**Observational Study Information**

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| --- | --- |
| **Acronym/Title** | OT2DSI // Observational study of type 2 diabetes and its complications: a chronological overview using the OHDSI network |
| **Protocol version and date** | v 1.0, 22 MAY 2020 |
| **IMPACT study number** | 21504 |
| **Study type / Study phase** | Observational, Phase IV |
| **Medicinal product** | No drug (Finerenone related) |
| **Study Initiator and Funder** | Bayer AG |
| **Research question and objectives** | Given certain specific complications occurring in patients with type 2 diabetes, what are the more common sequential pathways for the occurrence of such complications |
| **Country(-ies) of study** | BE, BR, FR, DE, UK, US |
| **Author** | David Vizcaya, MPH PhD |

The study will be conducted in compliance with the protocol

and any applicable regulatory requirements.

Throughout this document, symbols indicating proprietary names (®, TM) may not be displayed. Hence, the appearance of product names without these symbols does not imply that these names are not protected.

# Table of contents

[1. Table of contents 2](#_Toc40861118)

[2. List of abbreviations 4](#_Toc40861119)

[3. Responsible parties 6](#_Toc40861120)

[3.1 Study initiator and funder 6](#_Toc40861121)

[3.2 External partner 6](#_Toc40861122)

[4. Abstract 8](#_Toc40861123)

[5. Amendments 11](#_Toc40861124)

[6. Milestones 11](#_Toc40861125)

[7. Rationale and background 11](#_Toc40861126)

[8. Research questions and objectives 12](#_Toc40861127)

[8.1 Primary objective 12](#_Toc40861128)

[8.2 Secondary objectives 13](#_Toc40861129)

[9. Research methods 13](#_Toc40861130)

[9.1 Study design 13](#_Toc40861131)

[9.2 Setting 14](#_Toc40861132)

[9.2.1 Study population 15](#_Toc40861133)

[9.2.2 Study time frame 17](#_Toc40861134)

[9.2.3 Selection criteria 18](#_Toc40861135)

[9.2.4 Representativeness 18](#_Toc40861136)

[9.3 Variables 19](#_Toc40861137)

[9.3.1 Target cohort definition 19](#_Toc40861138)

[9.3.2 Outcome cohorts definition 19](#_Toc40861139)

[9.3.3 Covariate definition 106](#_Toc40861140)

[9.4 Data sources 106](#_Toc40861141)

[9.5 Study size 109](#_Toc40861142)

[9.6 Data management 109](#_Toc40861143)

[9.7 Data analysis 110](#_Toc40861144)

[9.8 Quality control 110](#_Toc40861145)

[9.9 Limitations of the research methods 110](#_Toc40861146)

[9.10 Other aspects 111](#_Toc40861147)

[9.10.1 OHDSI Network Process and Transparency 111](#_Toc40861148)

[10. Protection of human subjects 111](#_Toc40861149)

[11. Management and reporting of adverse events/adverse reactions 112](#_Toc40861150)

[12. Plans for disseminating and communicating study results 112](#_Toc40861151)

[13. References 113](#_Toc40861152)

[Annex 1: List of stand-alone documents 115](#_Toc40861153)

[Annex 2: Additional information 116](#_Toc40861154)

[Annex 3: Signature pages 117](#_Toc40861155)

[Signature Page – Study Conduct Responsible & Epidemiologist 117](#_Toc40861156)

[Signature Page – Study Safety Lead 118](#_Toc40861157)

[Signature Page – Study Medical Expert 119](#_Toc40861158)

[Signature Page – Study Health Economist & Outcomes Research (HEOR) 120](#_Toc40861159)

[Signature Page – Study Epidemiologist 121](#_Toc40861160)

[Signature Page – Study Epidemiologist 122](#_Toc40861161)

[Signature Page – Study Statistician 124](#_Toc40861162)

# List of abbreviations

ATC Anatomical Therapeutic Chemical (Classification System)

BE Belgium

BR Brazil

CCAE IBM MarketScan Commercial Claims and Encounters

CeVD Cerebrovascular Disease

CDM Common data model

CKD Chronic Kidney Disease

CPRD Clinical Practice Research Datalink

CVD Cardiovascular Disease

DA Disease Analyser

DE Germany

DNeu Diabetic Neuropathy

DR Diabetic Retinopathy´

DSUS Brazil DataSUS

EC European Commission

EHR Electronic health records

EMR Electronic medical record

EU European Union

FR France

ICD International Classification of Diseases

HEOR Health Economics and Outcomes Research

HF Heart Failure

LPD Longitudinal Patient Database

MDCR Truven MarketScan Medicare Supplemental Beneficiaries

N/A Not Applicable

OHDSI Observational Health Data Sciences and Informatics

OMOP Observational Medical Outcomes Partnership

OS Observational Study

PAD Peripheral artery disease

SUS Sistema Único de Saúde (Portugues for Unified health system)

T1D Type 1 diabetes

T2D Type 2 Diabetes

UK United Kingdom

US United States

# Responsible parties

## Study initiator and funder

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| Name: | George Argyriou |

Contact details of the responsible parties at Bayer AG and IQVIA are available upon request.

## External partner

As part of the network study, we plan to collaborate with members of the OHDSI community to run this query in their local data source. A final list of collaborators will be provided in a submitted report documenting all external study participants including contact details and database information.

# Abstract

|  |  |
| --- | --- |
| **Acronym/Title** | OT2DSI // Observational study of type 2 diabetes and its complications: a chronological overview using the OHDSI network |
| **Protocol version and date** | v 1.0, 01 MAY 2020 |
| **IMPACT study number** | 21504 |
| **Study type / Study phase** | Observational |
| **Author** | David Vizcaya |
| **Rationale and background** | Overall incidence and prevalence of diabetes have increased rapidly in the last decades mainly due to the raise in obesity and other risk factors for type 2 diabetes (T2D) ([1](#_ENREF_1)). CKD is a frequent complication of longer standing and poorer controlled diabetes mellitus and its incidence and prevalence is rising rapidly as well ([2-4](#_ENREF_2)). Other serious complications develop as a consequence of T2D due in part to micro and macrovascular damage ([5](#_ENREF_5)). Some of the more common ones are diabetic retinopathy ([6](#_ENREF_6)), diabetic neuropathy ([7](#_ENREF_7)), cardiac autonomic dysfunction ([8](#_ENREF_8)), diabetic foot ulcer ([7](#_ENREF_7)).  Although there has been extensive research in understanding these conditions in diabetic populations little is known about their specific risk factors, sequential occurrence and interactions. |
| **Research question and objectives** | The aim of this study is to identify common occurrence patterns of specific complications in patients with T2D: CKD, DR, DNeu, HF, CVD and CeVD. These patterns will be assessed by population, age at T2D diagnosis and calendar year.  The primary objective in this study is to characterize the occurrence and its ordered sequence of certain chronic conditions in adult patients with T2D by year, population (database) and age category.  Secondary objectives:   * The average time-to-event since T2D diagnosis for CKD, DR, DNeu, HF, CVD and CeVD * The incidence rate of CKD, DR, DNeu, HF, and CVD and CeVD. |
| **Study design** | This is a descriptive longitudinal retrospective study based on multiple secondary data sources mapped into a common data model (OMOP). Data sources from the following countries are in scope: US, United Kingdom, France, Germany, Brazil and Belgium. Afterwards, this study can use the OHDSI network for the remaining countries of interest (Italy and Spain and among others) to address the objectives. |
| **Population** | The study population will include patients aged 18 years or older with newly diagnosed T2D identified in routinely collected healthcare data (claims and electronic health records). At least 365 days of database history prior to the first diagnosis of T2D will be required. |
| **Variables** | **Target cohort:**  T2D-related SNOMED codes  **Outcome cohorts:**  CKD-related SNOMED codes  DR-related SNOMED codes  DNeu-related SNOMED codes  HF-related SNOMED codes  CVD-related SNOMED codes  CeVD-related SNOMED codes  **Co-variates:**  Date of diagnoses (for sequential analyses)  Age  Gender |
| **Data sources** | The study will be conducted using Bayer’s three OMOP data sources: IBM MarketScan combining commercial claims (CCAE) and Medicare (MDCR) from the US and Clinical Practice Research Datalink (CPRD) from the UK.  In addition we will use the IQVIA OMOP data assets from the United States, United Kingdom, France, Germany, Brazil and Belgium.  Upon internal study completion, we will consider extending an invitation to the OHDSI network to reproduce the study on other OMOP data sources. |
| **Study size** | The number of patients meeting the target cohort definition (patients with T2D) across each of the selected available databases are listed in section 9.5. We expect our T2D base cohort in the order of several hundred-thousands. No hypothesis test is being conducted, thus no requirement for power calculation is required. However, any estimate reported should consider the 95% confidence interval. |
| **Data analysis** | This is a descriptive study. The prevalence and incidence of T2D overall and its complications within the T2D cohort will be calculated by database, calendar year and age category. In each data source, the sequence of T2D complications of interest will be assessed for each patient and the observed sequences will be presented in sunburst graphs. Temporal trends and prognosis in T2D complications will be assessed by stratifying results by calendar year. All results will be presented per database: overall and by age category at first diagnosis of T2D: 18-49, 50-75, more than 75 years old. |
| **Milestones** | 1. Start of study: after Protocol approval (May/June 2020) 2. End of study: data is available for analysis (July 2020) 3. Final report of study results using Bayer template (July 2020) 4. The study will be extended to the OHDSI community where new milestones for the collation of external analysis and report creation will need to be established once data partners have volunteered. |

# Amendments

None

# Milestones

Table 1 presents planned milestones for the project. These milestones are based on a timely review and approval of the project. Administrative changes to milestones due to delays in study preparation, data release and analysis do not require amendments to the protocol. Revised study timelines and milestones which do not constitute a need for a formal protocol amendment are kept as stand-alone document (Table 2, Annex 1) that is available upon request.

Table 1: Milestones

|  |  |
| --- | --- |
| **Milestone** | **Planned date** |
| Start of data collection \* | 1st Jan 2000 |
| End of data collection \* | 31st Dec 2019 |
| Study progress report | *Regular progress update meetings to be arranged by Bayer & IQVIA* |
| Final report of study results | July 2020 |
| Sharing of cohort to OHDSI Network | August 2020 (as soon as cohort can be packaged and shared– network study proposal is conditional to Bayer approval) |

\*Depending on availability of data from each data source the milestone may change

# Rationale and background

Overall, incidence and prevalence of diabetes have increased rapidly in the last decades mainly due to the rise in obesity and other risk factors for type 2 diabetes mellitus (T2D) ([1](#_ENREF_1)). Despite the advances in diabetes management, there are certain complications associated with T2D that may occur throughout the course of the disease and for which incidence and prevalence are also raising([9](#_ENREF_9), [10](#_ENREF_10)). Among these, chronic kidney disease (CKD) is one of the most frequent complications of longer standing and poorer controlled type II diabetes (T2D) and its incidence and prevalence is raising rapidly as well ([2-4](#_ENREF_2)). Besides CKD, other serious complications develop as a consequence of T2D due in part to micro and macrovascular damage ([5](#_ENREF_5)). One of the more frequently occurring is diabetic retinopathy (DR) ([6](#_ENREF_6), [11](#_ENREF_11)). This severe eye condition is the first cause of incident blindness in young adults in developed countries and occurs in around a third of patients with diabetes ([6](#_ENREF_6), [12](#_ENREF_12)). Diabetic neuropathy (DNeu) is regarded as the most prevalent chronic complication of diabetes ([7](#_ENREF_7), [13](#_ENREF_13)). In its differential diagnosis, it is important to consider that other non-diabetic neuropathies might be present at the time of diabetes onset ([14](#_ENREF_14)). Beyond these microvascular conditions, diabetes may be an underlying cause of macrovascular complications affecting heart and brain vascularization ([9](#_ENREF_9)). Cardiovascular disease (CVD) can be a consequence of atherosclerotic events associated with hyperglycemia and insulin resistance ([10](#_ENREF_10), [15](#_ENREF_15)). One of the most devastating CVD complication due to T2D onset is heart failure ([16](#_ENREF_16)). Likewise, cerebrovascular complications (CeVD) are more common in patients with diabetes due to similar mechanisms among others ([17](#_ENREF_17)). Although there has been extensive research in understanding these conditions in diabetic populations independently, little is known about their sequential occurrence and interactions in different populations. Studying the occurrence patterns of these micro and macro-vascular complications may help to improve the understanding and management of T2D progression.

The present study aims to assess typical sequences of specific diabetes complications: CKD, DNeu, DR, CVD, HF, and CeVD in different populations across the world and to understand the changes in these pathways throughout the last 20 years. The study will be embedded in the international network on Observational Health Data Sciences and Informatics (OHDSI) and leverage the Observational Medical Outcomes Partnership (OMOP) common data model. The study design and analysis plan will be reproducible in different data sources as far as they are mapped to the OMOP common data model. In addition, the OHDSI environment and OMOP common data model will allow reproducibility over time, incorporating new data or the expansion of the research scope to other relevant questions such as treatment patterns.

# Research questions and objectives

The aim of this study is to identify common occurrence patterns of specific complications in patients with T2D: CKD, DR, DNeu, HF, CVD and CeVD. These patterns will be assessed by population, age at T2D diagnosis and stratified by calendar year of index event (diagnosis of T2D).

## Primary objective

The primary objective in this study is to characterize the occurrence and its ordered sequence of certain chronic conditions in adult patients with T2D by year, population and age category.

## Secondary objectives

The secondary objectives in this study are to assess, among newly diagnosed T2D patients:

* The average time-to-event since T2D diagnosis for CKD, DR, DNeu, HF, CVD and CeVD
* The incidence rate of CKD, DR, DNeu, HF, and CVD and CeVD.

# Research methods

## Study design

A systematic evaluation of diverse healthcare data sources will be performed, leveraging the OMOP common data model. In this data model, clinical terminology is standardized across multiple data sources. The OHDSI community provides the analytical tools required to conduct this analysis on data converted to the OMOP data model.

The study cohort includes patients with a first diagnosis code for T2D during the study period running between 2001 and 2019. At least one year of database history should be available before the first T2D diagnosis code in the database, to reasonably assume that this was the first diagnosis of that patient, i.e. an incident (new) rather than prevalent (existing) T2D patient. The date of the first T2D diagnosis is considered the index date. Due to the frequent monitoring expected in T2D patient populations, we believe one year will be sufficient to disentangle prevalent and incident T2D populations as excluding patients with pre-existing complications will help to correctly identify T2D onset in these cases. Following the creation of this study cohort we will track the sequence of pre-specified complications occurring during their time in the observation period. The sequences will include the occurrence of any of the listed complications. A graphical depiction of the event flow for a given individual is characterized in Figure1:

**Figure 1: Event Flow**

2001

2019

Index event: 1st T2D diagnosis

First diagnosis of CKD, DR, DNeu, CVD, HF or CeVD (any of these can occur prior to T2D)

Follow-up period

## Setting

This study will be conducted in the OHDSI network of observational healthcare data sources converted to the OMOP common data model. Full details on the OMOP common data model are provided on the OHDSI github site. Data sources converted to OMOP range from EHR, claims, outpatient, registries and inpatient databases. Because all data sources are converted into the same data model, analytical tools that were developed in the OHDSI community can be systematically applied. Internally, there are three OMOP data sources that will be used in the study: IBM MarketScan commercial claims (CCAE) and Medicare (MDCR) from the US and CPRD from the UK. We will also use IQVIA data assets from the US, UK, France, Germany and Belgium to be able to build a more comprehensive picture. When we extend the study to the OHDSI network, we will select diverse data sources that can capture populations not represented in our internal data sources. Full details on the list of available data sources are available on the OHDSI website. Currently more than 100 data assets from 19 countries are converted to OMOP data model according to the OHDSI platform website. Once this study is completed and after proper consultation internally, we will initiate a network study within the OHDSI platform

**Network Study:**

The network study is developed using the following steps:

1. IQVIA will run the study on their internal databases converted into the OMOP common data model to ensure the cohort executes successfully, returning statistical diagnostics and confirming data stability.

2. This study protocol will then be converted into the OHDSI template available here: http://www.ohdsi.org/web/wiki/doku.php?id=research:project\_proposal\_template\_3 which includes information on the objective, rationale, target population, and initial source code. This OHDSI protocol will be used by the participating sites to better understand the study.

3. Once the code, and the OHDSI protocol are ready, and if it is deemed convenient it will be posted to the OHDSI Research Forum: http://forums.ohdsi.org/c/researchers. The proposed project will be reviewed by the other OHDSI contributors to determine interest level, discuss and provide suggestions to improve the study.

4. For the network to be able to participate, they would require the code developed by us. We will

post the code on OHDSI GitHub repository (https://github.com/OHDSI/StudyProtocols).

5. OHDSI community members are invited to run the analysis.

6. Collaborators will often have comments and suggestions about the protocol, or run into issues

when executing the code. They will post on the forums and contact the lead investigators to

further discuss these issues.

7. We will set a study closure date on the website and allow for a few months for all participating

sites to execute the study.

8. The code is then executed at the local database environment and the results (de-identified,

aggregate) are returned for subsequent analysis by IQVIA, resulting in a report or publication.

Further details on the selection of the data sources is provided in section 9.4.

For publication purposes, IQVIA data owner approval will be sought on an individual database basis as each data asset has its own approval process.

* IQVIA UK-IMRD will require SRC approval which requires a ‘blind’ protocol to be submitted as well as an SRC protocol pro forma (to be completed and executed by IQVIA)
* IQVIA France – requires completion of ‘Public Interest Grid’ documentation
* Notification of an ‘intent to publish’ is circulated across remaining IQVIA data owners as no formal approval process is required.

### Study population

The study cohort includes patients with a new diagnosis of T2D during the study period running between 2001 and 2019 and at least one year of database history before the date of this first T2D diagnosis, which is considered the index date. For case ascertainment we will used a previously published algorithm for identification of persons with T2D using EHR databases <https://www.sciencedirect.com/science/article/pii/S1532046414001798>

The concepts to be used in this algorithm are listed in annex 2.

### Study time frame

* Time windows
  + Start date for case ascertainment: Jan 1st, 2000
    - Start date for cohort entry: Jan 1st, 2001
  + End date: Last available date of each data source
* Index date
  + Date of first recorded T2D diagnosis in the data source

### Selection criteria

* Inclusion criteria
  + At least one diagnosis code of T2D after Jan 1st, 2001 (date of the first record is the index date)
  + AND at least one anti-diabetic treatment prescription after Jan 1st, 2001
  + AND At least 18 years of age on the index date
  + AND At least 1 year of database observation before the index date
* Exclusion criteria
  + One T2D diagnosis code any time before the index date
  + OR one T1D diagnostic code any time before the index date
  + OR two T1D diagnostic codes any time after the index date
  + OR one insulin prescription before the index date or in the 30 days after
  + OR one prescription of an antidiabetic drug before the index date (the 30 days preceding index date will be excluded from this to allow for coding practices, since the diagnosis code might be recorded later than the prescription code).

### Representativeness

For the outcome characterization to be generalizable, we chose to systematically conduct our

study across a diverse set of healthcare data sources. The unifying technical component is that all

data sources chosen for the study are in the OMOP common data model, providing a backbone of standardization.

We also conduct the study to exhibit database heterogeneity, population diversity and variance in

care. From this perspective, we can identify apparent differences in the natural history of T2D and provide generalizable patterns for healthcare practice in managing patients with T2D.

