# Protocol: EXAcerbations of COPD; Identification of riSkfactors for rEadmission EXAcise

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## Legislation

This study is approved by the Danish Patient Safety Authority (31-1521-34). Permission is given for registering data from patients admitted to one of the hospitals in the North Jutland Region in 2018 with an exacerbation of COPD. If a data-saturation on ECG and arterial blood gasses >85% is obtained, data from 2014-2017 may be accessed as well.

## General information

This protocol details how data is collected for the EXACISE (EXAcerbations of COPD; Identification of riSkfactors for rEadmission) database. The database was created using REDCap® (Vanderbilt University, Nashville, Tennesee, USA).

The data is collected from electronic medical records of patients admitted to hospital with the diagnosis exacerbation of chronic obstructive pulmonary disease (COPD) in 2018 in the North Denmark Region.

Multiple entry clerks have contributed to data collection. Data entry of at least three patients were controlled by another entry clerk.

If emergency access to medical records is necessary, case number 31-1521-34 is written as cause. Missing data is indicated by “NA”.

## Begin data collection

CPR-number in the format, xxxxxx-xxxx, is written under “Enter New Record Name”. By pressing “Create” one is led to the questionnaire.

## First admission, discharge, readmission, and mortality

**Date of admission:** The date of first admission with the diagnosis exacerbation of COPD in 2018. Patients with COPD admitted with pneumonias are included. The admission date must be in the year of 2018. Patients admitted in 2017 and discharged in 2018, are not included. An admission is defined as staying overnight. Evaluations in the emergency room and outpatient surgeries are not included in first admissions or readmissions. Patients diagnosed with COPD during admission to hospital with exacerbations are included.

If patients died during first admission they are included, and available data is collected.

Patients that develop pneumonias or exacerbations of COPD during hospitalisations due to other diagnoses are not included in the study.

**Discharge date:** Date of discharge following first admission

**Readmission:** Dates of readmissions the first 12 months following first admission are included. All readmissions are included regardless of diagnosis. No other data from readmissions is included. If no readmissions, the field is left clear.

**Number of psychiatric readmissions:** The number of readmissions to the psychiatric department.

**Mortality:** Date of death. If the patient died during readmission, the date of readmission and date of death are both included. If the patient is still alive at time of data collection, the field is left clear.

## Comorbidities

Comorbidities in accordance with the COPD specific comorbidity test (COTE) index are included. Furthermore, sleep apnoea is registered as a comorbidity. Data on comorbidities is collected from the admission record. If the medication list indicates that the patient has a relevant comorbidity not mentioned in the admission record, this may be included as long as there is no doubt to the indication for the medication, i.e. the medication is not used for several conditions. If the patient has no relevant comorbidities, the field is left clear.

**Lung cancer, lymphoma/leukaemia, and other cancers:** Cancers are separated into these three groups. “Other cancers” include all cancer types except lung cancer, leukaemia, lymphoma.

Cancers with low malignancy, specifically basocellular carcinoma, squamous cell carcinoma and cervix dysplasia were not included. Only the primary cancer is included, not metastasis. Cancers which have been cured are not included.

**Interstitial lung disease:** The comorbidity is only included if the condition has been diagnosed. Thus, lung fibrosis seen on an x-ray alone is not sufficient.

**Gastric- or duodenal ulcers:** Included if within five years of first admission.

**Stroke:** Transitory ischemic attack is not included.

**Depression:** Includes periodic depression, but not bipolar disorder.

**Chronic heart failure:** Cor pulmonale is only included if verified on an echocardiography.

## Health factors

**Smoking:**

*Active smoker:* Active smoking or having quit within six months of first admission.

*Former smoker:* Stopped smoking more than six months prior to first admission.

*Never smoked*: Nihil.

**Accumulated package year:** 1 package year equals an average of 20 cigarettes a day in a year. If noted as a range e.g., "10-15 package years", the highest number is selected.

**Alcohol:**

*No consumption:* Does not drink.

