thrombophlebitis of the external iliac vein
G80y800 Phlebitis and thrombophlebitis of the iliac vein
G801.00 Deep vein phlebitis and thrombophlebitis of the leg
G801000 Phlebitis of the femoral vein
G801100 Phlebitis of the popliteal vein
G801200 Phlebitis of the anterior tibial vein
G801400 Phlebitis of the posterior tibial vein
G801500 Deep vein phlebitis of the leg unspecified
G801600 Thrombophlebitis of the femoral vein
G801700 Thrombophlebitis of the popliteal vein
G801A00 Thrombophlebitis of the posterior tibial vein
G801B00 Deep vein thrombophlebitis of the leg unspecified
G801z00 Deep vein phlebitis and thrombophlebitis of the leg NOS
G401.00 Pulmonary embolism
G401.12 Pulmonary embolus

Oral Hypoglycemic Agents

ORAL ANTIDIABETICS_sulfonylureas
2108 Acetohexamide
2110 Tolazamide
2115 Tolbutamide
2116 Glibenclamide (aka Glyburide)
2133 Glibornuride
2139 Glipizide
2148 Gliclazide
2159 Glimepiride
2140 Gliquidone
2120 Chlorpropamide

ORAL ANTIDIABETICS_Acarbose
2157 Acarbose

ORAL ANTIDIABETICS_Biguanides
2122 Metformin

ORAL ANTIDIABETICS_Glinides
2161 Repaglinide
2165 Nateglinide

Dipeptidyl peptidase 4 inhibitors
1079 SITAGLIPTIN

Oral Antidiabetics_PPAR agonists
2163 ROSIGLITAZONE
2167 ROSIGLITAZONE AND METFORMIN
2160 TROGLITAZONE
2162 PIOGLITAZONE
51050 ROSIGLITAZONE + GLIMEPIRIDE
51067 PIOGLITAZONE / METFORMIN

Insulin

2103 INSULIN
2109 (CZI CRYSTILLIN ZINC INSULIN
2111 INSULIN ZINC SUSPENSION
2112 INSULIN ZINC SUSPENSION EXTENDED
2125 DEPOT-INSULIN CS
2128 GLOBIN ZINC INSULIN INJECTION
2129 KOMB-INSULIN
2136 INSULIN NOVO-RAPITARD
2138 INSULIN LEO
2141 LONG INSULIN
2144 INSULIN CS

2151 INSULIN HUM NPH W ISOPHANE
2154 INSULIN HUM NPH W NEUTRAL/SOLUBLE

2158 PRO-HUMAN INSULIN LISPRO
16221 INSULINS & ORAL ANTIDIABETIC AGENTS
51007 INSULIN PORC ZINK / LENTE SEMILENTE
51008 INSULIN BEEF
02170 HUMALOG

Statins

1214 PRAVASTATIN
1217 FLUVASTATIN
1218 ATORVASTATIN
1219 CERIVASTATIN
1220 SIMVASTATIN
1221 ROSUVASTATIN CALCIUM
1222 EZETIMIBE + SIMVASTATIN
19103 SIMVASTATIN
1212 LOVASTATIN

Antihypertensive Agents

ACE-inhibitors_P
2202 IMIDAPRIL HCL
4555 CAPTOPRIL
4559 ENALAPRIL
4566 LISINOPRIL
4574 PERINDOPRIL
4575 RAMIPRIL
4578 CILAZAPRIL
4580 FOSINOPRIL
4592 MOEXIPRIL
4609 TRANDOLAPRIL
5776 QUINAPRIL
4584 Benazepril

ACE-inhibitor combinations
4618 PERINDOPRIL + INDAPAMIDE

ACE-inhibitors and diuretics
4569 CAPTOPRIL W HYDROCHLORTH
4577 LISINOPRIL W HYDROCHLORO
4581 ENALAPRIL W HYDROCHLOROT
4590 benazepril hydrochlorothiazide

ACE-inhibitors and calcium channel blockers
4598 FELODIPINE+RAMIPRIL

Angiotensin II antagonists
4589 LOSARTAN
4596 VALSARTAN
4615 TELMISARTAN
4617 EPROSARTAN
6202 AMIAS (=Candesartan)
6203 APROVEL (= Irbesartan)
24518 OLMESARTAN MEDOXOMIL

Angiotensin II inhibitors and diuretics
4595 COZAAR-COMP
6207 IRBESARTAN+HYDROCHLOROTH