We start the analysis using Bayer’s internal OMOP data sources --CCAE, MDCR and CPRD—plus IQVIA’s data assets . This will cover US commercially insured patients, US patients over 65 years old and from lower income strata, primary care records in the UK (IMRD-UK), Germany (DA Germany), France (LPD France) and Belgium (LPD Belgium). Extending the study to the OHDSI network would allow us to diversify our study with populations, data source types and geographic settings beyond the ones already described. Invited data sources would fall into one of the following categories: Asian healthcare data sources, EHR in the US, EHR and registries in Europe and outpatient and ambulatory care data sources. Geographic representation we wish to cover in the network study includes: Korea, EU countries, east coast US, Midwest US and west coast US. The criterion required to select and include the data sources in the study is specified in the section 9.4.

## Variables

### Target cohort definition

* Inclusion criteria
  + At least one diagnosis code of T2D after Jan 1st, 2001 (date of the first record is the index date)
  + AND at least one anti-diabetic treatment prescription after Jan 1st, 2001
  + AND at least 18 years of age on the index date
  + AND at least 1 year of database observation before the index date
* Exclusion criteria
  + One T2D diagnosis code any time before the index date
  + OR one T1D diagnostic code any time before the index date
  + OR two T1D diagnostic codes any time after the index date
  + OR one insulin prescription before the index date or in the 30 days after
  + OR one prescription of an antidiabetic drug before the index date (the 30 days preceding index date will be excluded from this to allow for coding practices, since the diagnosis code might be recorded later than the prescription code).

### Outcome cohorts definition

Details on the concepts used to define the cohorts can be found in annex 2.

* **Chronic kidney disease:** Occurrence of any of the listed conditions after index date
* **Diabetic retinopathy:** Occurrence of any of the listed conditions after index date
* **Diabetic neuropathy:** Occurrence of any of the listed conditions after index date
* **Cardiovascular disease:** Occurrence of any of the listed conditions after index date
  + CHD (excluding HF):
  + PAD:
  + CeVD:
  + Heart failure: we will use the phenotype from OHDSI github Phenotype library[[1]](#footnote-2).  
    <https://github.com/OHDSI/PhenotypeLibrary/blob/master/Heart%20Failure/Heart%20Failure%20(All).txt#L1>

### Covariate definition

The analysis will be stratified by the following covariates:

Age categories at index: less than 50, 50 to 75, and more than 75.

Calendar year of the index diagnosis

Data source

## Data sources

Table 2 provides descriptions for each of the available data sources. Further as specified in section 9.2 the full study protocol could be shared to the extended OHDSI network so other OMOP data partners with interest in this research can replicate the analysis and obtain information.

Table 2: Data Source Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| *Data Source* | *Country* | *Type* | *Description* |
| Clinical Practice Research Datalink (CPRD) | UK | EHR | CPRD is an anonymized longitudinal electronic health records from primary care practices in UK. Patient management system with many aspects of patient care covered, including diagnoses, prescriptions, signs and symptoms, procedures, labs, lifestyle factors, clinical and administrative/social data. As of 1 April 2018, CPRD contained 12.51 million patients with patient-level observations from October 1987 through December 2016. An internal HTML summary report characterizing the data quality of CPRD is available using the OHDSI tool ACHILLES in ATLAS. A screen capture of the report is included in the annex. Access to the interactive report on Bayer’s OHDSI server is available upon request. |
| Truven MarketScan combined Commercial Claims and Encounters (CCAE) and Medicare Supplemental Beneficiaries (MDCR) | USA | Claims | CCAE is an administrative health claims database for active employees, early retirees, COBRA continues, and their dependents insured by employer-sponsored plans (individuals in plans or product lines with fee-for-service plans and fully capitated or partially capitated plans). As of 1 April 2018, CCAE contained 138.51 million patients with patient-level observations from January 2002 through December 2016. An internal HTML summary report characterizing the data quality of CCAE is available using the OHDSI tool ACHILLES in ATLAS. A screen capture of the report is included in the annex. Access to the interactive report on Bayer’s OHDSI server is available upon request. MDCR is an administrative health claims database for Medicare-eligible active and retired employees and their Medicare-eligible dependents from employer-sponsored supplemental plans (predominantly fee-for-service plans). Only plans where both the Medicare-paid amounts and the employer paid amounts were available and evident on the claims were selected for this database. As of 1 April 2018, MDCR contained 9.89 million patients with patient-level observations from January 2002 through December 2016. An internal HTML summary report characterizing the data quality of MDCR is available using the OHDSI tool ACHILLES in ATLAS. A screen capture of the report is included in the annex. Access to the interactive report on Bayer’s OHDSI server is available upon request. |
| OMOP Longitudinal Patient Database (LPD) Belgium | Belgium | EMR | The IQVIA LPD Belgium database consists of data collected from electronic medical records and longitudinal patient database. Data coverage 2 million patients, 688 care sites, 15 million visits, and 140 million service records. Dates of service include 2008 forward. Key attributes include demographics, prescriptions as prescribed at brand level, diagnosis, social and lifestyle factors, lab measurements and quantitative findings from pathology reports. |
| OMOP Disease Analyser (DA) Germany | Germany | EMR | The IQVIA (Formerly QuintilesIMS) Disease Analyzer (DA) Germany database consists of data collected from physician practices and medical centers for all ages. Mostly primary care physician data however some data from specialty practices (where practices are electronically connected to each other) and some lab data is included. Key attributes include demographics, prescriptions, over the counter medicines, vaccines, large molecule biologics, diagnosis, lab measurements, actions (e.g. referrals, sick notes). |
| OMOP Longitudinal Patient Database (LPD) France | France | EMR | The IQVIA OMOP Longitudinal Patient Database (LPD) France database consists of anonymized patient records collected from Patient Management software used by Doctors during an office visit to document patients’ clinical records. The total database consists of 1200 GPs, 7.8 million patients, 620 specialists across 8 specialties (cardiology, neurology, psychiatry, pulmonology, gastroenterology, gynaecology, diabetology & rheumatology). |
| IQVIA Medical Research Data-UK (IMRD-UK) | UK | EMR | The UK IQVIA Medical Research Data (IMRD-UK) is a large database of anonymized electronic medical records collected at Primary Care clinics throughout the UK. Data coverage includes 15 million patients, 5 million providers, 793 care sites and more than 5 billion service records. Dates of service include from 1989 through present. |
| IQVIA Brazil DataSUS (DSUS) LPD | Brazil | Claims | The IQVIA Brazil DataSUS database is a collection of medical claims from the information system of the Brazilian Ministry of Health (MOH), which is the backbone of hospital and high complexity/cost management system of the government. IQVIA developed a set of integration and linking methodologies to put all assets together and create a longitudinal asset combining SIA (ambulatory) and SIH (hospital) data. The data covers between 70 and 75% of the population (approximately 150 million patients) under this MOH hospital setting. Key variables of this database includes demographics, costs, resource utilization, mortality, new born data, oncology, nephrology, hospital facilities, etc. |

## Study size

Patients meeting provisional target cohort definition (patients with T2D):

* CPRD: 331,251

|  |  |
| --- | --- |
| * CCAE: 2,662,448 |  |

* MDCR: 789,307
* US Ambulatory EMR: 5,982,314
* UK IMRD: 504,791
* France LPD: 498,583
* Germany DA: 1,884,668
* Belgium LPD: 55,083

CCAE and MDCR will be evaluated as a single combined database.

## Data management

Prior to this study, the original data sources were converted to the OMOP common data model through a process known as ETL (extraction, transformation, loading). This process defines the rules for how source codes are mapped to standardized concepts in OMOP while maintaining quality of information. The data is refreshed periodically, responding to updates by the data source.

The OMOP process maps source codes to a standardized set of concepts depending on their domain. There are five key standardized domains: condition, drug, measurement procedure and observation. Source codes under the condition and procedure domain map to SNOMED vocabulary. Source codes under the drug domain map to RxNorm vocabulary. Source codes under the measurement domain map to LOINC vocabulary. Source codes under the observation domain will map to either SNOMED, RxNorm or LOINC, depending on the context. Full documentation of the ETL (extraction, transformation, loading) process into the OMOP common data model for CPRD, CCAE, and MDCR (our internal data sources) is provided in the Annex 1: List of stand-alone documents.

Internal OMOP data sources are stored in a database management system, redshift, on a private Bayer server. Access requires connection credentials and is limited to the designated researcher. The OMOP common data model and generated cohorts cannot be overwritten; therefore, analysis may only be conducted in a scratch schema unique to the designated researcher, ensuring that information is not manipulated or erased.

We will not have access to external OMOP data sources participating in the network study. Study participants will be sent a script of parameterized code that will be run in their local OHDSI environment. Only summary statistics and tables (i.e. aggregated results) will be returned.

Data sources participating in our network study will not provide ETL information, however these data sources have been validated to ensure that the OMOP data set matches the quality of information provided in the original source.

## Data analysis

Statistical analyses will be of descriptive nature. No comparative analysis will be performed. All variables will be analyzed descriptively with appropriate statistical methods: categorical variables by frequency tables (absolute and relative frequencies) and continuous variables by sample statistics (i.e. mean, standard deviation, minimum, median, quartiles, 5th and 95th percentiles, and maximum). Continuous variables will be described by absolute value and as change from baseline per analysis time point, if applicable. Selected continuous variables will be categorized in a clinically meaningful way. Rates will be described by absolute value and 95% confidence interval.

Once the cohort of T2D patients is created, we start the analysis by determining the complications sequences. The sequence begins with the initial event, first complication occurrence, and continues counting “first occurrences” to any of the other complications listed in the objectives. Once the complication sequences are established, the number of patients following the same sequence are counted up and tabulated for each data source. Cell counts less than 5 can be suppressed. We can consider temporal, and demographic patterns by stratifying the treatment counts by the index year, age at T2D onset, and database. The tables created in the analysis will be used by the TxPath tool to create sunburst graphs to visualize the sequence of complications. Each data source will output a unique sunburst graph. The main output of the study is a tabulation of sequences; counts and rates of persons with T2D with unique complications’ pathway.

No data imputation strategies will be applied to supplement missing data. However, missing values

may occur in a small proportion. In this case, individuals with missing values will be kept in the

analysis and a separate category will be created for missing values of that variable.

## Quality control

The study will be conducted by a designated researcher who has access to the OHDSI analytical tools in the Bayer network. Before the study is executed with our internal OMOP data sources, the procedure will be reviewed by the study team. All OHDSI analytical tools have been extensively validated and undergo continuous maintenance.

## Limitations of the research methods

Depending on the nature of the source population in the database, our analysis is susceptible to bias such as selection bias. This is because the data sources might not be fully representative for their relative countries. Acknowledging for this limitation, we believe the network study approach, particularly with OHDSI, allows us to put the results of each individual data source in context with one another and increase the generalizability of the findings. Our goal is to establish the prevalence of T2D patients across a diverse series of populations using different data sources. If we focus on a single data source and do not display heterogeneity, we would not be able to determine whether the treatment pathway results are generalizable to other populations. The OHDSI component allows us to evaluate this diverse array of healthcare data sources systematically. It should also be considered that there could be a small possibility that the results could underreport prevalence due to minor missed data mappings during the OMOP standardization process.

By asking for a minimum of 365 days of prior observation in the database before the index date we ensure incident nature of T2D ascertainment and a proper baseline characterization. However, this may yield to misclassification in some databases were encounters between patient and health system might not be frequent. Although this might be especially relevant for younger populations, we expect our base target cohorts to be older and thus less affected by seldom encounters.

## Other aspects

### OHDSI Network Process and Transparency

Extending our study to the OHDSI network requires translation of this protocol in OHDSI template and creation of a study specific R package. The OHDSI protocol is required to ensure study transparency for all community members and that participants have clear guidance on how to reproduce the study in their OMOP environment. A study package is created and disbursed to participating community members to run on their OMOP data. External collaborators will only be able to change the parameter settings to input their private dbms connection details and determine small cell count suppression. Study sites will only return summary results and tables generated from the study package. No patient level data is exchanged. Analytical code and the study protocol are open source and publicly available. Extending the study to the OHDSI community allows us to generate results from data sources that would not otherwise be available in a different setting.

# Protection of human subjects

This study will be conducted in accordance with good pharmacoepidemiology practice. In this investigation we will use a medical record linkage database where the information of patients is anonymized and there is no need to obtain informed consent from patients. We will comply with all applicable data protection, security and privacy laws, rules and regulations with respect to the collection, production, use, processing, storage, transfer, modification, deletion, and/or disclosure of any information related to this study under this Agreement.

Bayer will ensure that information is not disclosed or transferred to any third party not mentioned in this protocol. Bayer will ensure that appropriate technical and organizational measures are taken to protect information against accidental or unlawful destruction or accidental loss or alteration, or unauthorized disclosure or access and against all other unlawful forms of processing. The database used to perform this study is maintained at the premises of Bayer AG. Privacy issues will be addressed and respected at each stage of the study. All analyses and reporting will be done on appropriately de-identified data and only in aggregate form. We will abide by the Guidelines for good pharmacoepidemiology practice.

# Management and reporting of adverse events/adverse reactions

This is a non-interventional study based on secondary use of data and is not a PASS, so no individual reporting of adverse reactions will be included in the study as there is no plan to obtain information on drug use of any kind. However, as European data is included in the study, the management and reporting of adverse events will be according to the European Medicines Agency (EMA) Guideline on Good Pharmacovigilance Practices (GVP) (Module VI–Management and reporting of adverse reactions to medicinal products), for non-interventional study designs that are based on secondary use of data. As per the EMA Guideline on Good Pharmacovigilance Practices (Module VI–Management and reporting of adverse reactions to medicinal products [Revision 1]), individual reporting of adverse reactions is not required for non-interventional study designs that are based on secondary use of data.

# Plans for disseminating and communicating study results

The results of this observational study are intended to be published in a peer-reviewed journal and as abstracts/presentations at medical congresses under the oversight of the market authorization holder (MAH). Current guidelines and recommendation on good publication practice will be followed (e.g. Good Publication Practice Guidelines 2, STrengthening the Reporting of OBservational studies in Epidemiology (STROBE)).

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# Annex 1: List of stand-alone documents

Table 2: List of stand-alone documents

|  |  |
| --- | --- |
| **Document Name** | **Final version and date (if available)\*** |
| <XXX> | N/A |
| <Country & Site list> | N/A |
| <Steering/Adjudication/Publication Committee Members> | N/A |
| <Steering/Adjudication/Publication Committee Charter> | N/A |
| <CRF> | N/A |
| <Detailed list of variables> | N/A |
| <EDC System> | N/A |
| <EDC System Validation> | N/A |
| <DMP> | N/A |
| <SAP> | N/A |
| *<Name/Reference>* | N/A |

\* Draft versions are indicated by <draft> in brackets and date. “tbd” indicates documents that are not available at the time of protocol creation, but will be issued at a later stage

# Annex 2: Additional information

Concepts used for concept sets and cohort definitions:

**Table A1. Concepts related to type 2 diabetes.**

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 201826 | 44054006 | [Type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/201826) | yes |
| 4130162 | 237599002 | [Insulin treated type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4130162) | yes |
| 4221487 | 420715001 | |  | | --- | | [Persistent microalbuminuria associated with type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4221487) | | yes |
| 443732 | 422014003 | |  | | --- | | [Disorder due to type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443732) | | yes |
| 4223739 | 421986006 | |  | | --- | | [Persistent proteinuria associated with type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4223739) | | yes |
| 4193704 | 313436004 | |  | | --- | | [Type 2 diabetes mellitus without complication](https://ohdsi.bayer.cnb/atlas/#/concept/4193704) | | yes |
| 443733 | 422099009 | |  | | --- | | [Disorder of eye with type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443733) | | yes |
| 443731 | 420279001 | [Renal disorder due to type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443731) | yes |
| 4226121 | 422034002 | |  | | --- | | [Retinopathy with type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4226121) | | yes |
| 443734 | 421750000 | |  | | --- | | [Ketoacidosis in type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443734) | | yes |
| 37016354 | 368581000119106 | [Neuropathy due to type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/37016354) | yes |
| 443733 | 422099009 | |  | | --- | | [Disorder of eye with type 2 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443733) | | yes |

Table A2. Concepts related to type 1 diabetes.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 201254 | 46635009 | [Type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/201254) | Yes |
| 435216 | 420868002 | [Disorder due to type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/435216) | Yes |
| 36715571 | 721283000 | [Acidosis due to type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/36715571) | Yes |
| 37016348 | 367991000119101 | [Hyperglycemia due to type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/37016348) | Yes |
| 439770 | 420270002 | [Ketoacidosis in type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/439770) | Yes |
| 200687 | 421893009 | [Renal disorder associated with type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/200687) | Yes |
| 443412 | 313435000 | [Type 1 diabetes mellitus without complication](https://ohdsi.bayer.cnb/atlas/#/concept/443412) | Yes |
| 40484648 | 444073006 | |  | | --- | | [Type 1 diabetes mellitus uncontrolled](https://ohdsi.bayer.cnb/atlas/#/concept/40484648) | | Yes |
| 42538169 | 739681000 | |  | | --- | | [Disorder of eye with type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/42538169) | | Yes |
| 4222553 | 420514000 | [Persistent proteinuria associated with type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4222553) | Yes |
| 4227210 | 420789003 | [Retinopathy with type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4227210) | Yes |
| 4295011 | 401110002 | [Type 1 diabetes mellitus with persistent microalbuminuria](https://ohdsi.bayer.cnb/atlas/#/concept/4295011) | Yes |
| 377821 | 421468001 | |  | | --- | | [Neurological disorder with type 1 diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/377821) | | Yes |

Table A3. Concepts related to unspecified diabetes.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 201820 | 73211009 | [Diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/201820) | Yes |
| 443767 | 25093002 | |  |  | | --- | --- | |  | [Eye disorder due to diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443767) | | Yes |
| 4174977 | 4855003 | [Retinopathy due to diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4174977) | Yes |
| 4236285 | 407569005 | [Patient on maximal tolerated therapy for diabetes](https://ohdsi.bayer.cnb/atlas/#/concept/4236285) | Yes |
| 443730 | 422088007 | [Nervous system disorder due to diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/443730) | Yes |
| 4334884 | 232020009 | [Maculopathy with diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4334884) | Yes |
| 192279 | 127013003 | [Kidney disorder due to diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/192279) |  |

Table A4. Concepts related to diabetes that must be excluded from case ascertainment.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 4060085 | 161641009 | [At risk of diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4060085) | Yes |
| 4058243 | 199223000 | [Diabetes mellitus during pregnancy, childbirth and the puerperium](https://ohdsi.bayer.cnb/atlas/#/concept/4058243) |  |
| 4024659 | 11687002 | |  |  | | --- | --- | |  | [Gestational diabetes mellitus](https://ohdsi.bayer.cnb/atlas/#/concept/4024659) | |  |

Table A5. Concepts related to Chronic Kidney disease.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 46271022 | 709044004 | [Chronic kidney disease](https://ohdsi.bayer.cnb/atlas/#/concept/46271022) | Yes |
| 443614 | 431855005 | [Chronic kidney disease stage 1](https://ohdsi.bayer.cnb/atlas/#/concept/443614) | Yes |
| 443601 | 431856006 | [Chronic kidney disease stage 2](https://ohdsi.bayer.cnb/atlas/#/concept/443601) | Yes |
| 443597 | 433144002 | [Chronic kidney disease stage 3](https://ohdsi.bayer.cnb/atlas/#/concept/443597) | Yes |
| 45763854 | 700378005 | [Chronic kidney disease stage 3A](https://ohdsi.bayer.cnb/atlas/#/concept/45763854) | Yes |
| 45763855 | 700379002 | [Chronic kidney disease stage 3B](https://ohdsi.bayer.cnb/atlas/#/concept/45763855) | Yes |
| 443612 | 431857002 | [Chronic kidney disease stage 4](https://ohdsi.bayer.cnb/atlas/#/concept/443612) | Yes |
| 443611 | 433146000 | [Chronic kidney disease stage 5](https://ohdsi.bayer.cnb/atlas/#/concept/443611) | Yes |