*Under the recommendations of the Danish Board of Health:* Less than or equal to 7 items a week for women and less than or equal to 14 items a week for men. "No overuse" and "on festive occasions", is included in this classification.

*Above the Danish Board of Health:* Over 7 items a week for women and over 14 items a week for men.

*Previous overuse:* The patient has previously had a harmful overuse.

Multiple fields can be selected if relevant.

**Number of items:** Number of alcoholic items per week. If noted as a range e.g., “5-7 items per week”, the highest number is selected.

**BMI:** Body mass index, either calculated by BMI calculator from NetDoktor[[1]](#footnote-1) using height and weight, or specified in notes during hospitalisation. If nothing is stated during first admission, BMI can be obtained from the spirometry used, see below under "Lung Function Examination".

## Oxygen treatment

**Oxygen treatment prior to hospitalisation:** Classified as either “No oxygen treatment”, “Oxygen through nasal cannula”, “High flow”, or “Non-invasive ventilation”**.**

**Oxygen treatment during hospitalisation:** Classified as either “No oxygen treatment”, “Oxygen through nasal cannula”, “High flow”, “Non-invasive ventilation” or “Respirator”.

**Oxygen treatment after hospitalisation:** Classified as either “No oxygen treatment”, “Oxygen through nasal cannula”, “High flow”, or “Non-invasive ventilation”**.**

All types of oxygen treatments given must be marked, both prior to, during, and after hospitalisation. If no oxygen treatment is mentioned, it is assumed that no oxygen treatment was given.

## Medication at time of admission

Data is extracted from admission record and if necessary, discharge papers. Discharge papers may only be used, if one is certain no changes in medication occurred during hospitalisation.

**Inhalation medication:** Categorised as “short acting beta2 agonist”, “long acting beta2 agonist”, “long acting muscarinic antagonist” and “corticosteroids”.

All relevant drug groups are marked. However, “short acting beta2 agonist” is only marked if used as monotherapy.

**Antiarrhythmic medication:** Categorised as “digoxin”, “metoprolol”, “cordarone”, “other” or “none”. The medications are only included if prescribed as treatment for atrial fibrillation or atrial flutter

**Anticoagulant medication:** Categorised as “acetylsalicylic acid”, “NOAC”, “VKA”, “other” or “none”. Platelet inhibitors are not included.

## Lung function

Test of lung function within an interval of three months prior to or after first admission. Examination of lung function prior to and closest to time of first admission is prioritised. If no tests were made in the three months prior to first admission, tests made in the three months after first admission. Lung function mentioned in admission record, may be used if notes from lung function test cannot be found. Parameters included are “FEV1” and “FEV1/FVC ratio”

## Electrocardiography

The first ECG made within 24 hours of first admission and the last ECG made during hospitalisation were analysed for arrhythmias and categorised as “atrial fibrillation or flutter”, “no atrial fibrillation or flutter”, “pace rhythm” or “no ECG available”.

## Biochemistry

Blood sample results within the first 24 hours of first admission is included. Data is collected for C-reactive protein (CRP), haemoglobin, albumin, creatinine kinase (CK-MB) and troponin-T/troponin-I (TNT). Up to three measurements of CK-MB and TNT are included.

## Arterial blood gas

Values from the first arterial blood gas within the first 24 hours of first admission is included. Data is collected for saturation, oxygen, carbon dioxide, bicarbonate, and pH-level.

If no arterial blood gas analysis is available, a venous gas analysis may be used for all values except oxygen and saturation. A peripheral saturation may be used instead.

## Admission and discharge report

**Cohabitation status:** Categorised as “single”, “cohabitant” or “married but not living together”.

**Housing status**: Data on housing status prior to and after hospitalisation is included, and categorised as “institution (nursing home, assisted living)” or “no institution”

**Home care**: Data on home help prior to and after hospitalisation is collected and categorise as “cleaning”, “dosage of medication”, “personal hygiene” and “no home care”. If a patient receives several types of home care, all relevant is marked.

1. <https://netdoktor.dk/interactive/interactivetests/bmi.php> [↑](#footnote-ref-1)