Beta-blockers incl. Combination with diuretics
1320 ACEBUTOLOL HCL
1321 TIMOLOL MALEATE
1326 ATENOLOL
4561 ATENOLOL W CHLORTHALIDON
4562 NADOLOL W BENDROFLUMETHI
4568 ATENOLOL W NIFEDIPINE
4583 CELIPROLOL
4611 NEBIVOLOL
5710 PROPRANOLOL
5723 OXPRENOLOL HCL
5732 PINDOLOL
5754 NADOLOL
5757 CLOPAMIDE W PINDOLOL
5769 BETAXOLOL
5770 TIMOLOL,AMILORIDE,HYDROC
5773 OXPRENOLOL W CYCLOPENTHI
5778 ESMOLOL
6140 METOPROLOL
6178 PROPRANOLOL W BENDROFLUA
6180 METOPROLOL W HYDROCHLORO
6182 METOPROLOL W CHLORTHALID
6184 SOTALOL W HYDROCHLOROTHI
6185 TIMOLOL W BENDROFLUAZIDE
6188 BISOPROLOL FUMARATE
6191 CARTEOLOL HCL TABLETS
6196 BISOPROLOLFUMARATE W HYD
6798 AMILORIDE,ATENOLOL,HYDRO
16704 FUROSEMIDE W PENBUTOLOL
6164 LABETALOL HCL
6166 SOTALOL HCL
6198 CARVEDILOL
6797 HYDROCHLOROTHIAZIDE W AC
4594 TENBEN
4599 HYDROCHLOROTHIAZIDE+TIMO
5731 alprenolol
6160 bupranolol hcl

1327 penbutolol
16704 furosemide w penbutolol

Calcium channel blockers
4579 FELODIPINE SR
4587 LACIDIPINE
4591 DILTIATEM + HYDROCHLOROT
4597 NISOLDIPINE
4598 FELODIPINE+RAMIPRIL
4607 ISRADIPINE
5733 VERAPAMIL
5779 VERAPAMIL HCL 180MG/2MG
6136 AMLODIPINE
6145 NIFEDIPINE
6148 PERHEXILINE MALEATE
6156 LIDOFLAZINE
6175 DILTIAZEM
6189 NIMODIPINE
6187 NICARDIPINE
6204 ZANIDIP
6205 MIBEFRADIL

Diuretics

Thiazides
6716 Bendrofluazide
4527 Benzthiazide
6746 Chlorothiazide
6734 Hydrochlorothiazide
4524 Cyclopenthiazide
6737 Polythiazide
6742 Chlorthalidone (thiazide-like)
6574 Mefruside (thiazide-like)
6770 Xipamide (thiazide-like)
6758 Metolazone
6748 Hydroflumethiazide
6764 Clopamide
16703 Clopamide with potassium
4554 Indapamide

Loop diuretics
6718 Furosemide
6756 Bumetanide
16711 Torasemide
6720 Ethacrynic acid

Kalium-sparing diuretics
6719 Triamterene
6753 Amiloride
6701 Spironolactone
6420 Metyrapone

Diuretics/combinations
6702 Acetazolamide
16710 Bumetanide + amiloride
6794 Furosemide + amiloride
6795 Furosemide + triamterene
6785 Chlorthalidone + triamterene
6721 Hydrochlorothiazide + triamterene
6796 Furosemide + spironolactone
6717 SPIRONOLACTONE W HYDROCHLOROTHIAZIDE
6763 Spironolactone + thiazides
6750 Amiloride + hydrochlorothiazide
4576 Amiloride + cyclopenthiazide

Thiazides with antihypertensives
4561 ATENOLOL W CHLORTHALIDONE
6798 AMILORIDE,ATENOLOL,HYDROCHLOROTHIAZIDE

4594 Atenolol
6797 Acebutolol
6196 Bisoprolol
4562 Nadolol
5773 Oxprenolol
5757 Pindolol
5770 TIMOLOL,AMILORIDE,HYDROCHLORTHIAZIDE
6185 Timolol
4556 PROPRANOLOL W HYDROCHLORTHIAZIDE
6178 Propranolol
6180 METOPROLOL W HYDROCHLOROTHIAZIDE
6182 Metoprolol
6184 Sotalol
4569 Captopril
4581 Enalaparil
4608 Quinapril
4577 Lisinopril
4591 Diltiazem
4515 RESERPINE W HYDROCHLOROTHIAZIDE PLUS
4525 CYCLOPENTHIAZIDE W POTASSIUM CHLORIDE
4517 METHYLCLOTHIAZIDE W DESERPIDINE
4530 CYCLOPENTHIAZIDE,RESERPINE,POTASSIUM CHLORIDE
4532 GUANETHIDINE,CYCLOPENTHIAZIDE,POTASSIUM CHLORIDE
4536 HYDROFLUMETHIAZIDE,KCL,RAUWOLFIA,SERPENTHE
4539 GUANETHIDINE W HYDROCHLOROTHIAZIDE
4544 BUTABARBITAL,HYDROCHLOROTHIAZIDE,RESERPINE
4552 CLONIDINE W CHLORTHIAZIDE
4557 HYDRALAZINE W HYDROCHLOROTHIAZIDE
4564 METHOSERPIDINE W BENZTHIAZIDE
4582 LISINOPRIL W HYDROCHLOROTHIAZIDE
4585 ALKAVERVIR W EPITHIAZIDE
4590 BENAZEPRIL, HYDROCHLOROTHIAZIDE
4599 HYDROCHLOROTHIAZIDE+TIMOLOL+AMILORIDE