Table A6. Concepts related to Chronic Kidney disease.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 46271022 | 709044004 | [Chronic kidney disease](https://ohdsi.bayer.cnb/atlas/#/concept/46271022) | Yes |
| 443614 | 431855005 | [Chronic kidney disease stage 1](https://ohdsi.bayer.cnb/atlas/#/concept/443614) | Yes |
| 443601 | 431856006 | [Chronic kidney disease stage 2](https://ohdsi.bayer.cnb/atlas/#/concept/443601) | Yes |
| 443597 | 433144002 | [Chronic kidney disease stage 3](https://ohdsi.bayer.cnb/atlas/#/concept/443597) | Yes |
| 45763854 | 700378005 | [Chronic kidney disease stage 3A](https://ohdsi.bayer.cnb/atlas/#/concept/45763854) | Yes |
| 45763855 | 700379002 | [Chronic kidney disease stage 3B](https://ohdsi.bayer.cnb/atlas/#/concept/45763855) | Yes |
| 443612 | 431857002 | [Chronic kidney disease stage 4](https://ohdsi.bayer.cnb/atlas/#/concept/443612) | Yes |
| 443611 | 433146000 | [Chronic kidney disease stage 5](https://ohdsi.bayer.cnb/atlas/#/concept/443611) | Yes |

Table A7. Concepts related to Diabetic retinopathy.

| Concept ID | Concept code | Concept description | Descendants |
| --- | --- | --- | --- |
| 4196110 | 312947009 | Acute central serous chorioretinopathy | Yes |
| 4195495 | 314006008 | Acute central serous retinopathy with subretinal fluid | Yes |
| 4105173 | 193350004 | Advanced maculopathy with diabetes mellitus | Yes |
| 4209538 | 311782002 | Advanced retinal disease with diabetes mellitus | Yes |
| 372894 | 312956001 | Central serous chorioretinopathy | Yes |
| 36712990 | 1,59976E+16 | Central serous choroidopathy of bilateral eyes | Yes |
| 36712991 | 1,59977E+16 | Central serous choroidopathy of left eye | Yes |
| 36712989 | 1,59976E+16 | Central serous choroidopathy of right eye | Yes |
| 4195496 | 314009001 | Central serous retinopathy with small retinal pigment epithelial detachment | Yes |
| 4208201 | 312923002 | Chronic central serous chorioretinopathy | Yes |
| 4199038 | 314007004 | Chronic central serous retinopathy with diffuse retinal pigment epithelial detachment | Yes |
| 35626072 | 769222008 | Clinically significant macular edema of left eye due to diabetes mellitus | Yes |
| 35626071 | 769221001 | Clinically significant macular edema of right eye due to diabetes mellitus | Yes |
| 35626764 | 770097006 | Clinically significant macular edema with diabetes mellitus | Yes |
| 4164175 | 399868002 | Diabetic intraretinal microvascular anomaly | Yes |
| 380097 | 312912001 | Diabetic macular edema | Yes |
| 35626068 | 769218003 | Diabetic macular edema of left eye | Yes |
| 35626067 | 769217008 | Diabetic macular edema of right eye | Yes |
| 4101478 | 25412000 | Diabetic retinal microaneurysm | Yes |
| 4161670 | 399866003 | Diabetic retinal venous beading | Yes |
| 44805628 | 7,75841E+14 | Diabetic retinopathy detected by national screening programme | Yes |
| 4338901 | 232023006 | Diabetic traction retinal detachment | Yes |
| 4199039 | 314010006 | Diffuse exudative maculopathy with diabetes mellitus | Yes |
| 36684780 | 3,45771E+14 | Disorder of bilateral retinas co-occurrent and due to hypertension | Yes |
| 36684718 | 3,40441E+14 | Disorder of left retina co-occurrent and due to hypertension | Yes |
| 36684653 | 3,34831E+14 | Disorder of right retina co-occurrent and due to hypertension | Yes |
| 4221344 | 420486006 | Exudative maculopathy with type 1 diabetes mellitus | Yes |
| 4223463 | 421779007 | Exudative maculopathy with type 2 diabetes mellitus | Yes |
| 4210872 | 314011005 | Focal exudative diabetic maculopathy | Yes |
| 4164176 | 399869005 | High risk proliferative diabetic retinopathy not amenable to photocoagulation | Yes |
| 376965 | 6962006 | Hypertensive retinopathy | Yes |
| 4195051 | 312924008 | Inactive central serous chorioretinopathy | Yes |
| 4210871 | 314008009 | Inactive central serous retinopathy with focal retinal pigment epithelial detachment | Yes |
| 4210874 | 314014002 | Ischemic maculopathy with diabetes mellitus | Yes |
| 45770830 | 9,7331E+13 | Macular edema and retinopathy due to type 2 diabetes mellitus | Yes |
| 35626069 | 769219006 | Macular edema due to type 1 diabetes mellitus | Yes |
| 35626070 | 769220000 | Macular edema due to type 2 diabetes mellitus | Yes |
| 4162095 | 399864000 | Macular edema not clinically significant with diabetes mellitus | Yes |
| 35626088 | 769245002 | Maculopathy of left eye with diabetes mellitus | Yes |
| 35626087 | 769244003 | Maculopathy of right eye with diabetes mellitus | Yes |
| 4334884 | 232020009 | Maculopathy with diabetes mellitus | Yes |
| 378743 | 312903003 | Mild nonproliferative diabetic retinopathy | Yes |
| 35626039 | 769184004 | Mild nonproliferative diabetic retinopathy of left eye | Yes |
| 35626038 | 769183005 | Mild nonproliferative diabetic retinopathy of right eye | Yes |
| 37016356 | 3,68711E+14 | Mild nonproliferative retinopathy due to secondary diabetes mellitus | Yes |
| 37016179 | 1,38881E+14 | Mild nonproliferative retinopathy due to type 1 diabetes mellitus | Yes |
| 45757435 | 1,38911E+14 | Mild nonproliferative retinopathy due to type 2 diabetes mellitus | Yes |
| 4195498 | 314015001 | Mixed maculopathy with diabetes mellitus | Yes |
| 377552 | 312904009 | Moderate nonproliferative diabetic retinopathy | Yes |
| 35626042 | 769186002 | Moderate nonproliferative diabetic retinopathy of left eye | Yes |
| 35626041 | 769185003 | Moderate nonproliferative diabetic retinopathy of right eye | Yes |
| 37016358 | 3,68741E+14 | Moderate nonproliferative retinopathy due to secondary diabetes mellitus | Yes |
| 37016180 | 1,38891E+14 | Moderate nonproliferative retinopathy due to type 1 diabetes mellitus | Yes |
| 45770881 | 1,38921E+14 | Moderate nonproliferative retinopathy due to type 2 diabetes mellitus | Yes |
| 36713328 | 6,77741E+14 | Non-diabetic proliferative retinopathy of bilateral eyes | Yes |
| 4269870 | 399875001 | Non-high-risk proliferative diabetic retinopathy with clinically significant macular edema | Yes |
| 4161671 | 399870006 | Non-high-risk proliferative diabetic retinopathy with no macular edema | Yes |
| 37016357 | 3,68721E+14 | Non-proliferative retinopathy due to secondary diabetes mellitus | Yes |
| 374338 | 46674002 | Nondiabetic proliferative retinopathy | Yes |
| 376683 | 390834004 | Nonproliferative diabetic retinopathy | Yes |
| 45763583 | 6,0961E+13 | Nonproliferative diabetic retinopathy due to type 1 diabetes mellitus | Yes |
| 43530656 | 1,551E+12 | Nonproliferative diabetic retinopathy due to type 2 diabetes mellitus | Yes |
| 4235260 | 408410002 | O/E - left eye background diabetic retinopathy | Yes |
| 4255400 | 408412005 | O/E - left eye preproliferative diabetic retinopathy | Yes |
| 4252356 | 408414006 | O/E - left eye proliferative diabetic retinopathy | Yes |
| 4215961 | 414894003 | O/E - left eye stable treated proliferative diabetic retinopathy | Yes |
| 4215961 | 414894003 | O/E - left eye stable treated proliferative diabetic retinopathy | Yes |
| 4252215 | 408313004 | O/E - non-referable retinopathy | Yes |
| 4246964 | 408312009 | O/E - referable retinopathy | Yes |
| 4255281 | 408311002 | O/E - retinopathy | Yes |
| 4247107 | 408409007 | O/E - right eye background diabetic retinopathy | Yes |
| 4255399 | 408411003 | O/E - right eye preproliferative diabetic retinopathy | Yes |
| 4255401 | 408413000 | O/E - right eye proliferative diabetic retinopathy | Yes |
| 4212441 | 414910007 | O/E - right eye stable treated proliferative diabetic retinopathy | Yes |
| 4218499 | 417677008 | O/E - sight threatening diabetic retinopathy | Yes |
| 4105172 | 193349004 | Preproliferative diabetic retinopathy | Yes |
| 35626037 | 769182000 | Preproliferative diabetic retinopathy of left eye | Yes |
| 35626036 | 769181007 | Preproliferative diabetic retinopathy of right eye | Yes |
| 4195043 | 312907002 | Proliferative diabetic retinopathy - high risk | Yes |
| 4266042 | 399874002 | Proliferative diabetic retinopathy - high risk with clinically significant macular edema | Yes |
| 4164174 | 399862001 | Proliferative diabetic retinopathy - high risk with no macular edema | Yes |
| 4195044 | 312909004 | Proliferative diabetic retinopathy - iris neovascularization | Yes |
| 4210128 | 312906006 | Proliferative diabetic retinopathy - non high risk | Yes |
| 4210129 | 312908007 | Proliferative diabetic retinopathy - quiescent | Yes |
| 43530685 | 1,501E+12 | Proliferative diabetic retinopathy due to type 2 diabetes mellitus | Yes |
| 45757065 | 1,03981E+14 | Proliferative diabetic retinopathy following surgery | Yes |
| 4336000 | 232022001 | Proliferative diabetic retinopathy with new vessels elsewhere than on disc | Yes |
| 4338900 | 232021008 | Proliferative diabetic retinopathy with new vessels on disc | Yes |
| 45757798 | 4,30801E+14 | Proliferative retinopathy | Yes |
| 4109401 | 193370005 | Proliferative retinopathy due to sickle cell disease | Yes |
| 45763584 | 6,0971E+13 | Proliferative retinopathy due to type 1 diabetes mellitus | Yes |
| 36674200 | 770766000 | Proliferative retinopathy of left eye co-occurrent and due to diabetes mellitus | Yes |
| 36674199 | 770765001 | Proliferative retinopathy of right eye co-occurrent and due to diabetes mellitus | Yes |
| 380096 | 59276001 | Proliferative retinopathy with diabetes mellitus | Yes |
| 45770831 | 9,7341E+13 | Proliferative retinopathy with retinal edema due to type 2 diabetes mellitus | Yes |
| 35626904 | 770323005 | Retinal edema with diabetes mellitus | Yes |
| 45757266 | 1,09171E+14 | Retinal edema with type 1 diabetes mellitus | Yes |
| 45770928 | 2,8331E+13 | Retinal edema with type 2 diabetes mellitus | Yes |
| 35626905 | 770324004 | Retinal ischemia with diabetes mellitus | Yes |
| 45757073 | 1,04941E+14 | Retinal ischemia with type 1 diabetes mellitus | Yes |
| 45757075 | 1,04961E+14 | Retinal ischemia with type 2 diabetes mellitus | Yes |
| 36674753 | 770582001 | Retinal microaneurysm of left eye co-occurrent and due to diabetes mellitus | Yes |
| 36674752 | 770581008 | Retinal microaneurysm of right eye co-occurrent and due to diabetes mellitus | Yes |
| 36674766 | 770600002 | Retinal venous beading of left eye co-occurrent and due to diabetes mellitus | Yes |
| 36674765 | 770599000 | Retinal venous beading of right eye co-occurrent and due to diabetes mellitus | Yes |
| 4174977 | 4855003 | Retinopathy due to diabetes mellitus | Yes |
| 4227210 | 420789003 | Retinopathy with type 1 diabetes mellitus | Yes |
| 4226121 | 422034002 | Retinopathy with type 2 diabetes mellitus | Yes |
| 376114 | 312905005 | Severe nonproliferative diabetic retinopathy | Yes |
| 35626044 | 769188001 | Severe nonproliferative diabetic retinopathy of left eye | Yes |
| 35626043 | 769187006 | Severe nonproliferative diabetic retinopathy of right eye | Yes |
| 4290822 | 399872003 | Severe nonproliferative diabetic retinopathy with clinically significant macular edema | Yes |
| 4266637 | 399873008 | Severe nonproliferative diabetic retinopathy with no macular edema | Yes |
| 765373 | 1,38901E+14 | Severe nonproliferative retinopathy due to diabetes mellitus type 1 | Yes |
| 761053 | 1,38941E+14 | Severe nonproliferative retinopathy due to diabetes mellitus type 2 | Yes |
| 45769873 | 8,2571E+13 | Traction retinal detachment with type 1 diabetes mellitus | Yes |
| 45773064 | 8,2541E+13 | Traction retinal detachment with type 2 diabetes mellitus | Yes |
| 4210137 | 312957005 | Variant central serous chorioretinopathy | Yes |
| 4269871 | 399876000 | Very severe nonproliferative diabetic retinopathy | Yes |
| 35626047 | 769191001 | Very severe nonproliferative diabetic retinopathy of left eye | Yes |
| 35626046 | 769190000 | Very severe nonproliferative diabetic retinopathy of right eye | Yes |
| 4290823 | 399877009 | Very severe nonproliferative diabetic retinopathy with clinically significant macular edema | Yes |
| 4221962 | 399863006 | Very severe nonproliferative diabetic retinopathy with no macular edema | Yes |
| 4164632 | 399865004 | Very severe proliferative diabetic retinopathy | Yes |
| 4266041 | 399871005 | Visually threatening diabetic retinopathy | Yes |

Table A8. Concepts related to diabetic neuropathy.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 4105016 | 193183000 | Acute painful diabetic neuropathy | Yes |
| 4194970 | 79554005 | Asymmetric proximal motor neuropathy with diabetes mellitus | Yes |
| 4101892 | 193185007 | Asymptomatic neuropathy with diabetes mellitus | Yes |
| 42537705 | 737240009 | Autonomic neuropathy due to endocrine disease | Yes |
| 37016768 | 712883005 | Autonomic neuropathy with type 2 diabetes mellitus | Yes |
| 35626761 | 770094004 | Cervical radiculoplexus neuropathy co-occurrent and due to diabetes mellitus | Yes |
| 4105639 | 193184006 | Chronic painful diabetic neuropathy | Yes |
| 35626762 | 770095003 | Cranial nerve palsy with diabetes mellitus | Yes |
| 45769894 | 8,7921E+13 | Cranial nerve palsy with type 2 diabetes mellitus | Yes |
| 4046332 | 230574001 | Diabetic acute painful polyneuropathy | Yes |
| 4044393 | 230576004 | Diabetic asymmetric polyneuropathy | Yes |
| 4175440 | 50620007 | Diabetic autonomic neuropathy | Yes |
| 4044392 | 230575000 | Diabetic chronic painful polyneuropathy | Yes |
| 4191611 | 39058009 | Diabetic lumbosacral radiculoplexus neuropathy | Yes |
| 4054812 | 126534007 | Diabetic mixed sensory-motor polyneuropathy | Yes |
| 4048028 | 230577008 | Diabetic mononeuropathy | Yes |
| 4262282 | 35777006 | Diabetic mononeuropathy multiplex | Yes |
| 4129225 | 126535008 | Diabetic motor polyneuropathy | Yes |
| 4044391 | 230572002 | Diabetic neuropathy | Yes |
| 4234742 | 359611005 | Diabetic neuropathy with neurologic complication | Yes |
| 4311708 | 424736006 | Diabetic peripheral neuropathy | Yes |
| 376112 | 49455004 | Diabetic polyneuropathy | Yes |
| 4023792 | 19378003 | Diabetic pseudotabes | Yes |
| 4131117 | 127011001 | Diabetic sensory polyneuropathy | Yes |
| 4048029 | 230579006 | Diabetic thoracic radiculoplexus neuropathy | Yes |
| 4242528 | 38205001 | Diarrhea with diabetes mellitus | Yes |
| 4263090 | 361216007 | Femoral mononeuropathy with diabetes mellitus | Yes |
| 37017430 | 713704004 | Gastroparesis with diabetes mellitus | Yes |
| 37018728 | 713703005 | Gastroparesis with type 2 diabetes mellitus | Yes |
| 4140466 | 427027005 | Lumbosacral radiculoplexus neuropathy with type 2 diabetes mellitus | Yes |
| 4101887 | 193141005 | Mononeuritis multiplex with diabetes mellitus | Yes |
| 4304701 | 81830002 | Mononeuropathy simplex with diabetes mellitus | Yes |
| 4222415 | 420436000 | Mononeuropathy with type 2 diabetes mellitus | Yes |
| 4147504 | 267604001 | Myasthenic syndrome due to diabetic amyotrophy | Yes |
| 4101898 | 193212008 | Myasthenic syndrome due to hypothyroidism | Yes |
| 4102498 | 193214009 | Myasthenic syndrome due to thyrotoxicosis | Yes |
| 4044394 | 230580009 | Myxedema neuropathy | Yes |
| 4048027 | 230571009 | Neuropathy associated with endocrine disorder | Yes |
| 4101895 | 193191009 | Neuropathy associated with hypoglycemia | Yes |
| 37016354 | 3,68581E+14 | Neuropathy due to type 2 diabetes mellitus | Yes |
| 4046335 | 230581008 | Neuropathy in acromegaly | Yes |
| 4176925 | 427943001 | Ophthalmoplegia with diabetes mellitus | Yes |
| 43530689 | 1,511E+12 | Peripheral neuropathy with type 2 diabetes | Yes |
| 45757278 | 1,10181E+14 | Peripheral sensory neuropathy due to type 2 diabetes mellitus | Yes |
| 760979 | 1,26571E+14 | Polyneuropathy due to secondary diabetes mellitus | Yes |
| 37017432 | 713706002 | Polyneuropathy due to type 2 diabetes mellitus | Yes |
| 4189418 | 39181008 | Radiculoplexus neuropathy with diabetes mellitus | Yes |
| 4307319 | 39127005 | Symmetric proximal motor neuropathy with diabetes mellitus | Yes |
| 44805212 | 7,73001E+14 | Symptomatic diabetic peripheral neuropathy | Yes |

Table A9. Concepts related to CHD (excluding HF).

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 4109485 | 253716004 | Aberrant course of left anterior descending coronary artery from right coronary artery crossing right ventricular outflow tract | Yes |
| 4113301 | 253714001 | Abnormal coronary artery course | Yes |
| 4119951 | 233844002 | Accelerated coronary artery disease in transplanted heart | Yes |
| 4215140 | 394659003 | Acute coronary syndrome | Yes |
| 36712983 | 1,59601E+16 | Angina co-occurrent and due to coronary arteriosclerosis | Yes |
| 4152843 | 270510008 | Anomalous communication of coronary artery | Yes |
| 43021615 | 461420008 | Anomalous coronary artery with acute angulation of less than 45 degrees relative to aorta | Yes |
| 43022037 | 461421007 | Anomalous coronary artery without acute angulation of less than 45 degrees relative to aorta | Yes |
| 43021581 | 461384000 | Anomalous course of coronary artery across right ventricular outflow tract | Yes |
| 43021475 | 461111008 | Anomalous course of coronary artery anterior to aorta | Yes |
| 43021476 | 461112001 | Anomalous course of coronary artery anterior to pulmonary trunk | Yes |
| 43022026 | 461109004 | Anomalous course of coronary artery anterior to pulmonary trunk and aorta | Yes |
| 43021311 | 460585008 | Anomalous course of coronary artery posterior to aorta | Yes |
| 43021310 | 460584007 | Anomalous course of coronary artery posterior to pulmonary trunk | Yes |
| 43021474 | 461110009 | Anomalous course of coronary artery posterior to pulmonary trunk and aorta | Yes |
| 43021582 | 461385004 | Anomalous course of coronary artery through infundibular septum | Yes |
| 43021580 | 461383006 | Anomalous intramural course of proximal portion of coronary artery above aortic sinus | Yes |
| 43021579 | 461382001 | Anomalous intramural course of proximal portion of coronary artery across commissure of aortic valve | Yes |
| 43021578 | 461381008 | Anomalous intramural course of proximal portion of coronary artery within aortic sinus | Yes |
| 43021307 | 460581004 | Anomalous origin of accessory coronary artery from aortic sinus | Yes |
| 43021937 | 459066006 | Anomalous origin of accessory coronary artery from pulmonary artery | Yes |
| 43020572 | 471289009 | Anomalous origin of circumflex artery from aortic sinus to right of nonfacing aortic sinus and anomalous origin of left anterior descending coronary artery and right coronary artery from aortic sinus to left of nonfacing aortic sinus | Yes |
| 43021294 | 460471001 | Anomalous origin of conus artery from separate aortic sinus orifice | Yes |
| 43021301 | 460510005 | Anomalous origin of coronary arteries from anterior aortic sinus | Yes |
| 43021302 | 460517008 | Anomalous origin of coronary arteries from both aortic sinuses of bicuspid valve | Yes |
| 4328721 | 75398000 | Anomalous origin of coronary artery | Yes |
| 43022025 | 461105005 | Anomalous origin of coronary artery from aorta | Yes |
| 43020569 | 471285003 | Anomalous origin of coronary artery from aortic sinus to left of nonfacing aortic sinus | Yes |
| 43021886 | 471286002 | Anomalous origin of coronary artery from aortic sinus to right of nonfacing aortic sinus | Yes |
| 4113298 | 253708008 | Anomalous origin of coronary artery from left pulmonary artery | Yes |
| 4109483 | 253703004 | Anomalous origin of coronary artery from non-facing sinus | Yes |
| 4113297 | 253706007 | Anomalous origin of coronary artery from pulmonary arterial tree | Yes |
| 4109644 | 253707003 | Anomalous origin of coronary artery from right pulmonary artery | Yes |
| 43021628 | 461436005 | Anomalous origin of dual left anterior descending coronary arteries | Yes |
| 43021193 | 460437005 | Anomalous origin of dual left anterior descending coronary arteries from right coronary artery and left coronary artery | Yes |
| 43021973 | 460438000 | Anomalous origin of large conus artery from right coronary artery | Yes |
| 43020576 | 471293003 | Anomalous origin of left anterior descending artery and right coronary artery from aortic sinus to right of nonfacing aortic sinus and anomalous origin of circumflex artery from aortic sinus to left of nonfacing aortic sinus | Yes |
| 43020573 | 471290000 | Anomalous origin of left anterior descending artery from aortic sinus to right of nonfacing aortic sinus and anomalous origin of circumflex artery and right coronary artery from aortic sinus to left of nonfacing aortic sinus | Yes |
| 42873052 | 450302005 | Anomalous origin of left anterior descending coronary artery from pulmonary artery | Yes |
| 43021627 | 461435009 | Anomalous origin of left anterior descending coronary artery from right coronary artery aortic sinus | Yes |
| 4109484 | 253704005 | Anomalous origin of left anterior descending from right coronary artery | Yes |
| 4206334 | 55546004 | Anomalous origin of left circumflex artery from right coronary artery | Yes |
| 43020689 | 458039003 | Anomalous origin of left circumflex coronary artery from pulmonary artery | Yes |
| 43021314 | 460588005 | Anomalous origin of left circumflex coronary artery from right coronary aortic sinus | Yes |
| 43021796 | 473444001 | Anomalous origin of left coronary artery | Yes |
| 43021308 | 460582006 | Anomalous origin of left coronary artery and right coronary artery from pulmonary artery | Yes |
| 43020570 | 471287006 | Anomalous origin of left coronary artery and right coronary artery with dual orifices from aortic sinus to left of nonfacing aortic sinus | Yes |
| 43020571 | 471288001 | Anomalous origin of left coronary artery and right coronary artery with dual orifices from aortic sinus to right of nonfacing aortic sinus | Yes |
| 42873051 | 450301003 | Anomalous origin of left coronary artery from pulmonary artery | Yes |
| 43021435 | 460930004 | Anomalous origin of left coronary artery from right coronary aortic sinus | Yes |
| 43021305 | 460538002 | Anomalous origin of left coronary artery from right coronary artery | Yes |
| 43021795 | 473443007 | Anomalous origin of right coronary artery | Yes |
| 43020575 | 471292008 | Anomalous origin of right coronary artery and circumflex artery from aortic sinus to right of nonfacing aortic sinus and anomalous origin of left anterior descending artery from aortic sinus to left on nonfacing aortic sinus | Yes |
| 43020574 | 471291001 | Anomalous origin of right coronary artery from aortic sinus to right of nonfacing aortic sinus and anomalous origin of left coronary artery from aortic sinus to left of nonfacing aortic sinus | Yes |
| 43021303 | 460524009 | Anomalous origin of right coronary artery from left anterior descending coronary artery | Yes |
| 43021304 | 460531008 | Anomalous origin of right coronary artery from left circumflex coronary artery | Yes |
| 43021312 | 460586009 | Anomalous origin of right coronary artery from left coronary artery | Yes |
| 43021434 | 460923005 | Anomalous origin of right coronary artery from left coronary artery aortic sinus | Yes |
| 43021437 | 460944005 | Anomalous origin of right coronary artery from left coronary artery aortic sinus and anomalous origin of left coronary artery from right coronary artery aortic sinus | Yes |
| 42873050 | 450300002 | Anomalous origin of right coronary artery from pulmonary artery | Yes |
| 43020579 | 471298007 | Anomalous origin of single coronary artery from aortic sinus to left of nonfacing aortic sinus | Yes |
| 43020580 | 471299004 | Anomalous origin of single coronary artery from aortic sinus to right of nonfacing aortic sinus | Yes |
| 43021313 | 460587000 | Anomalous origin of single coronary artery from left coronary artery aortic sinus | Yes |
| 43021888 | 471297002 | Anomalous origin of single coronary artery from nonfacing aortic sinus | Yes |
| 43021436 | 460937001 | Anomalous origin of single coronary artery from right coronary artery aortic sinus | Yes |
| 43021309 | 460583001 | Anomalous origin of sinus node coronary artery from separate aortic sinus orifice | Yes |
| 36683267 | 780842009 | Aortopulmonary coronary arterial course | Yes |
| 4199962 | 315348000 | Asymptomatic coronary heart disease | Yes |
| 764123 | 4,51041E+14 | Atherosclerosis of coronary artery without angina pectoris | Yes |
| 313217 | 49436004 | Atrial fibrillation | Yes |
| 4108832 | 195080001 | Atrial fibrillation and flutter | Yes |
| 44782442 | 1,20041E+14 | Atrial fibrillation with rapid ventricular response | Yes |
| 4109649 | 253730009 | Balanced coronary system | Yes |
| 4242670 | 92517006 | Calcific coronary arteriosclerosis | Yes |
| 4141360 | 426749004 | Chronic atrial fibrillation | Yes |
| 4109486 | 253719006 | Circumflex runs posterior to aorta | Yes |
| 4109647 | 253718003 | Circumflex runs posterior to pulmonary trunk | Yes |
| 43021574 | 461359003 | Common coronary artery orifice | Yes |
| 4178750 | 5230009 | Congenital absence of coronary artery | Yes |
| 321109 | 28574005 | Congenital anomaly of coronary artery | Yes |
| 43020880 | 459065005 | Congenital atresia of left main stem coronary artery | Yes |
| 43021306 | 460545002 | Congenital atresia of right coronary artery orifice | Yes |
| 4069185 | 204378009 | Congenital coronary aneurysm | Yes |
| 4109487 | 253720000 | Congenital coronary arteriovenous fistula | Yes |
| 4108876 | 253725005 | Congenital coronary artery calcification | Yes |
| 4016142 | 11433004 | Congenital coronary artery fistula | Yes |
| 4029827 | 128555001 | Congenital coronary artery fistula to left atrium | Yes |
| 4027245 | 128556000 | Congenital coronary artery fistula to left ventricle | Yes |
| 4030427 | 129582000 | Congenital coronary artery fistula to pulmonary artery | Yes |
| 4029361 | 128557009 | Congenital coronary artery fistula to right atrium | Yes |
| 4029362 | 128558004 | Congenital coronary artery fistula to right ventricle | Yes |
| 4178321 | 42866003 | Congenital coronary artery sclerosis | Yes |
| 4069186 | 204379001 | Congenital stenosis of coronary artery | Yes |
| 4117112 | 300996004 | Controlled atrial fibrillation | Yes |
| 317576 | 53741008 | Coronary arteriosclerosis | Yes |
| 46269996 | 1,10187E+16 | Coronary arteriosclerosis after percutaneous coronary angioplasty | Yes |
| 4175846 | 427919004 | Coronary arteriosclerosis due to radiation | Yes |
| 37016181 | 1,39011E+14 | Coronary arteriosclerosis following coronary artery bypass graft | Yes |
| 42872402 | 1,641E+12 | Coronary arteriosclerosis in native artery | Yes |
| 4253217 | 74218008 | Coronary artery arising from main pulmonary artery | Yes |
| 4252385 | 408546009 | Coronary artery bypass graft occlusion | Yes |
| 43021572 | 461345005 | Coronary artery orifice abnormally low | Yes |
| 4108874 | 253717008 | Coronary artery runs between aorta and pulmonary trunk | Yes |
| 4225958 | 421327009 | Coronary artery stent thrombosis | Yes |
| 4134723 | 398274000 | Coronary artery thrombosis | Yes |
| 40481919 | 443502000 | Coronary atherosclerosis | Yes |
| 44806109 | 8,10681E+14 | Coronary microvascular disease | Yes |
| 4113299 | 253710005 | Coronary orifice abnormally high | Yes |
| 4113300 | 253711009 | Coronary orifice asymmetrical | Yes |
| 4109646 | 253713007 | Coronary orifice atresia | Yes |
| 4108215 | 194821006 | Coronary thrombosis not resulting in myocardial infarction | Yes |
| 43021630 | 461438006 | Double barrel dual coronary artery orifices within aortic sinus | Yes |
| 4108673 | 194843003 | Double coronary vessel disease | Yes |
| 4108872 | 253712002 | Dual coronary orifice | Yes |
| 37395821 | 715395008 | Familial atrial fibrillation | Yes |
| 43021470 | 461104009 | Interruption of coronary artery | Yes |
| 4108873 | 253715000 | Intramural coronary artery course | Yes |
| 4153091 | 28248000 | Left anterior descending coronary artery thrombosis | Yes |
| 4109491 | 253729004 | Left dominant coronary system | Yes |
| 4155962 | 371804009 | Left main coronary artery disease | Yes |
| 4209308 | 56276002 | Left main coronary artery thrombosis | Yes |
| 40491973 | 448824007 | Left ventricular myocardial sinusoids | Yes |
| 764149 | 4,51361E+14 | Lipid-rich atherosclerosis of coronary artery | Yes |
| 4119601 | 233910005 | Lone atrial fibrillation | Yes |
| 45768480 | 706923002 | Longstanding persistent atrial fibrillation | Yes |
| 43021570 | 461331004 | Malposition of coronary artery orifice | Yes |
| 4155007 | 371803003 | Multi vessel coronary artery disease | Yes |
| 36714444 | 719678003 | Non-obstructive atherosclerosis of coronary artery | Yes |
| 4119602 | 233911009 | Non-rheumatic atrial fibrillation | Yes |
| 4168972 | 420006002 | Obliterative coronary artery disease | Yes |
| 4154290 | 282825002 | Paroxysmal atrial fibrillation | Yes |
| 4232691 | 440028005 | Permanent atrial fibrillation | Yes |
| 4232697 | 440059007 | Persistent atrial fibrillation | Yes |
| 4199501 | 314208002 | Rapid atrial fibrillation | Yes |
| 4178622 | 429245005 | Recurrent coronary arteriosclerosis after percutaneous transluminal coronary angioplasty | Yes |
| 4113303 | 253728007 | Right dominant coronary system | Yes |
| 4304192 | 10365005 | Right main coronary artery thrombosis | Yes |
| 4161455 | 371805005 | Significant coronary bypass graft disease | Yes |
| 4329430 | 21981000 | Single coronary artery | Yes |
| 43021472 | 461107002 | Single coronary artery dividing into right coronary artery and left coronary artery | Yes |
| 4111393 | 194842008 | Single coronary vessel disease | Yes |
| 43020561 | 471276003 | Single left coronary artery supplying all of heart with usual distribution of right coronary artery derived from distal left coronary artery | Yes |
| 43021885 | 471277007 | Single right coronary artery supplying all of heart with usual distribution of left coronary artery derived from distal right coronary artery | Yes |
| 43021432 | 460913001 | Systemic to coronary collateral artery | Yes |
| 40489974 | 448478000 | Systemic to pulmonary collateral artery from coronary artery | Yes |
| 761921 | 1,983E+16 | Thrombosis of left circumflex artery | Yes |
| 4124682 | 233817007 | Triple vessel disease of the heart | Yes |
| 36712982 | 1,59601E+16 | Unstable angina co-occurrent and due to coronary arteriosclerosis | Yes |
| 4109642 | 253700001 | Variant coronary origin from aortic sinus | Yes |
| 43021631 | 461439003 | Widely spaced right coronary artery and left coronary artery orifices within single aortic sinus | Yes |

Table A9. Concepts related to PAD.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 43021868 | 2,97E+13 | Aneurysm of peripheral artery | Yes |
| 317309 | 4E+08 | Peripheral arterial occlusive disease | Yes |
| 4111847 | 1,95E+08 | Peripheral artery spasm | Yes |
| 4124836 | 2,34E+08 | Peripheral ischemia | Yes |
| 321052 | 4E+08 | Peripheral vascular disease | Yes |
| 321822 | 4,22E+08 | Peripheral vascular disorder due to diabetes mellitus | Yes |
| 321596 | 20696009 | Peripheral venous insufficiency | Yes |

Table A10. Concepts related to CeVD.