4601 METHYLDOPA W HYDROCHLOROTHIAZIDE
4602 (METHYLCLOTHIAZIDE W DESERPIDINE
4603 METHYLDOPA W CHLOROTHIAZIDE
6146 RESERPIN,DIHYDRALAZINE,HYDROCHLOROTHIAZIDE,KCL
6207 IRBESARTAN+HYDROCHLOROTHIAZIDE
6707 HYDROCHLOROTHIAZIDE W POTASSIUM CHLORIDE
6711 BENDROFLUMETHIAZIDE W POTASSIUM CHLORIDE
6723 METHYLCLOTHIAZIDE
6728 BENDROFLUMETHIAZIDE,RAUWOLFIA SERP,KCL
6735 TRICHLORMETHIAZIDE
6736 HYDROCHLOROTHIAZIDE W MEPROBAMATE
6738 TRICHLOMETHIAZIDE W RESERPINE
6739 CHLOROTHIAZIDE W RESERPINE
6741 (GUANETHIDINE W HYDROCHLOROTHIAZIDE
6744 CYCLOTHIAZIDE W POTASSIUM CHLORIDE
6749 CYCLOTHIAZIDE
6750 HYDROCHLOROTHIAZIDE W AMILORIDE HCL
6762 POLYTHIAZIDE W RESERPINE
6771 BUTHIAZIDE
6783 (SPIRONOLACTONE W HYDROCHLOROTHIAZID
6789 TRIAMTERINE W BENZTHIAZIDE
6792 (AMILORIDE W HYDROCHLOROTHIAZIDE
9001 CRYPTENAMINE W METHYCLOTHIAZIDE
16701 CHLOROTHIAZIDE W SPIRONOLACTONE
16702 CHLOROTHIAZIDE W SPIRONOLACTONE,LACTOSE
16709 ETHIAZIDE
40007 HYDROCHLOROTHIAZIDE OR PLACEBO STUDY
6731 QUINETHAZONE
4545 DIHYDROERG,CLOPAMIDE,RESERPINE
5758 PINDOLOL W CLOPAMIDE
6742 CHLORTHALIDONE
6782 CHLORTHALIDONE/POT.CHLORIDE
6150 RESERPIN,MEFRUSID,INOSITONICOT
4618 PERINDOPRIL + INDAPAMIDE
6752 CLOREXOLONE
6733 MERSALYL SODIUM
9198 PHENOBARBITAL W THEOBROMINE
4551 RESERPINE W FUROSEMIDE
6768 FUROSEMIDE W POTASSIUM
6793 (FUROSEMIDE W POTASSIUM
16704 FUROSEMIDE W PENBUTOLOL
6759 BUMETANIDE W POTASSIUM CHLORIDE
4605 PIRETANIDE
6790 TIENILIC ACID
6784 ETHACRYNIC ACID W TRASICOR
6766 ETOZOLIN
6781 LASIX W SPIRONOLACTON
6783 (SPIRONOLACTONE W HYDROCHLOROTHIAZID
6786 SPIRONOLACTONE W COMBINATIONS
16701 CHLOROTHIAZIDE W SPIRONOLACTONE
16702 CHLOROTHIAZIDE W SPIRONOLACTONE,LACTOSE

16708 POTASSIUM CANRENOATE
16712 EPLERENONE
4599 HYDROCHLOROTHIAZIDE+TIMOLOL+AMILORIDE
4616 TRIAMTERINE+AMILORIDE
16710 BUMETANIDE W AMILORIDE
4616 TRIAMTERINE+AMILORIDE
6765 BEMETIZIDE W TRIAMTERENE
6789 TRIAMTERINE W BENZTHIAZIDE

Nitrates

B06106 NITROGLYCERINE EXT.RELEASE
B06127 NITROGLYCERIN
B06167 NITROGLYCERIN + ISOSORBIDEDNITRAT
B06171 NITROGLYCERIN W COMBINATIONS
B06174 NITROGLYCERINE DISC
B06176 ISOSORBIDE MONONITRATE
B06206 ISOSORBIDE MONONITRATE+ASPIRIN
B06128 ISOSORBIDE DINITRATE
B06141 SODIUM NITROPRUSSIDE
B06153 AMYL NITRITE

Antiplatelet Agents

1923 EPOPROSTENOL
1928 ABCIXIMAB
1930 CLOPIDOGREL
5528 TICLOPIDIN
6105 DIPYRIDAMOLE
6201 DIPYRIDAMOLE 200MG/ASPIR
4979 Aloxiprin
1937 Tirofiban

Appendix 2. Contract