|  |  |  |  |
| --- | --- | --- | --- |
| Concept ID | Concept code | Concept description | Descendants |
| 43531619 | 1,26E+14 | Acquired caroticocavernous sinus fistula | Yes |
| 42535107 | 1,6E+16 | Acquired left carotid cavernous fistula | Yes |
| 42535106 | 1,6E+16 | Acquired right carotid cavernous fistula | Yes |
| 42535227 | 1,62E+16 | Acute cerebral ischemia | Yes |
| 4164092 | 29322000 | Acute cerebrovascular insufficiency | Yes |
| 374060 | 2,89E+08 | Acute ill-defined cerebrovascular disease | Yes |
| 36684840 | 4,58E+14 | Acute stroke | Yes |
| 4338523 | 88032003 | Amaurosis fugax | Yes |
| 36712812 | 1,22E+16 | Amaurosis fugax of left eye | Yes |
| 36712813 | 1,22E+16 | Amaurosis fugax of right eye | Yes |
| 4031930 | 10878002 | Aneurysm of common carotid artery | Yes |
| 43020490 | 2,85E+14 | Aneurysm of extracranial portion of internal carotid artery | Yes |
| 35615015 | 1,56E+16 | Aneurysm of extracranial portion of left internal carotid artery | Yes |
| 35615014 | 1,56E+16 | Aneurysm of extracranial portion of right internal carotid artery | Yes |
| 4078016 | 24624008 | Aneurysm of internal carotid artery | Yes |
| 43020491 | 2,85E+14 | Aneurysm of intracranial portion of internal carotid artery | Yes |
| 36712951 | 1,56E+16 | Aneurysm of intracranial portion of left internal carotid artery | Yes |
| 36712950 | 1,56E+16 | Aneurysm of intracranial portion of right internal carotid artery | Yes |
| 35615017 | 1,56E+16 | Aneurysm of left common carotid artery | Yes |
| 36712953 | 1,56E+16 | Aneurysm of left internal carotid artery | Yes |
| 35615016 | 1,56E+16 | Aneurysm of right common carotid artery | Yes |
| 36712952 | 1,56E+16 | Aneurysm of right internal carotid artery | Yes |
| 4099850 | 2,53E+08 | Aneurysm of the vein of Galen | Yes |
| 762627 | 4,3E+14 | Anterior cerebral artery embolism | Yes |
| 4108360 | 1,95E+08 | Anterior cerebral artery syndrome | Yes |
| 765664 | 4,37E+14 | Anterior choroidal artery occlusion with infarction | Yes |
| 4031045 | 14309005 | Anterior choroidal artery syndrome | Yes |
| 43531717 | 7,93E+12 | Anterior choroidal artery thrombosis | Yes |
| 4045747 | 2,31E+08 | Anterior circulation stroke of uncertain pathology | Yes |
| 762630 | 4,3E+14 | Anterior inferior cerebellar artery embolism | Yes |
| 763094 | 4,36E+14 | Anterior inferior cerebellar artery occlusion with infarction | Yes |
| 4007949 | 1,11E+08 | Arteriopathic granular atrophy of cerebral cortex | Yes |
| 43021427 | 4,61E+08 | Arteriovenous fistula of great cerebral vein of Galen | Yes |
| 761930 | 2,1E+10 | Asymptomatic carotid artery stenosis | Yes |
| 4046444 | 2,31E+08 | Asymptomatic cerebrovascular disease | Yes |
| 45766110 | 7,03E+08 | Asymptomatic occlusion of anterior cerebral artery | Yes |
| 45766088 | 7,03E+08 | Asymptomatic occlusion of extracranial carotid artery | Yes |
| 45771319 | 7,03E+08 | Asymptomatic occlusion of intracranial carotid artery | Yes |
| 45766111 | 7,03E+08 | Asymptomatic occlusion of middle cerebral artery | Yes |
| 45766108 | 7,03E+08 | Asymptomatic occlusion of posterior cerebral artery | Yes |
| 37110240 | 7,24E+08 | Asymptomatic stenosis of extracranial artery | Yes |
| 37119077 | 7,24E+08 | Asymptomatic stenosis of intracranial artery | Yes |
| 42535411 | 2,91E+14 | Ataxia as sequela of cerebrovascular accident | Yes |
| 42535703 | 6,9E+14 | Ataxia as sequela of embolic cerebrovascular accident | Yes |
| 42535685 | 6,74E+14 | Ataxia as sequela of hemorrhagic cerebrovascular accident | Yes |
| 4009154 | 1,11E+08 | Atheroma of cerebral arteries | Yes |
| 36675148 | 7,71E+08 | Autosomal recessive leukoencephalopathy; ischaemic stroke; retinitis pigmentosa syndrome | Yes |
| 761798 | 1,6E+16 | Basilar artery embolism with stroke | Yes |
| 374055 | 64009001 | Basilar artery syndrome | Yes |
| 4175205 | 2,77E+08 | Berry aneurysm | Yes |
| 4145355 | 4,27E+08 | Bilateral carotid artery occlusion | Yes |
| 762149 | 2,94E+14 | Bilateral carotid artery stenosis | Yes |
| 37108912 | 1,57E+16 | Bilateral vertebral artery dissection | Yes |
| 42535098 | 1,6E+16 | Bilateral vertebral artery occlusion | Yes |
| 4319330 | 95456009 | Brain stem ischemia | Yes |
| 4111710 | 1,95E+08 | Brainstem stroke syndrome | Yes |
| 4116060 | 2,55E+08 | Bregeat's syndrome | Yes |
| 36680604 | 7,78E+08 | COL4A1-related retinal arteriolar tortuosity; infantile hemiparesis; autosomal dominant leukoencephalopathy syndrome | Yes |
| 37396293 | 7,16E+08 | CVA (cerebrovascular accident) during surgery | Yes |
| 4045734 | 2,31E+08 | CVA - cerebrovascular accident due to cerebral artery occlusion | Yes |
| 4211509 | 4,14E+08 | Cardioembolic stroke | Yes |
| 313226 | 2,66E+08 | Carotid artery occlusion | Yes |
| 762700 | 4,31E+14 | Carotid artery occlusion without infarction | Yes |
| 442615 | 64586002 | Carotid artery stenosis | Yes |
| 763093 | 4,36E+14 | Carotid artery stenosis without infarction | Yes |
| 4112020 | 1,95E+08 | Carotid artery syndrome hemispheric | Yes |
| 4201411 | 3,02E+08 | Carotid cavernous fistula | Yes |
| 4043734 | 2,31E+08 | Carotid territory transient ischemic attack | Yes |
| 4146840 | 35386004 | Cavernous sinus syndrome | Yes |
| 762629 | 4,3E+14 | Cerebellar artery embolism | Yes |
| 4317291 | 95458005 | Cerebellar artery occlusion | Yes |
| 4317292 | 95459002 | Cerebellar artery thrombosis | Yes |
| 36716999 | 1,64E+16 | Cerebellar stroke | Yes |
| 4111711 | 1,95E+08 | Cerebellar stroke syndrome | Yes |
| 4045749 | 2,31E+08 | Cerebral amyloid angiopathy | Yes |
| 45766201 | 7,03E+08 | Cerebral amyloid angiopathy associated with systemic amyloidosis | Yes |
| 4029497 | 1,29E+08 | Cerebral arterial aneurysm | Yes |
| 4278243 | 65312002 | Cerebral arteriosclerosis | Yes |
| 4121803 | 2,34E+08 | Cerebral arteriovenous malformation | Yes |
| 380747 | 28366008 | Cerebral arteritis | Yes |
| 45766199 | 7,03E+08 | Cerebral arteritis due to infectious disease | Yes |
| 4045751 | 2,31E+08 | Cerebral arteritis in giant cell arteritis | Yes |
| 4048789 | 2,31E+08 | Cerebral arteritis in systemic vasculitis | Yes |
| 372924 | 20059004 | Cerebral artery occlusion | Yes |
| 316437 | 55382008 | Cerebral atherosclerosis | Yes |
| 4190891 | 3,91E+08 | Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 45766122 | 7,03E+08 | Cerebral autosomal recessive arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 375557 | 75543006 | Cerebral embolism | Yes |
| 43531607 | 9,95E+13 | Cerebral infarction due to stenosis of carotid artery | Yes |
| 374384 | 2,88E+08 | Cerebral ischemia | Yes |
| 37110239 | 7,24E+08 | Cerebral ischemic stroke due to extracranial large artery atherosclerosis | Yes |
| 37110238 | 7,24E+08 | Cerebral ischemic stroke due to intracranial large artery atherosclerosis | Yes |
| 37110678 | 7,25E+08 | Cerebral ischemic stroke due to occlusion of extracranial large artery | Yes |
| 37110237 | 7,24E+08 | Cerebral ischemic stroke due to small artery occlusion | Yes |
| 37110679 | 7,25E+08 | Cerebral ischemic stroke due to stenosis of extracranial large artery | Yes |
| 441874 | 71444005 | Cerebral thrombosis | Yes |
| 4140462 | 4,27E+08 | Cerebral vasculitis | Yes |
| 45766121 | 7,03E+08 | Cerebral vasoconstriction syndrome | Yes |
| 4269085 | 62702001 | Cerebral vein occlusion | Yes |
| 4102202 | 1,93E+08 | Cerebral venous sinus thrombosis | Yes |
| 4062269 | 2E+08 | Cerebral venous thrombosis in pregnancy | Yes |
| 4066234 | 2E+08 | Cerebral venous thrombosis in the puerperium | Yes |
| 4046443 | 2,31E+08 | Cerebral venous thrombosis of cortical vein | Yes |
| 762938 | 4,34E+14 | Cerebral venous thrombosis of cortical vein with infarction | Yes |
| 762811 | 4,32E+14 | Cerebral venous thrombosis of cortical vein without infarction | Yes |
| 4048787 | 2,31E+08 | Cerebral venous thrombosis of great cerebral vein | Yes |
| 4223544 | 84216001 | Cerebral venous thrombosis of pregnancy AND/OR puerperium | Yes |
| 4048786 | 2,31E+08 | Cerebral venous thrombosis of sigmoid sinus | Yes |
| 4043735 | 2,31E+08 | Cerebral venous thrombosis of straight sinus | Yes |
| 45766160 | 7,03E+08 | Cerebrofacial arteriovenous metameric syndrome | Yes |
| 45766161 | 7,03E+08 | Cerebrofacial arteriovenous metameric syndrome type 1 | Yes |
| 4284132 | 6729006 | Cerebrofacial arteriovenous metameric syndrome type 2 | Yes |
| 45766162 | 7,03E+08 | Cerebrofacial arteriovenous metameric syndrome type 3 | Yes |
| 36715304 | 7,21E+08 | Cerebroretinal vasculopathy | Yes |
| 4219904 | 8269002 | Cerebrospinal angiopathy | Yes |
| 381316 | 2,31E+08 | Cerebrovascular accident | Yes |
| 37395576 | 1,6E+16 | Cerebrovascular accident due to left carotid artery stenosis | Yes |
| 761785 | 1,6E+16 | Cerebrovascular accident due to occlusion of left anterior cerebral artery | Yes |
| 42539262 | 1,6E+16 | Cerebrovascular accident due to occlusion of left carotid artery | Yes |
| 42535148 | 1,6E+16 | Cerebrovascular accident due to occlusion of left cerebellar artery | Yes |
| 42535508 | 3,29E+14 | Cerebrovascular accident due to occlusion of left cerebellar artery by embolus | Yes |
| 42535112 | 1,6E+16 | Cerebrovascular accident due to occlusion of left middle cerebral artery | Yes |
| 42535504 | 3,29E+14 | Cerebrovascular accident due to occlusion of left middle cerebral artery by embolus | Yes |
| 42535146 | 1,6E+16 | Cerebrovascular accident due to occlusion of left pontine artery | Yes |
| 42539195 | 1,6E+16 | Cerebrovascular accident due to occlusion of left posterior cerebral artery | Yes |
| 42535506 | 3,29E+14 | Cerebrovascular accident due to occlusion of left posterior cerebral artery by embolus | Yes |
| 761835 | 1,6E+16 | Cerebrovascular accident due to occlusion of left posterior communicating artery | Yes |
| 42535461 | 2,93E+14 | Cerebrovascular accident due to occlusion of left vertebral artery | Yes |
| 765281 | 1,6E+16 | Cerebrovascular accident due to occlusion of right anterior cerebral artery | Yes |
| 42535149 | 1,6E+16 | Cerebrovascular accident due to occlusion of right cerebellar artery | Yes |
| 42535507 | 3,29E+14 | Cerebrovascular accident due to occlusion of right cerebellar artery by embolus | Yes |
| 42535111 | 1,6E+16 | Cerebrovascular accident due to occlusion of right middle cerebral artery | Yes |
| 42535503 | 3,29E+14 | Cerebrovascular accident due to occlusion of right middle cerebral artery by embolus | Yes |
| 42535147 | 1,6E+16 | Cerebrovascular accident due to occlusion of right pontine artery | Yes |
| 42535110 | 1,6E+16 | Cerebrovascular accident due to occlusion of right posterior cerebral artery | Yes |
| 42535505 | 3,29E+14 | Cerebrovascular accident due to occlusion of right posterior cerebral artery by embolus | Yes |
| 761836 | 1,6E+16 | Cerebrovascular accident due to occlusion of right posterior communicating artery | Yes |
| 37395574 | 1,6E+16 | Cerebrovascular accident due to right carotid artery occlusion | Yes |
| 37395575 | 1,6E+16 | Cerebrovascular accident due to right carotid artery stenosis | Yes |
| 42535460 | 2,93E+14 | Cerebrovascular accident due to right vertebral artery occlusion | Yes |
| 42535459 | 2,93E+14 | Cerebrovascular accident due to stenosis of left vertebral artery | Yes |
| 42535458 | 2,93E+14 | Cerebrovascular accident due to stenosis of right vertebral artery | Yes |
| 42535511 | 3,3E+14 | Cerebrovascular accident due to thrombus of basilar artery | Yes |
| 42539166 | 3,31E+14 | Cerebrovascular accident due to thrombus of left carotid artery | Yes |
| 42535114 | 1,6E+16 | Cerebrovascular accident due to thrombus of left middle cerebral artery | Yes |
| 42535512 | 3,3E+14 | Cerebrovascular accident due to thrombus of right carotid artery | Yes |
| 761789 | 1,6E+16 | Cerebrovascular accident due to thrombus of right cerebellar artery | Yes |
| 42535113 | 1,6E+16 | Cerebrovascular accident due to thrombus of right middle cerebral artery | Yes |
| 761792 | 1,6E+16 | Cerebrovascular accident due to thrombus of right posterior cerebral artery | Yes |
| 762344 | 3,3E+14 | Cerebrovascular accident due to thrombus of right vertebral artery | Yes |
| 764721 | 5,57E+12 | Cerebrovascular accident with intracranial hemorrhage | Yes |
| 4163543 | 45502001 | Cerebrovascular amyloidosis | Yes |
| 381591 | 62914000 | Cerebrovascular disease | Yes |
| 43021930 | 4,73E+08 | Cerebrovascular disorder due to paradoxical embolus | Yes |
| 316494 | 6594005 | Cerebrovascular disorder in the puerperium | Yes |
| 4002302 | 2,04E+08 | Cerebrovascular system anomalies | Yes |
| 4006976 | 1,11E+08 | Chronic cerebral ischemia | Yes |
| 765568 | 4,34E+14 | Chronic cerebrovascular accident | Yes |
| 4337830 | 87555007 | Claude's syndrome | Yes |
| 4099974 | 25133001 | Completed stroke | Yes |
| 4243358 | 590005 | Congenital aneurysm of anterior communicating artery | Yes |
| 4183995 | 54265003 | Congenital anomaly of cerebral artery | Yes |
| 372721 | 65587001 | Congenital anomaly of cerebrovascular system | Yes |
| 45771351 | 9,36E+14 | Congenital anomaly of precerebral vessel | Yes |
| 4119782 | 2,34E+08 | Congenital arteriovenous fistula of brain | Yes |
| 4091512 | 2495006 | Congenital cerebral arteriovenous aneurysm | Yes |
| 45773171 | 7,03E+08 | Congenital intracranial vascular malformation | Yes |
| 45766098 | 7,03E+08 | Congenital malformation of dural sinus | Yes |
| 4246955 | 93396008 | Congenital stenosis of carotid artery | Yes |
| 4002631 | 2,05E+08 | Congenital stricture of cerebral artery | Yes |
| 4121341 | 3,03E+08 | Diffuse cerebrovascular disease | Yes |
| 4027540 | 1,28E+08 | Disorder of intracranial venous sinus | Yes |
| 762585 | 4,29E+14 | Dissecting aneurysm of anterior cerebral artery | Yes |
| 765899 | 4,29E+14 | Dissecting aneurysm of cerebral artery | Yes |
| 762583 | 4,29E+14 | Dissecting aneurysm of middle cerebral artery | Yes |
| 762584 | 4,29E+14 | Dissecting aneurysm of posterior cerebral artery | Yes |
| 37016924 | 7,13E+08 | Dissection of cerebral artery | Yes |
| 432346 | 2,31E+08 | Dissection of vertebral artery | Yes |
| 4153352 | 3,71E+08 | Embolic stroke | Yes |
| 4104692 | 1,93E+08 | Embolism cavernous sinus | Yes |
| 4100117 | 1,93E+08 | Embolism lateral sinus | Yes |
| 4039439 | 16418006 | Embolism of basilar sinus | Yes |
| 4029415 | 23819000 | Embolism of cavernous venous sinus | Yes |
| 4209442 | 56384000 | Embolism of inferior sagittal sinus | Yes |
| 45766070 | 7,03E+08 | Embolism of internal auditory artery | Yes |
| 4031342 | 14246007 | Embolism of intracranial venous sinus | Yes |
| 4216353 | 80758005 | Embolism of lateral venous sinus | Yes |
| 44782551 | 7E+08 | Embolism of middle cerebral artery | Yes |
| 4222582 | 40276003 | Embolism of precerebral artery | Yes |
| 4224614 | 40450001 | Embolism of superior sagittal sinus | Yes |
| 4134421 | 12853006 | Embolism of torcular Herophili | Yes |
| 4104693 | 1,93E+08 | Embolism superior longitudinal sinus | Yes |
| 4100118 | 1,93E+08 | Embolism transverse sinus | Yes |
| 4182186 | 2,97E+08 | Embolus of circle of Willis | Yes |
| 42536240 | 7,35E+08 | Embolus of left cerebellar artery | Yes |
| 42539472 | 7,35E+08 | Embolus of left middle cerebral artery | Yes |
| 42536242 | 7,35E+08 | Embolus of left posterior cerebral artery | Yes |
| 42536241 | 7,35E+08 | Embolus of right cerebellar artery | Yes |
| 42536243 | 7,35E+08 | Embolus of right middle cerebral artery | Yes |
| 42539014 | 7,35E+08 | Embolus of right posterior cerebral artery | Yes |
| 4185701 | 55734000 | Endophlebitis of basilar sinus | Yes |
| 4250507 | 73390009 | Endophlebitis of cavernous venous sinus | Yes |
| 4267862 | 61687004 | Endophlebitis of inferior sagittal sinus | Yes |
| 4338502 | 87937009 | Endophlebitis of intracranial venous sinus | Yes |
| 4052462 | 16061002 | Endophlebitis of lateral venous sinus | Yes |
| 4327350 | 75138007 | Endophlebitis of superior sagittal sinus | Yes |
| 4217146 | 80901002 | Endophlebitis of torcular Herophili | Yes |
| 4090122 | 2,81E+08 | Extension of cerebrovascular accident | Yes |
| 4006783 | 1,11E+08 | Fahr's syndrome | Yes |
| 45766128 | 7,03E+08 | Familial cerebral saccular aneurysm | Yes |
| 4078314 | 2,76E+08 | Foville syndrome | Yes |
| 4145413 | 3,08E+08 | H/O: Stroke in last year | Yes |
| 35609033 | 1,08E+15 | Haemorrhagic stroke | Yes |
| 441246 | 93468003 | Hemangioma of intracranial structure | Yes |
| 4208824 | 56453003 | Hereditary cerebral amyloid angiopathy; Dutch type | Yes |
| 4164289 | 45639009 | Hereditary cerebral amyloid angiopathy; Icelandic type | Yes |
| 37119072 | 7,24E+08 | Hereditary cerebral hemorrhage with amyloidosis | Yes |
| 4029597 | 2,38E+08 | Hereditary cerebrovascular amyloidosis | Yes |
| 45766123 | 7,03E+08 | Hereditary cystatin C amyloid angiopathy | Yes |
| 4179392 | 4,29E+08 | History of cardioembolic stroke | Yes |
| 46270602 | 6,9E+14 | History of cerebellar stroke | Yes |
| 4077982 | 2,76E+08 | History of cerebrovascular accident | Yes |
| 764952 | 9,09E+13 | History of cerebrovascular accident greater than eight weeks in the past | Yes |
| 44783354 | 6,99E+08 | History of cerebrovascular accident in last eight weeks | Yes |
| 4208306 | 4,4E+08 | History of cerebrovascular accident with residual deficit | Yes |
| 4331077 | 4,3E+08 | History of cerebrovascular accident without residual deficits | Yes |
| 43530672 | 1,42E+14 | History of embolic stroke with deficits | Yes |
| 43530627 | 1,19E+14 | History of embolic stroke without deficits | Yes |
| 765814 | 4,32E+14 | History of embolic stroke without residual deficits | Yes |
| 42535013 | 1,42E+14 | History of hemorrhagic cerebrovascular accident with residual deficit | Yes |
| 36712799 | 1,19E+14 | History of hemorrhagic cerebrovascular accident without residual deficits | Yes |
| 43530667 | 1,41E+14 | History of hemorrhagic stroke with hemiparesis | Yes |
| 43530668 | 1,41E+14 | History of hemorrhagic stroke with hemiplegia | Yes |
| 762807 | 4,32E+14 | History of hemorrhagic stroke with residual hemiparesis | Yes |
| 765815 | 4,32E+14 | History of hemorrhagic stroke with residual hemiplegia | Yes |
| 37016190 | 1,42E+14 | History of ischemic cerebrovascular accident with residual deficit | Yes |
| 37108825 | 1,41E+14 | History of ischemic stroke without residual deficits | Yes |
| 43531606 | 9,91E+13 | History of lacunar cerebrovascular accident | Yes |
| 37016638 | 6,9E+14 | History of nontraumatic ruptured cerebral aneurysm | Yes |
| 43531603 | 9,75E+13 | History of parietal cerebrovascular accident | Yes |
| 43531615 | 1,19E+14 | History of thrombotic stroke without residual deficits | Yes |
| 4108359 | 1,95E+08 | Impending cerebral ischemia | Yes |
| 4116269 | 2,87E+08 | Impending cerebrovascular accident | Yes |
| 4131383 | 4,13E+08 | Infarction of basal ganglia | Yes |
| 36717463 | 7,21E+08 | Injury of intracranial vessel of head | Yes |
| 4096625 | 2,63E+08 | Injury of vertebral artery | Yes |
| 4112021 | 1,95E+08 | Intermittent cerebral ischemia | Yes |
| 4121624 | 2,34E+08 | Internal carotid artery stenosis | Yes |
| 765606 | 4,35E+14 | Internal carotid artery stenosis with infarction | Yes |
| 4029966 | 1,29E+08 | Intracranial aneurysm | Yes |
| 4041678 | 2,3E+08 | Intracranial arterial septic embolism | Yes |
| 4043900 | 2,3E+08 | Intracranial septic embolism | Yes |
| 4120316 | 3,03E+08 | Intracranial septic thrombophlebitis | Yes |
| 4025201 | 1,06E+08 | Intracranial sinus thrombosis; embolism AND/OR inflammation | Yes |
| 4194609 | 3,13E+08 | Intracranial thrombophlebitis | Yes |
| 4139561 | 3,07E+08 | Intracranial venous septic embolism | Yes |
| 4179912 | 2,97E+08 | Intracranial venous thrombosis | Yes |
| 4310996 | 4,23E+08 | Ischemic stroke | Yes |
| 43530669 | 1,41E+14 | Ischemic stroke with coma | Yes |
| 43530670 | 1,41E+14 | Ischemic stroke without coma | Yes |
| 37110765 | 7,25E+08 | Ischemic stroke without residual deficits | Yes |
| 4219010 | 39925003 | Juvenile myopathy; encephalopathy; lactic acidosis AND stroke | Yes |
| 762340 | 3,29E+14 | Left anterior cerebral artery embolism with stroke | Yes |
| 761797 | 1,6E+16 | Left carotid artery embolism with stroke | Yes |
| 43020496 | 2,85E+14 | Left carotid artery occlusion | Yes |
| 43020498 | 2,85E+14 | Left carotid artery stenosis | Yes |
| 761791 | 1,6E+16 | Left cerebellar artery thrombosis with stroke | Yes |
| 761793 | 1,6E+16 | Left posterior cerebral artery thrombosis with stroke | Yes |
| 4112022 | 1,95E+08 | Left sided cerebral hemisphere cerebrovascular accident | Yes |
| 37108913 | 1,57E+16 | Left vertebral artery dissection | Yes |
| 761795 | 1,6E+16 | Left vertebral artery embolism with stroke | Yes |
| 762345 | 3,3E+14 | Left vertebral artery thrombosis with stroke | Yes |
| 4088222 | 1,86E+08 | Listerial cerebral arteritis | Yes |
| 36716114 | 7,22E+08 | Lymphedema and cerebral arteriovenous anomaly syndrome | Yes |
| 36717575 | 7,23E+08 | Major laceration of vertebral artery | Yes |
| 763014 | 4,35E+14 | Middle cerebral artery occlusion | Yes |
| 4110194 | 1,95E+08 | Middle cerebral artery syndrome | Yes |
| 4147995 | 30400005 | Middle meningeal hemorrhage following injury | Yes |
| 4077819 | 2,76E+08 | Millard-Gubler syndrome | Yes |
| 36715676 | 7,21E+08 | Minor laceration of vertebral artery | Yes |
| 43021816 | 7,93E+13 | Mixed dementia | Yes |
| 37110064 | 7,24E+08 | Moyamoya angiopathy; short stature; facial dysmorphism; hypergonadotropic hypogonadism syndrome | Yes |
| 378774 | 69116000 | Moyamoya disease | Yes |
| 36713633 | 7,19E+08 | Moyamoya disease with early onset achalasia | Yes |
| 379778 | 56267009 | Multi-infarct dementia | Yes |
| 37395562 | 1,06E+14 | Multi-infarct dementia due to atherosclerosis | Yes |
| 444091 | 10349009 | Multi-infarct dementia with delirium | Yes |
| 443790 | 25772007 | Multi-infarct dementia with delusions | Yes |
| 443864 | 14070001 | Multi-infarct dementia with depression | Yes |
| 377254 | 70936005 | Multi-infarct dementia; uncomplicated | Yes |
| 4045742 | 2,31E+08 | Multi-infarct state | Yes |
| 4242222 | 37943007 | Multiple AND bilateral precerebral artery embolism | Yes |
| 381036 | 73192008 | Multiple AND bilateral precerebral artery stenosis | Yes |
| 762708 | 4,31E+14 | Multiple AND bilateral precerebral artery stenosis with infarction | Yes |
| 765775 | 4,31E+14 | Multiple AND bilateral precerebral artery stenosis without infarction | Yes |
| 4032493 | 14977000 | Multiple AND bilateral precerebral artery thrombosis | Yes |
| 4078316 | 2,76E+08 | Multiple unruptured cerebral aneurysms | Yes |
| 4049043 | 2,07E+08 | Neonatal cerebral ischemia | Yes |
| 45765438 | 7,02E+08 | Neonatal noninfectious cerebral venous sinus thrombosis | Yes |
| 4159152 | 3,71E+08 | Neonatal stroke | Yes |
| 36717594 | 7,23E+08 | Neonatal thrombosis of cerebral venous sinus | Yes |
| 4111713 | 1,95E+08 | Non-pyogenic venous sinus thrombosis | Yes |
| 42535518 | 3,3E+14 | Non-ruptured acquired cerebral aneurysm | Yes |
| 762096 | 2,91E+14 | Non-traumatic hemorrhage of subarachnoid space from right middle cerebral artery | Yes |
| 761061 | 1,4E+14 | Nonatherosclerotic cerbrovascular accident | Yes |
| 4006295 | 1,11E+08 | Nonparalytic stroke | Yes |
| 761790 | 1,6E+16 | Nonpyogenic cerebral venous thrombosis with stroke | Yes |
| 314667 | 42970005 | Nonpyogenic thrombosis of intracranial venous sinus | Yes |
| 377001 | 42994005 | Nonruptured cerebral aneurysm | Yes |
| 37016925 | 7,13E+08 | Nonruptured cerebral aneurysm due to dissection of cerebral artery | Yes |
| 42535517 | 3,3E+14 | Nonruptured congenital cerebral aneurysm | Yes |
| 37017075 | 7,13E+08 | Nontraumatic ruptured cerebral aneurysm | Yes |
| 4061473 | 2E+08 | Obstetric cerebral venous thrombosis | Yes |
| 4111716 | 1,95E+08 | Occlusion and stenosis of anterior cerebral artery | Yes |
| 765774 | 4,31E+14 | Occlusion and stenosis of anterior cerebral artery without infarction | Yes |
| 4112024 | 1,95E+08 | Occlusion and stenosis of cerebellar arteries | Yes |
| 4111715 | 1,95E+08 | Occlusion and stenosis of cerebral arteries; not resulting in cerebral infarction | Yes |
| 4112023 | 1,95E+08 | Occlusion and stenosis of middle cerebral artery | Yes |
| 765907 | 4,34E+14 | Occlusion and stenosis of middle cerebral artery with infarction | Yes |
| 765495 | 4,31E+14 | Occlusion and stenosis of middle cerebral artery without infarction | Yes |
| 4110197 | 1,95E+08 | Occlusion and stenosis of multiple and bilateral cerebral arteries | Yes |
| 4111717 | 1,95E+08 | Occlusion and stenosis of posterior cerebral artery | Yes |
| 762936 | 4,34E+14 | Occlusion and stenosis of posterior cerebral artery with infarction | Yes |
| 762707 | 4,31E+14 | Occlusion and stenosis of posterior cerebral artery without infarction | Yes |
| 764445 | 4,55E+14 | Occlusion of anterior cerebral artery | Yes |
| 762343 | 3,3E+14 | Occlusion of bilateral posterior cerebral arteries | Yes |
| 43531605 | 9,9E+12 | Occlusion of cerebral artery with stroke | Yes |
| 764503 | 4,56E+14 | Occlusion of cerebral vein by nonpyogenic thrombus | Yes |
| 45766073 | 7,03E+08 | Occlusion of internal auditory artery | Yes |
| 762342 | 3,3E+14 | Occlusion of left anterior cerebral artery | Yes |
| 42536349 | 7,35E+08 | Occlusion of left cerebellar artery | Yes |
| 42539161 | 7,63E+08 | Occlusion of left cerebellar artery by embolus | Yes |
| 42535509 | 3,29E+14 | Occlusion of left middle cerebral artery | Yes |
| 42538819 | 7,63E+08 | Occlusion of left middle cerebral artery by embolus | Yes |
| 42536338 | 7,35E+08 | Occlusion of left pontine artery | Yes |
| 42535510 | 3,3E+14 | Occlusion of left posterior cerebral artery | Yes |
| 42538981 | 7,63E+08 | Occlusion of left posterior cerebral artery by embolus | Yes |
| 764447 | 4,55E+14 | Occlusion of left posterior communicating artery | Yes |
| 42535457 | 2,93E+14 | Occlusion of left vertebral artery | Yes |
| 762341 | 3,3E+14 | Occlusion of right anterior cerebral artery | Yes |
| 42539514 | 7,35E+08 | Occlusion of right cerebellar artery | Yes |
| 42538820 | 7,63E+08 | Occlusion of right cerebellar artery by embolus | Yes |
| 42539276 | 3,29E+14 | Occlusion of right middle cerebral artery | Yes |
| 42538818 | 7,63E+08 | Occlusion of right middle cerebral artery by embolus | Yes |
| 42536337 | 7,35E+08 | Occlusion of right pontine artery | Yes |
| 42539787 | 3,3E+14 | Occlusion of right posterior cerebral artery | Yes |
| 42538828 | 7,63E+08 | Occlusion of right posterior cerebral artery by embolus | Yes |
| 764446 | 4,55E+14 | Occlusion of right posterior communicating artery | Yes |
| 42535456 | 2,93E+14 | Occlusion of right vertebral artery | Yes |
| 764362 | 4,54E+14 | Occlusion of superior cerebellar artery | Yes |
| 764501 | 4,56E+14 | Occlusive embolus of left anterior cerebral | Yes |
| 764499 | 4,56E+14 | Occlusive embolus of left carotid artery | Yes |
| 764496 | 4,56E+14 | Occlusive embolus of left vertebral artery | Yes |
| 764502 | 4,56E+14 | Occlusive embolus of right anterior cerebral | Yes |
| 764500 | 4,56E+14 | Occlusive embolus of right carotid artery | Yes |
| 764497 | 4,56E+14 | Occlusive embolus of right vertebral artery | Yes |
| 4189462 | 3,74E+08 | Occlusive stroke | Yes |
| 764504 | 4,56E+14 | Occlusive thrombus of left cerebellar artery | Yes |
| 764506 | 4,56E+14 | Occlusive thrombus of left posterior cerebral artery | Yes |
| 764505 | 4,56E+14 | Occlusive thrombus of left vertebral artery | Yes |
| 4023571 | 1,16E+08 | Paralytic stroke | Yes |
| 36716757 | 7,23E+08 | Perinatal arterial ischemic stroke | Yes |
| 4080888 | 2,77E+08 | Perinatal cerebral ischemia | Yes |
| 4171108 | 2,77E+08 | Perinatal rupture of superficial cerebral vein | Yes |
| 318137 | 1,93E+08 | Phlebitis and thrombophlebitis of intracranial sinuses | Yes |
| 4104694 | 1,93E+08 | Phlebitis cavernous sinus | Yes |
| 4049750 | 15705007 | Phlebitis of basilar sinus | Yes |
| 4100119 | 1,93E+08 | Phlebitis of central nervous system venous sinuses | Yes |
| 4137761 | 32112006 | Phlebitis of inferior sagittal sinus | Yes |
| 4110676 | 18058007 | Phlebitis of intracranial venous sinus | Yes |
| 4229432 | 88755007 | Phlebitis of lateral venous sinus | Yes |
| 4102204 | 1,93E+08 | Phlebitis of superior longitudinal sinus | Yes |
| 4174848 | 4262001 | Phlebitis of superior sagittal sinus | Yes |
| 4263703 | 60706008 | Phlebitis of torcular Herophili | Yes |
| 4100120 | 1,93E+08 | Phlebitis transverse sinus | Yes |
| 4237180 | 4,09E+08 | Pontine artery occlusion | Yes |
| 4237181 | 4,09E+08 | Pontine artery thrombosis | Yes |
| 762954 | 4,34E+14 | Post-radiotherapy cerebral vasculopathy | Yes |
| 762628 | 4,3E+14 | Posterior cerebral artery embolism | Yes |
| 4110195 | 1,95E+08 | Posterior cerebral artery syndrome | Yes |
| 4045748 | 2,31E+08 | Posterior circulation stroke of uncertain pathology | Yes |
| 762631 | 4,3E+14 | Posterior inferior cerebellar artery embolism | Yes |
| 763095 | 4,36E+14 | Posterior inferior cerebellar artery occlusion with infarction | Yes |
| 4301259 | 78569004 | Posterior inferior cerebellar artery syndrome | Yes |
| 44784475 | 6,99E+08 | Postoperative phlebitis and thrombophlebitis of intracranial sinuses | Yes |
| 45766200 | 7,03E+08 | Primary cerebral arteritis | Yes |
| 4238315 | 57981008 | Progressing stroke | Yes |
| 4230479 | 89142007 | Progressive intracranial arterial occlusion | Yes |
| 764734 | 5,65E+12 | Pseudoaneurysm of vertebral artery | Yes |
| 442419 | 2E+08 | Puerperal cerebrovascular disorder - delivered | Yes |
| 442418 | 2E+08 | Puerperal cerebrovascular disorder - delivered with postnatal complication | Yes |
| 313272 | 2E+08 | Puerperal cerebrovascular disorder with antenatal complication | Yes |
| 313833 | 2E+08 | Puerperal cerebrovascular disorder with postnatal complication | Yes |
| 4263370 | 36179005 | R.I.N.D. syndrome | Yes |
| 763267 | 4,38E+14 | Recurrent artery of Huebner occlusion with infarction | Yes |
| 40485430 | 4,44E+08 | Recurrent transient cerebral ischemic attack | Yes |
| 45765600 | 7,03E+08 | Retinocochleocerebral vasculopathy | Yes |
| 45773220 | 7E+08 | Reversible cerebral vasoconstriction syndrome | Yes |
| 762339 | 3,29E+14 | Right anterior cerebral artery embolism with stroke | Yes |
| 761796 | 1,6E+16 | Right carotid artery embolism with stroke | Yes |
| 43020497 | 2,85E+14 | Right carotid artery occlusion | Yes |
| 43021859 | 2,85E+14 | Right carotid artery stenosis | Yes |
| 4110196 | 1,95E+08 | Right sided cerebral hemisphere cerebrovascular accident | Yes |
| 37117075 | 1,57E+16 | Right vertebral artery dissection | Yes |
| 761794 | 1,6E+16 | Right vertebral artery embolism with stroke | Yes |
| 4031946 | 23808003 | Rolandic vein occlusion syndrome | Yes |
| 4173794 | 2,75E+08 | Rupture of superficial cerebral vein | Yes |
| 380943 | 1,87E+08 | Rupture of syphilitic cerebral aneurysm | Yes |
| 762351 | 3,3E+14 | Ruptured acquired aneurysm of cerebral artery | Yes |
| 4079430 | 2,77E+08 | Ruptured aneurysm of anterior cerebral artery | Yes |
| 4079433 | 2,77E+08 | Ruptured aneurysm of anterior communicating artery | Yes |
| 4082161 | 2,77E+08 | Ruptured aneurysm of basilar artery | Yes |
| 764707 | 5,47E+12 | Ruptured aneurysm of intracranial artery | Yes |
| 42536193 | 7,35E+08 | Ruptured aneurysm of left posterior communicating artery | Yes |
| 4079431 | 2,77E+08 | Ruptured aneurysm of middle cerebral artery | Yes |
| 4079432 | 2,77E+08 | Ruptured aneurysm of posterior cerebral artery | Yes |
| 4079434 | 2,77E+08 | Ruptured aneurysm of posterior communicating artery | Yes |
| 4082162 | 2,77E+08 | Ruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 42536192 | 7,35E+08 | Ruptured aneurysm of right posterior communicating artery | Yes |
| 45766085 | 7,03E+08 | Ruptured aneurysm of vertebral artery | Yes |
| 4111707 | 1,95E+08 | Ruptured berry aneurysm | Yes |
| 4120104 | 2,34E+08 | Ruptured cerebral aneurysm | Yes |
| 4079424 | 2,77E+08 | Ruptured cerebral arteriovenous malformation | Yes |
| 4079021 | 2,77E+08 | Ruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4082163 | 2,77E+08 | Ruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 45773166 | 7,03E+08 | Secondary cerebrovascular disease | Yes |
| 4047634 | 2,3E+08 | Septic thrombophlebitis of cortical vein | Yes |
| 4043901 | 2,3E+08 | Septic thrombophlebitis of great cerebral vein | Yes |
| 4121335 | 3,03E+08 | Septic thrombophlebitis of lateral sinus | Yes |
| 4119136 | 3,03E+08 | Septic thrombophlebitis of sagittal sinus | Yes |
| 4041680 | 2,3E+08 | Septic thrombophlebitis of sigmoid sinus | Yes |
| 4041679 | 2,3E+08 | Septic thrombophlebitis of straight sinus | Yes |
| 36717605 | 7,23E+08 | Silent cerebral infarct | Yes |
| 37109909 | 7,24E+08 | Silent micro-hemorrhage of brain | Yes |
| 4179790 | 50751005 | Sinus pericranii | Yes |
| 40484120 | 4,44E+08 | Small vessel cerebrovascular disease | Yes |
| 37396805 | 7,17E+08 | Sneddon syndrome | Yes |
| 4249605 | 73173006 | Spasm of cerebral arteries | Yes |
| 43530636 | 1,28E+14 | Spontaneous caroticocavernous sinus fistula | Yes |
| 43530727 | 2,92E+14 | Spontaneous cerebral hemorrhage | Yes |
| 46273491 | 1,41E+14 | Spontaneous cerebral hemorrhage with compression of brain | Yes |
| 42535421 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from intracranial artery | Yes |
| 762095 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from left middle cerebral artery | Yes |
| 42535422 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from left posterior communicating artery | Yes |
| 42539183 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from right posterior communicating artery | Yes |
| 42535879 | 7,34E+08 | Spontaneous rupture of left posterior communicating artery | Yes |
| 42535880 | 7,34E+08 | Spontaneous rupture of right posterior communicating artery | Yes |
| 4045750 | 2,31E+08 | Sporadic cerebral amyloid angiopathy | Yes |
| 760985 | 1,27E+16 | Stenosis of cavernous portion of right internal carotid artery | Yes |
| 761994 | 2,78E+16 | Stenosis of intracranial vessel | Yes |
| 42538826 | 7,63E+08 | Stenosis of left cerebellar artery | Yes |
| 765404 | 2,13E+16 | Stenosis of middle cerebral artery | Yes |
| 374371 | 1055001 | Stenosis of precerebral artery | Yes |
| 42538980 | 7,63E+08 | Stenosis of right cerebellar artery | Yes |
| 37110241 | 7,24E+08 | Stroke co-occurrent with migraine | Yes |
| 4168056 | 2,75E+08 | Stroke in the puerperium | Yes |
| 4046363 | 2,31E+08 | Stroke of uncertain pathology | Yes |
| 4111708 | 1,95E+08 | Subarachnoid hemorrhage from vertebral artery | Yes |
| 4234089 | 90099008 | Subcortical leukoencephalopathy | Yes |
| 765488 | 4,3E+14 | Superior cerebellar artery embolism | Yes |
| 40480273 | 4,45E+08 | Superior cerebellar artery syndrome | Yes |
| 44784634 | 9,61E+12 | Symptomatic carotid artery stenosis | Yes |
| 4048790 | 2,31E+08 | Syphilitic cerebral arteritis | Yes |
| 4318863 | 95644001 | Systemic lupus erythematosus encephalitis | Yes |
| 764716 | 5,53E+12 | Thrombophlebitis of basal vein of Rosenthal | Yes |
| 4100223 | 1,93E+08 | Thrombophlebitis of central nervous system venous sinuses | Yes |
| 4319332 | 95461006 | Thrombophlebitis of cerebral vein | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 764712 | 5,5E+12 | Thrombophlebitis of internal cerebral vein | Yes |
| 764714 | 5,51E+12 | Thrombophlebitis of sigmoid sinus | Yes |
| 764708 | 5,48E+12 | Thrombophlebitis of straight sinus | Yes |
| 763149 | 4,37E+14 | Thrombophlebitis of superior anastomotic vein | Yes |
| 4100224 | 1,93E+08 | Thrombophlebitis of superior longitudinal venous sinus | Yes |
| 4098706 | 26954004 | Thrombophlebitis of superior sagittal sinus | Yes |
| 4277833 | 3681008 | Thrombophlebitis of torcular Herophili | Yes |
| 764710 | 5,49E+12 | Thrombophlebitis of transverse sinus | Yes |
| 764701 | 5,43E+12 | Thrombosis of anterior cerebral artery | Yes |
| 764705 | 5,46E+12 | Thrombosis of anterior inferior cerebellar artery | Yes |
| 764726 | 5,61E+12 | Thrombosis of basal vein | Yes |
| 4228209 | 88922007 | Thrombosis of basilar sinus | Yes |
| 4234264 | 89980009 | Thrombosis of cavernous venous sinus | Yes |
| 762828 | 4,32E+14 | Thrombosis of cerebral medullary veins | Yes |
| 4319329 | 95455008 | Thrombosis of cerebral veins | Yes |
| 4048890 | 15742000 | Thrombosis of inferior sagittal sinus | Yes |
| 4273550 | 63795001 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Yes |
| 4057329 | 21258007 | Thrombosis of lateral venous sinus | Yes |
| 42535874 | 7,34E+08 | Thrombosis of left middle cerebral artery | Yes |
| 42535097 | 1,6E+16 | Thrombosis of left vertebral artery | Yes |
| 45767657 | 7,05E+08 | Thrombosis of middle cerebral artery | Yes |
| 764722 | 5,58E+12 | Thrombosis of posterior cerebral artery | Yes |
| 4144150 | 4,26E+08 | Thrombosis of posterior communicating artery | Yes |
| 764725 | 5,6E+12 | Thrombosis of posterior inferior cerebellar artery | Yes |
| 4171853 | 48601002 | Thrombosis of precerebral artery | Yes |
| 42538998 | 7,34E+08 | Thrombosis of right middle cerebral artery | Yes |
| 42535096 | 1,6E+16 | Thrombosis of right vertebral artery | Yes |
| 764723 | 5,59E+12 | Thrombosis of superior anastomotic vein | Yes |
| 764703 | 5,45E+12 | Thrombosis of superior cerebellar artery | Yes |
| 4102203 | 1,93E+08 | Thrombosis of superior longitudinal sinus | Yes |
| 4290940 | 70607008 | Thrombosis of superior sagittal sinus | Yes |
| 4079905 | 18322005 | Thrombosis of torcular Herophili | Yes |
| 4105338 | 1,93E+08 | Thrombosis transverse sinus | Yes |
| 4159140 | 3,71E+08 | Thrombotic stroke | Yes |
| 4134159 | 2,63E+08 | Transection of vertebral artery | Yes |
| 373503 | 2,66E+08 | Transient cerebral ischemia | Yes |
| 4139517 | 4,27E+08 | Transient cerebral ischemia due to atrial fibrillation | Yes |
| 46272244 | 7,11E+08 | Transient ischemic attack due to embolism | Yes |
| 4077197 | 2,76E+08 | Unruptured aneurysm of anterior cerebral artery | Yes |
| 4077199 | 2,76E+08 | Unruptured aneurysm of anterior communicating artery | Yes |
| 4078444 | 2,76E+08 | Unruptured aneurysm of basilar artery | Yes |
| 4077957 | 2,76E+08 | Unruptured aneurysm of middle cerebral artery | Yes |
| 4077198 | 2,76E+08 | Unruptured aneurysm of posterior cerebral artery | Yes |
| 4078443 | 2,76E+08 | Unruptured aneurysm of posterior communicating artery | Yes |
| 4078445 | 2,76E+08 | Unruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 4079429 | 2,77E+08 | Unruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4079427 | 2,77E+08 | Unruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 4215653 | 4,17E+08 | Vein of Galen malformation | Yes |
| 4180026 | 2,97E+08 | Vertebral artery aneurysm | Yes |
| 4274969 | 65084004 | Vertebral artery embolism | Yes |
| 4185117 | 43658003 | Vertebral artery obstruction | Yes |
| 439296 | 1,95E+08 | Vertebral artery occlusion | Yes |
| 763003 | 4,35E+14 | Vertebral artery occlusion with infarction | Yes |
| 763035 | 4,35E+14 | Vertebral artery occlusion without infarction | Yes |
| 4121637 | 2,34E+08 | Vertebral artery rupture | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 4301259 | 78569004 | Posterior inferior cerebellar artery syndrome | Yes |
| 44784475 | 6,99E+08 | Postoperative phlebitis and thrombophlebitis of intracranial sinuses | Yes |
| 45766200 | 7,03E+08 | Primary cerebral arteritis | Yes |
| 4238315 | 57981008 | Progressing stroke | Yes |
| 4230479 | 89142007 | Progressive intracranial arterial occlusion | Yes |
| 764734 | 5,65E+12 | Pseudoaneurysm of vertebral artery | Yes |
| 442419 | 2E+08 | Puerperal cerebrovascular disorder - delivered | Yes |
| 442418 | 2E+08 | Puerperal cerebrovascular disorder - delivered with postnatal complication | Yes |
| 313272 | 2E+08 | Puerperal cerebrovascular disorder with antenatal complication | Yes |
| 313833 | 2E+08 | Puerperal cerebrovascular disorder with postnatal complication | Yes |
| 4263370 | 36179005 | R.I.N.D. syndrome | Yes |
| 763267 | 4,38E+14 | Recurrent artery of Huebner occlusion with infarction | Yes |
| 40485430 | 4,44E+08 | Recurrent transient cerebral ischemic attack | Yes |
| 45765600 | 7,03E+08 | Retinocochleocerebral vasculopathy | Yes |
| 45773220 | 7E+08 | Reversible cerebral vasoconstriction syndrome | Yes |
| 762339 | 3,29E+14 | Right anterior cerebral artery embolism with stroke | Yes |
| 761796 | 1,6E+16 | Right carotid artery embolism with stroke | Yes |
| 43020497 | 2,85E+14 | Right carotid artery occlusion | Yes |
| 43021859 | 2,85E+14 | Right carotid artery stenosis | Yes |
| 4110196 | 1,95E+08 | Right sided cerebral hemisphere cerebrovascular accident | Yes |
| 37117075 | 1,57E+16 | Right vertebral artery dissection | Yes |
| 761794 | 1,6E+16 | Right vertebral artery embolism with stroke | Yes |
| 4031946 | 23808003 | Rolandic vein occlusion syndrome | Yes |
| 4173794 | 2,75E+08 | Rupture of superficial cerebral vein | Yes |
| 380943 | 1,87E+08 | Rupture of syphilitic cerebral aneurysm | Yes |
| 762351 | 3,3E+14 | Ruptured acquired aneurysm of cerebral artery | Yes |
| 4079430 | 2,77E+08 | Ruptured aneurysm of anterior cerebral artery | Yes |
| 4079433 | 2,77E+08 | Ruptured aneurysm of anterior communicating artery | Yes |
| 4082161 | 2,77E+08 | Ruptured aneurysm of basilar artery | Yes |
| 764707 | 5,47E+12 | Ruptured aneurysm of intracranial artery | Yes |
| 42536193 | 7,35E+08 | Ruptured aneurysm of left posterior communicating artery | Yes |
| 4079431 | 2,77E+08 | Ruptured aneurysm of middle cerebral artery | Yes |
| 4079432 | 2,77E+08 | Ruptured aneurysm of posterior cerebral artery | Yes |
| 4079434 | 2,77E+08 | Ruptured aneurysm of posterior communicating artery | Yes |
| 4082162 | 2,77E+08 | Ruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 42536192 | 7,35E+08 | Ruptured aneurysm of right posterior communicating artery | Yes |
| 45766085 | 7,03E+08 | Ruptured aneurysm of vertebral artery | Yes |
| 4111707 | 1,95E+08 | Ruptured berry aneurysm | Yes |
| 4120104 | 2,34E+08 | Ruptured cerebral aneurysm | Yes |
| 4079424 | 2,77E+08 | Ruptured cerebral arteriovenous malformation | Yes |
| 4079021 | 2,77E+08 | Ruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4082163 | 2,77E+08 | Ruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 45773166 | 7,03E+08 | Secondary cerebrovascular disease | Yes |
| 4047634 | 2,3E+08 | Septic thrombophlebitis of cortical vein | Yes |
| 4043901 | 2,3E+08 | Septic thrombophlebitis of great cerebral vein | Yes |
| 4121335 | 3,03E+08 | Septic thrombophlebitis of lateral sinus | Yes |
| 4119136 | 3,03E+08 | Septic thrombophlebitis of sagittal sinus | Yes |
| 4041680 | 2,3E+08 | Septic thrombophlebitis of sigmoid sinus | Yes |
| 4041679 | 2,3E+08 | Septic thrombophlebitis of straight sinus | Yes |
| 36717605 | 7,23E+08 | Silent cerebral infarct | Yes |
| 37109909 | 7,24E+08 | Silent micro-hemorrhage of brain | Yes |
| 4179790 | 50751005 | Sinus pericranii | Yes |
| 40484120 | 4,44E+08 | Small vessel cerebrovascular disease | Yes |
| 37396805 | 7,17E+08 | Sneddon syndrome | Yes |
| 4249605 | 73173006 | Spasm of cerebral arteries | Yes |
| 43530636 | 1,28E+14 | Spontaneous caroticocavernous sinus fistula | Yes |
| 43530727 | 2,92E+14 | Spontaneous cerebral hemorrhage | Yes |
| 46273491 | 1,41E+14 | Spontaneous cerebral hemorrhage with compression of brain | Yes |
| 42535421 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from intracranial artery | Yes |
| 762095 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from left middle cerebral artery | Yes |
| 42535422 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from left posterior communicating artery | Yes |
| 42539183 | 2,91E+14 | Spontaneous hemorrhage of subarachnoid space from right posterior communicating artery | Yes |
| 42535879 | 7,34E+08 | Spontaneous rupture of left posterior communicating artery | Yes |
| 42535880 | 7,34E+08 | Spontaneous rupture of right posterior communicating artery | Yes |
| 4045750 | 2,31E+08 | Sporadic cerebral amyloid angiopathy | Yes |
| 760985 | 1,27E+16 | Stenosis of cavernous portion of right internal carotid artery | Yes |
| 761994 | 2,78E+16 | Stenosis of intracranial vessel | Yes |
| 42538826 | 7,63E+08 | Stenosis of left cerebellar artery | Yes |
| 765404 | 2,13E+16 | Stenosis of middle cerebral artery | Yes |
| 374371 | 1055001 | Stenosis of precerebral artery | Yes |
| 42538980 | 7,63E+08 | Stenosis of right cerebellar artery | Yes |
| 37110241 | 7,24E+08 | Stroke co-occurrent with migraine | Yes |
| 4168056 | 2,75E+08 | Stroke in the puerperium | Yes |
| 4046363 | 2,31E+08 | Stroke of uncertain pathology | Yes |
| 4111708 | 1,95E+08 | Subarachnoid hemorrhage from vertebral artery | Yes |
| 4234089 | 90099008 | Subcortical leukoencephalopathy | Yes |
| 765488 | 4,3E+14 | Superior cerebellar artery embolism | Yes |
| 40480273 | 4,45E+08 | Superior cerebellar artery syndrome | Yes |
| 44784634 | 9,61E+12 | Symptomatic carotid artery stenosis | Yes |
| 4048790 | 2,31E+08 | Syphilitic cerebral arteritis | Yes |
| 4318863 | 95644001 | Systemic lupus erythematosus encephalitis | Yes |
| 764716 | 5,53E+12 | Thrombophlebitis of basal vein of Rosenthal | Yes |
| 4100223 | 1,93E+08 | Thrombophlebitis of central nervous system venous sinuses | Yes |
| 4319332 | 95461006 | Thrombophlebitis of cerebral vein | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 764712 | 5,5E+12 | Thrombophlebitis of internal cerebral vein | Yes |
| 764714 | 5,51E+12 | Thrombophlebitis of sigmoid sinus | Yes |
| 764708 | 5,48E+12 | Thrombophlebitis of straight sinus | Yes |
| 763149 | 4,37E+14 | Thrombophlebitis of superior anastomotic vein | Yes |
| 4100224 | 1,93E+08 | Thrombophlebitis of superior longitudinal venous sinus | Yes |
| 4098706 | 26954004 | Thrombophlebitis of superior sagittal sinus | Yes |
| 4277833 | 3681008 | Thrombophlebitis of torcular Herophili | Yes |
| 764710 | 5,49E+12 | Thrombophlebitis of transverse sinus | Yes |
| 764701 | 5,43E+12 | Thrombosis of anterior cerebral artery | Yes |
| 764705 | 5,46E+12 | Thrombosis of anterior inferior cerebellar artery | Yes |
| 764726 | 5,61E+12 | Thrombosis of basal vein | Yes |
| 4228209 | 88922007 | Thrombosis of basilar sinus | Yes |
| 4234264 | 89980009 | Thrombosis of cavernous venous sinus | Yes |
| 762828 | 4,32E+14 | Thrombosis of cerebral medullary veins | Yes |
| 4319329 | 95455008 | Thrombosis of cerebral veins | Yes |
| 4048890 | 15742000 | Thrombosis of inferior sagittal sinus | Yes |
| 4273550 | 63795001 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Yes |
| 4057329 | 21258007 | Thrombosis of lateral venous sinus | Yes |
| 42535874 | 7,34E+08 | Thrombosis of left middle cerebral artery | Yes |
| 42535097 | 1,6E+16 | Thrombosis of left vertebral artery | Yes |
| 45767657 | 7,05E+08 | Thrombosis of middle cerebral artery | Yes |
| 764722 | 5,58E+12 | Thrombosis of posterior cerebral artery | Yes |
| 4144150 | 4,26E+08 | Thrombosis of posterior communicating artery | Yes |
| 764725 | 5,6E+12 | Thrombosis of posterior inferior cerebellar artery | Yes |
| 4171853 | 48601002 | Thrombosis of precerebral artery | Yes |
| 42538998 | 7,34E+08 | Thrombosis of right middle cerebral artery | Yes |
| 42535096 | 1,6E+16 | Thrombosis of right vertebral artery | Yes |
| 764723 | 5,59E+12 | Thrombosis of superior anastomotic vein | Yes |
| 764703 | 5,45E+12 | Thrombosis of superior cerebellar artery | Yes |
| 4102203 | 1,93E+08 | Thrombosis of superior longitudinal sinus | Yes |
| 4290940 | 70607008 | Thrombosis of superior sagittal sinus | Yes |
| 4079905 | 18322005 | Thrombosis of torcular Herophili | Yes |
| 4105338 | 1,93E+08 | Thrombosis transverse sinus | Yes |
| 4159140 | 3,71E+08 | Thrombotic stroke | Yes |
| 4134159 | 2,63E+08 | Transection of vertebral artery | Yes |
| 373503 | 2,66E+08 | Transient cerebral ischemia | Yes |
| 4139517 | 4,27E+08 | Transient cerebral ischemia due to atrial fibrillation | Yes |
| 46272244 | 7,11E+08 | Transient ischemic attack due to embolism | Yes |
| 4077197 | 2,76E+08 | Unruptured aneurysm of anterior cerebral artery | Yes |
| 4077199 | 2,76E+08 | Unruptured aneurysm of anterior communicating artery | Yes |
| 4078444 | 2,76E+08 | Unruptured aneurysm of basilar artery | Yes |
| 4077957 | 2,76E+08 | Unruptured aneurysm of middle cerebral artery | Yes |
| 4077198 | 2,76E+08 | Unruptured aneurysm of posterior cerebral artery | Yes |
| 4078443 | 2,76E+08 | Unruptured aneurysm of posterior communicating artery | Yes |
| 4078445 | 2,76E+08 | Unruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 4079429 | 2,77E+08 | Unruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4079427 | 2,77E+08 | Unruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 4215653 | 4,17E+08 | Vein of Galen malformation | Yes |
| 4180026 | 2,97E+08 | Vertebral artery aneurysm | Yes |
| 4274969 | 65084004 | Vertebral artery embolism | Yes |
| 4185117 | 43658003 | Vertebral artery obstruction | Yes |
| 439296 | 1,95E+08 | Vertebral artery occlusion | Yes |
| 763003 | 4,35E+14 | Vertebral artery occlusion with infarction | Yes |
| 763035 | 4,35E+14 | Vertebral artery occlusion without infarction | Yes |
| 4121637 | 2,34E+08 | Vertebral artery rupture | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 764712 | 5,5E+12 | Thrombophlebitis of internal cerebral vein | Yes |
| 764714 | 5,51E+12 | Thrombophlebitis of sigmoid sinus | Yes |
| 764708 | 5,48E+12 | Thrombophlebitis of straight sinus | Yes |
| 763149 | 4,37E+14 | Thrombophlebitis of superior anastomotic vein | Yes |
| 4100224 | 1,93E+08 | Thrombophlebitis of superior longitudinal venous sinus | Yes |
| 4098706 | 26954004 | Thrombophlebitis of superior sagittal sinus | Yes |
| 4277833 | 3681008 | Thrombophlebitis of torcular Herophili | Yes |
| 764710 | 5,49E+12 | Thrombophlebitis of transverse sinus | Yes |
| 764701 | 5,43E+12 | Thrombosis of anterior cerebral artery | Yes |
| 764705 | 5,46E+12 | Thrombosis of anterior inferior cerebellar artery | Yes |
| 764726 | 5,61E+12 | Thrombosis of basal vein | Yes |
| 4228209 | 88922007 | Thrombosis of basilar sinus | Yes |
| 4234264 | 89980009 | Thrombosis of cavernous venous sinus | Yes |
| 762828 | 4,32E+14 | Thrombosis of cerebral medullary veins | Yes |
| 4319329 | 95455008 | Thrombosis of cerebral veins | Yes |
| 4048890 | 15742000 | Thrombosis of inferior sagittal sinus | Yes |
| 4273550 | 63795001 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Yes |
| 4057329 | 21258007 | Thrombosis of lateral venous sinus | Yes |
| 42535874 | 7,34E+08 | Thrombosis of left middle cerebral artery | Yes |
| 42535097 | 1,6E+16 | Thrombosis of left vertebral artery | Yes |
| 45767657 | 7,05E+08 | Thrombosis of middle cerebral artery | Yes |
| 764722 | 5,58E+12 | Thrombosis of posterior cerebral artery | Yes |
| 4144150 | 4,26E+08 | Thrombosis of posterior communicating artery | Yes |
| 764725 | 5,6E+12 | Thrombosis of posterior inferior cerebellar artery | Yes |
| 4171853 | 48601002 | Thrombosis of precerebral artery | Yes |
| 42538998 | 7,34E+08 | Thrombosis of right middle cerebral artery | Yes |
| 42535096 | 1,6E+16 | Thrombosis of right vertebral artery | Yes |
| 764723 | 5,59E+12 | Thrombosis of superior anastomotic vein | Yes |
| 764703 | 5,45E+12 | Thrombosis of superior cerebellar artery | Yes |
| 4102203 | 1,93E+08 | Thrombosis of superior longitudinal sinus | Yes |
| 4290940 | 70607008 | Thrombosis of superior sagittal sinus | Yes |
| 4079905 | 18322005 | Thrombosis of torcular Herophili | Yes |
| 4105338 | 1,93E+08 | Thrombosis transverse sinus | Yes |
| 4159140 | 3,71E+08 | Thrombotic stroke | Yes |
| 4134159 | 2,63E+08 | Transection of vertebral artery | Yes |
| 373503 | 2,66E+08 | Transient cerebral ischemia | Yes |
| 4139517 | 4,27E+08 | Transient cerebral ischemia due to atrial fibrillation | Yes |
| 46272244 | 7,11E+08 | Transient ischemic attack due to embolism | Yes |
| 4077197 | 2,76E+08 | Unruptured aneurysm of anterior cerebral artery | Yes |
| 4077199 | 2,76E+08 | Unruptured aneurysm of anterior communicating artery | Yes |
| 4078444 | 2,76E+08 | Unruptured aneurysm of basilar artery | Yes |
| 4077957 | 2,76E+08 | Unruptured aneurysm of middle cerebral artery | Yes |
| 4077198 | 2,76E+08 | Unruptured aneurysm of posterior cerebral artery | Yes |
| 4078443 | 2,76E+08 | Unruptured aneurysm of posterior communicating artery | Yes |
| 4078445 | 2,76E+08 | Unruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 4079429 | 2,77E+08 | Unruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4079427 | 2,77E+08 | Unruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 4215653 | 4,17E+08 | Vein of Galen malformation | Yes |
| 4180026 | 2,97E+08 | Vertebral artery aneurysm | Yes |
| 4274969 | 65084004 | Vertebral artery embolism | Yes |
| 4185117 | 43658003 | Vertebral artery obstruction | Yes |
| 439296 | 1,95E+08 | Vertebral artery occlusion | Yes |
| 763003 | 4,35E+14 | Vertebral artery occlusion with infarction | Yes |
| 763035 | 4,35E+14 | Vertebral artery occlusion without infarction | Yes |
| 4121637 | 2,34E+08 | Vertebral artery rupture | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 764712 | 5,5E+12 | Thrombophlebitis of internal cerebral vein | Yes |
| 764714 | 5,51E+12 | Thrombophlebitis of sigmoid sinus | Yes |
| 764708 | 5,48E+12 | Thrombophlebitis of straight sinus | Yes |
| 763149 | 4,37E+14 | Thrombophlebitis of superior anastomotic vein | Yes |
| 4100224 | 1,93E+08 | Thrombophlebitis of superior longitudinal venous sinus | Yes |
| 4098706 | 26954004 | Thrombophlebitis of superior sagittal sinus | Yes |
| 4277833 | 3681008 | Thrombophlebitis of torcular Herophili | Yes |
| 764710 | 5,49E+12 | Thrombophlebitis of transverse sinus | Yes |
| 764701 | 5,43E+12 | Thrombosis of anterior cerebral artery | Yes |
| 764705 | 5,46E+12 | Thrombosis of anterior inferior cerebellar artery | Yes |
| 764726 | 5,61E+12 | Thrombosis of basal vein | Yes |
| 4228209 | 88922007 | Thrombosis of basilar sinus | Yes |
| 4234264 | 89980009 | Thrombosis of cavernous venous sinus | Yes |
| 762828 | 4,32E+14 | Thrombosis of cerebral medullary veins | Yes |
| 4319329 | 95455008 | Thrombosis of cerebral veins | Yes |
| 4048890 | 15742000 | Thrombosis of inferior sagittal sinus | Yes |
| 4273550 | 63795001 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Yes |
| 4057329 | 21258007 | Thrombosis of lateral venous sinus | Yes |
| 42535874 | 7,34E+08 | Thrombosis of left middle cerebral artery | Yes |
| 42535097 | 1,6E+16 | Thrombosis of left vertebral artery | Yes |
| 45767657 | 7,05E+08 | Thrombosis of middle cerebral artery | Yes |
| 764722 | 5,58E+12 | Thrombosis of posterior cerebral artery | Yes |
| 4144150 | 4,26E+08 | Thrombosis of posterior communicating artery | Yes |
| 764725 | 5,6E+12 | Thrombosis of posterior inferior cerebellar artery | Yes |
| 4171853 | 48601002 | Thrombosis of precerebral artery | Yes |
| 42538998 | 7,34E+08 | Thrombosis of right middle cerebral artery | Yes |
| 42535096 | 1,6E+16 | Thrombosis of right vertebral artery | Yes |
| 764723 | 5,59E+12 | Thrombosis of superior anastomotic vein | Yes |
| 764703 | 5,45E+12 | Thrombosis of superior cerebellar artery | Yes |
| 4102203 | 1,93E+08 | Thrombosis of superior longitudinal sinus | Yes |
| 4290940 | 70607008 | Thrombosis of superior sagittal sinus | Yes |
| 4079905 | 18322005 | Thrombosis of torcular Herophili | Yes |
| 4105338 | 1,93E+08 | Thrombosis transverse sinus | Yes |
| 4159140 | 3,71E+08 | Thrombotic stroke | Yes |
| 4134159 | 2,63E+08 | Transection of vertebral artery | Yes |
| 373503 | 2,66E+08 | Transient cerebral ischemia | Yes |
| 4139517 | 4,27E+08 | Transient cerebral ischemia due to atrial fibrillation | Yes |
| 46272244 | 7,11E+08 | Transient ischemic attack due to embolism | Yes |
| 4077197 | 2,76E+08 | Unruptured aneurysm of anterior cerebral artery | Yes |
| 4077199 | 2,76E+08 | Unruptured aneurysm of anterior communicating artery | Yes |
| 4078444 | 2,76E+08 | Unruptured aneurysm of basilar artery | Yes |
| 4077957 | 2,76E+08 | Unruptured aneurysm of middle cerebral artery | Yes |
| 4077198 | 2,76E+08 | Unruptured aneurysm of posterior cerebral artery | Yes |
| 4078443 | 2,76E+08 | Unruptured aneurysm of posterior communicating artery | Yes |
| 4078445 | 2,76E+08 | Unruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 4079429 | 2,77E+08 | Unruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4079427 | 2,77E+08 | Unruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 4215653 | 4,17E+08 | Vein of Galen malformation | Yes |
| 4180026 | 2,97E+08 | Vertebral artery aneurysm | Yes |
| 4274969 | 65084004 | Vertebral artery embolism | Yes |
| 4185117 | 43658003 | Vertebral artery obstruction | Yes |
| 439296 | 1,95E+08 | Vertebral artery occlusion | Yes |
| 763003 | 4,35E+14 | Vertebral artery occlusion with infarction | Yes |
| 763035 | 4,35E+14 | Vertebral artery occlusion without infarction | Yes |
| 4121637 | 2,34E+08 | Vertebral artery rupture | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 764712 | 5,5E+12 | Thrombophlebitis of internal cerebral vein | Yes |
| 764714 | 5,51E+12 | Thrombophlebitis of sigmoid sinus | Yes |
| 764708 | 5,48E+12 | Thrombophlebitis of straight sinus | Yes |
| 763149 | 4,37E+14 | Thrombophlebitis of superior anastomotic vein | Yes |
| 4100224 | 1,93E+08 | Thrombophlebitis of superior longitudinal venous sinus | Yes |
| 4098706 | 26954004 | Thrombophlebitis of superior sagittal sinus | Yes |
| 4277833 | 3681008 | Thrombophlebitis of torcular Herophili | Yes |
| 764710 | 5,49E+12 | Thrombophlebitis of transverse sinus | Yes |
| 764701 | 5,43E+12 | Thrombosis of anterior cerebral artery | Yes |
| 764705 | 5,46E+12 | Thrombosis of anterior inferior cerebellar artery | Yes |
| 764726 | 5,61E+12 | Thrombosis of basal vein | Yes |
| 4228209 | 88922007 | Thrombosis of basilar sinus | Yes |
| 4234264 | 89980009 | Thrombosis of cavernous venous sinus | Yes |
| 762828 | 4,32E+14 | Thrombosis of cerebral medullary veins | Yes |
| 4319329 | 95455008 | Thrombosis of cerebral veins | Yes |
| 4048890 | 15742000 | Thrombosis of inferior sagittal sinus | Yes |
| 4273550 | 63795001 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Yes |
| 4057329 | 21258007 | Thrombosis of lateral venous sinus | Yes |
| 42535874 | 7,34E+08 | Thrombosis of left middle cerebral artery | Yes |
| 42535097 | 1,6E+16 | Thrombosis of left vertebral artery | Yes |
| 45767657 | 7,05E+08 | Thrombosis of middle cerebral artery | Yes |
| 764722 | 5,58E+12 | Thrombosis of posterior cerebral artery | Yes |
| 4144150 | 4,26E+08 | Thrombosis of posterior communicating artery | Yes |
| 764725 | 5,6E+12 | Thrombosis of posterior inferior cerebellar artery | Yes |
| 4171853 | 48601002 | Thrombosis of precerebral artery | Yes |
| 42538998 | 7,34E+08 | Thrombosis of right middle cerebral artery | Yes |
| 42535096 | 1,6E+16 | Thrombosis of right vertebral artery | Yes |
| 764723 | 5,59E+12 | Thrombosis of superior anastomotic vein | Yes |
| 764703 | 5,45E+12 | Thrombosis of superior cerebellar artery | Yes |
| 4102203 | 1,93E+08 | Thrombosis of superior longitudinal sinus | Yes |
| 4290940 | 70607008 | Thrombosis of superior sagittal sinus | Yes |
| 4079905 | 18322005 | Thrombosis of torcular Herophili | Yes |
| 4105338 | 1,93E+08 | Thrombosis transverse sinus | Yes |
| 4159140 | 3,71E+08 | Thrombotic stroke | Yes |
| 4134159 | 2,63E+08 | Transection of vertebral artery | Yes |
| 373503 | 2,66E+08 | Transient cerebral ischemia | Yes |
| 4139517 | 4,27E+08 | Transient cerebral ischemia due to atrial fibrillation | Yes |
| 46272244 | 7,11E+08 | Transient ischemic attack due to embolism | Yes |
| 4077197 | 2,76E+08 | Unruptured aneurysm of anterior cerebral artery | Yes |
| 4077199 | 2,76E+08 | Unruptured aneurysm of anterior communicating artery | Yes |
| 4078444 | 2,76E+08 | Unruptured aneurysm of basilar artery | Yes |
| 4077957 | 2,76E+08 | Unruptured aneurysm of middle cerebral artery | Yes |
| 4077198 | 2,76E+08 | Unruptured aneurysm of posterior cerebral artery | Yes |
| 4078443 | 2,76E+08 | Unruptured aneurysm of posterior communicating artery | Yes |
| 4078445 | 2,76E+08 | Unruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 4079429 | 2,77E+08 | Unruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4079427 | 2,77E+08 | Unruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 4215653 | 4,17E+08 | Vein of Galen malformation | Yes |
| 4180026 | 2,97E+08 | Vertebral artery aneurysm | Yes |
| 4274969 | 65084004 | Vertebral artery embolism | Yes |
| 4185117 | 43658003 | Vertebral artery obstruction | Yes |
| 439296 | 1,95E+08 | Vertebral artery occlusion | Yes |
| 763003 | 4,35E+14 | Vertebral artery occlusion with infarction | Yes |
| 763035 | 4,35E+14 | Vertebral artery occlusion without infarction | Yes |
| 4121637 | 2,34E+08 | Vertebral artery rupture | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 4167985 | 48248005 | Thrombophlebitis of inferior sagittal sinus | Yes |
| 764712 | 5,5E+12 | Thrombophlebitis of internal cerebral vein | Yes |
| 764714 | 5,51E+12 | Thrombophlebitis of sigmoid sinus | Yes |
| 764708 | 5,48E+12 | Thrombophlebitis of straight sinus | Yes |
| 763149 | 4,37E+14 | Thrombophlebitis of superior anastomotic vein | Yes |
| 4100224 | 1,93E+08 | Thrombophlebitis of superior longitudinal venous sinus | Yes |
| 4098706 | 26954004 | Thrombophlebitis of superior sagittal sinus | Yes |
| 4277833 | 3681008 | Thrombophlebitis of torcular Herophili | Yes |
| 764710 | 5,49E+12 | Thrombophlebitis of transverse sinus | Yes |
| 764701 | 5,43E+12 | Thrombosis of anterior cerebral artery | Yes |
| 764705 | 5,46E+12 | Thrombosis of anterior inferior cerebellar artery | Yes |
| 764726 | 5,61E+12 | Thrombosis of basal vein | Yes |
| 4228209 | 88922007 | Thrombosis of basilar sinus | Yes |
| 4234264 | 89980009 | Thrombosis of cavernous venous sinus | Yes |
| 762828 | 4,32E+14 | Thrombosis of cerebral medullary veins | Yes |
| 4319329 | 95455008 | Thrombosis of cerebral veins | Yes |
| 4048890 | 15742000 | Thrombosis of inferior sagittal sinus | Yes |
| 4273550 | 63795001 | Thrombosis of intracranial venous sinus of pregnancy AND/OR puerperium | Yes |
| 4057329 | 21258007 | Thrombosis of lateral venous sinus | Yes |
| 42535874 | 7,34E+08 | Thrombosis of left middle cerebral artery | Yes |
| 42535097 | 1,6E+16 | Thrombosis of left vertebral artery | Yes |
| 45767657 | 7,05E+08 | Thrombosis of middle cerebral artery | Yes |
| 764722 | 5,58E+12 | Thrombosis of posterior cerebral artery | Yes |
| 4144150 | 4,26E+08 | Thrombosis of posterior communicating artery | Yes |
| 764725 | 5,6E+12 | Thrombosis of posterior inferior cerebellar artery | Yes |
| 4171853 | 48601002 | Thrombosis of precerebral artery | Yes |
| 42538998 | 7,34E+08 | Thrombosis of right middle cerebral artery | Yes |
| 42535096 | 1,6E+16 | Thrombosis of right vertebral artery | Yes |
| 764723 | 5,59E+12 | Thrombosis of superior anastomotic vein | Yes |
| 764703 | 5,45E+12 | Thrombosis of superior cerebellar artery | Yes |
| 4102203 | 1,93E+08 | Thrombosis of superior longitudinal sinus | Yes |
| 4290940 | 70607008 | Thrombosis of superior sagittal sinus | Yes |
| 4079905 | 18322005 | Thrombosis of torcular Herophili | Yes |
| 4105338 | 1,93E+08 | Thrombosis transverse sinus | Yes |
| 4159140 | 3,71E+08 | Thrombotic stroke | Yes |
| 4134159 | 2,63E+08 | Transection of vertebral artery | Yes |
| 373503 | 2,66E+08 | Transient cerebral ischemia | Yes |
| 4139517 | 4,27E+08 | Transient cerebral ischemia due to atrial fibrillation | Yes |
| 46272244 | 7,11E+08 | Transient ischemic attack due to embolism | Yes |
| 4077197 | 2,76E+08 | Unruptured aneurysm of anterior cerebral artery | Yes |
| 4077199 | 2,76E+08 | Unruptured aneurysm of anterior communicating artery | Yes |
| 4078444 | 2,76E+08 | Unruptured aneurysm of basilar artery | Yes |
| 4077957 | 2,76E+08 | Unruptured aneurysm of middle cerebral artery | Yes |
| 4077198 | 2,76E+08 | Unruptured aneurysm of posterior cerebral artery | Yes |
| 4078443 | 2,76E+08 | Unruptured aneurysm of posterior communicating artery | Yes |
| 4078445 | 2,76E+08 | Unruptured aneurysm of posterior inferior cerebellar artery | Yes |
| 4079429 | 2,77E+08 | Unruptured internal carotid-anterior communicating artery zone aneurysm | Yes |
| 4079427 | 2,77E+08 | Unruptured internal carotid-posterior communicating artery zone aneurysm | Yes |
| 4215653 | 4,17E+08 | Vein of Galen malformation | Yes |
| 4180026 | 2,97E+08 | Vertebral artery aneurysm | Yes |
| 4274969 | 65084004 | Vertebral artery embolism | Yes |
| 4185117 | 43658003 | Vertebral artery obstruction | Yes |
| 439296 | 1,95E+08 | Vertebral artery occlusion | Yes |
| 763003 | 4,35E+14 | Vertebral artery occlusion with infarction | Yes |
| 763035 | 4,35E+14 | Vertebral artery occlusion without infarction | Yes |
| 4121637 | 2,34E+08 | Vertebral artery rupture | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
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| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
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| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
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| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
| 380423 | 90520006 | Vertebral artery stenosis | Yes |
| 763004 | 4,35E+14 | Vertebral artery stenosis with infarction | Yes |
| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
| 434656 | 34781003 | Vertebral artery syndrome | Yes |
| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
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| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
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| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |
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| 765609 | 4,35E+14 | Vertebral artery stenosis without infarction | Yes |
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| 4273526 | 64775002 | Vertebral artery thrombosis | Yes |
| 4048785 | 2,31E+08 | Vertebrobasilar territory transient ischemic attack | Yes |
| 4086178 | 24654003 | Weber-Gubler syndrome | Yes |
| 37110515 | 7,25E+08 | White matter disorder co-occurrent and due to cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy | Yes |

# 

# Annex 3: Signature pages

# Signature Page – Study Conduct Responsible & Epidemiologist

|  |  |
| --- | --- |
| **Title** | OT2DSI // Observational study of type 2 diabetes and its complications: a chronological overview using the OHDSI network |
| **Protocol version and date** | v 1.0, 12 MAR 2020 |
| **IMPACT study number** |  |
| **Study type / Study phase** | Observational, Phase IV  <PASS> Joint PASS:  YES  NO |
| **Medicinal product / Active substance / Medical Device / Combination Product** | N/A |
| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: David Vizcaya

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Signature Page – Study Safety Lead

|  |  |
| --- | --- |
| **Title** | OT2DSI // Observational study of type 2 diabetes and its complications: a chronological overview using the OHDSI network |
| **Protocol version and date** | v 1.0, 12 MAR 2020 |
| **IMPACT study number** |  |
| **Study type / Study phase** | Observational, Phase IV  <PASS> Joint PASS:  YES  NO |
| **Medicinal product / Active substance / Medical Device / Combination Product** | N/A |
| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: Andrea Horvat-Broecker

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Signature Page – Study Medical Expert

|  |  |
| --- | --- |
| **Title** | OT2DSI // Observational study of type 2 diabetes and its complications: a chronological overview using the OHDSI network |
| **Protocol version and date** | v 1.0, 12 MAR 2020 |
| **IMPACT study number** |  |
| **Study type / Study phase** | Observational, Phase IV  <PASS> Joint PASS:  YES  NO |
| **Medicinal product / Active substance / Medical Device / Combination Product** | N/A |
| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: Angela Zawattieri

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Signature Page – Study Health Economist & Outcomes Research (HEOR)

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| **Title** | OT2DSI // Observational study of type 2 diabetes and its complications: a chronological overview using the OHDSI network |
| **Protocol version and date** | v 1.0, 12 MAR 2020 |
| **IMPACT study number** |  |
| **Study type / Study phase** | Observational, Phase IV  <PASS> Joint PASS:  YES  NO |
| **Medicinal product / Active substance / Medical Device / Combination Product** | N/A |
| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: Kerstin Folkerts

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Signature Page – Study Epidemiologist

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| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: Irene Bezemer

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Signature Page – Study Epidemiologist

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| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: Christian Reich

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Signature Page – Study Statistician

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| **Study Initiator and Funder** | Bayer AG |

*The undersigned confirms that s/he agrees that the study will be conducted under the conditions described in the protocol.*

Print Name: George Argyriou

Date, Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The OHDSI phenotype library is the home for validated, high-quality cohort phenotypes that can be generated using the OMOP CDM. [↑](#footnote-ref-2)