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The risk of selection bias in the Nor-COAST study.

A descriptive cross-sectional study.

Graduate thesis in Medicine
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Abstract:

Background and purpose:

Most studies on stroke-related dementia have challenges regarding patient recruitment. Often the sickest patients, who are also those with highest incidence of post stroke dementia (PSD), are excluded, and the consequence may be an underestimation of PSD in previous research. The aim of this study was to investigate if there was any selection bias in the Norwegian cognitive impairment after stroke (Nor-COAST) study, and to assess if the patients included in the Nor-COAST study differ from the patients not included.

Methods:

Patients with the diagnosis of acute stroke, admitted to one of the five participating hospitals were screened for inclusion in the Nor-COAST study. The inclusion criteria was 1) diagnosis of stroke according to the established WHO criteria, or with MRI findings compatible with acute infarction or intracerebral haemorrhage, 2) admitted to one of the 5 participating hospitals within one week after start of symptoms, 3) speak Norwegian, and 4) have a carer who was able to give supplementary information about cognition. In the present study, baseline data from the participants in the Nor-COAST study was compared to corresponding data from patients recruited to the Norwegian Stroke Registry (NHR) in the same period and who were not participating in Nor-COAST. Baseline characteristics in the two groups were investigated, to see if the participants in Nor-COAST differed from non-participants.

Results:

Altogether, 738 patients were included as participants and 1516 patients were included as non-participants. The following factors were associated with not participating in the Nor-COAST study: severe stroke, impaired function prior to stroke, living in institutions prior to stroke, cerebral haemorrhage, atrial fibrillation and recurrent stroke. At some of the hospitals, patients with left hemisphere stroke and older age tended to be excluded.

Conclusions:

The patients participating in the Nor-COAST study tended to have better general health condition, and milder strokes, compared to the patients not participating, and selection bias has most likely occurred in the Nor-COAST study. This must be taken into account when interpreting the future results of this study.

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1. Introduction

1.1 The burden of stroke

Vascular disease, usually due to atherosclerosis, is the most prevalent chronic disease in the developed world (GBD, 2017). Estimates from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD 2010) ranked stroke as the second most common cause of death (Lozano et al., 2012), and the third most common cause of disability-adjusted life-years (DALYs) worldwide in 2010 (Murray et al., 2012). Even though the age-standardised incidence of stroke is decreasing in high-income countries, it is still increasing in low- and middle-income countries (Feigin et al., 2014; Yusuf, Reddy, Ounpuu, & Anand, 2001).

Improved primary prevention, and improved acute stroke treatment over the last years have given milder strokes and reduced mortality (Feigin et al., 2014; Meschia et al., 2014; Mijajlovic et al., 2017). In addition, we currently see a change in population demographics, with increased life expectancy and increased amount of elderly in the population that will potentially suffer from a stroke (Helsetilsyn, 1999; Mijajlovic et al., 2017). Hence, the absolute number of people having a stroke every year, stroke survivors, related deaths, and the overall global burden of stroke (DALYs lost) are therefore great and increasing (Feigin et al., 2014).

In Norway, about 12 000 people suffer from stroke every year (Fjærtoft et al., 2017). The incidence is stable, but in line with the global trends, the amount of elderly in the population is increasing, and the absolute number of strokes will most likely increase in Norway as well (Ellekjær & Selmer, 2007; Helsetilsyn, 1999). To reduce the burden of stroke to the Norwegian health system, an improvement in the health service and treatment for these patients are necessary. The Norwegian national guidelines for treatment and rehabilitation recommend all stroke patients to have acute treatment and rehabilitation in stroke units (Helsedirektoratet, 2010). The changes in clinical practice, and the lack of studies on long-term outcome for these patients, emphasize the importance of future studies. The research carried out in this field should be as accurate as possible, and should be able to be generalized to the whole population.

1.2 The burden of dementia

Dementia is described as a silent epidemic, with a duplicate in prevalence for every 20 years (Wortmann & Acosta, 2009). In 2010 the estimated prevalence of Alzheimer's disease or other dementias worldwide was 35.6 million people (Wortmann & Acosta, 2009). Because of the rising prevalence, and lack of effective curative treatment options, dementia is a major public health concern (Brookmeyer, Gray, & Kawas, 1998; Ritchie, Terrera, & Quinn, 2015). Around one in three people will develop stroke, dementia or both, and the incidence of both diseases rises exponentially with age (Mijajlovic et al., 2017; Seshadri et al., 2006). Stroke is a risk factor for dementia, and dementia predisposes to stroke. They also share many of the same risk factors (Appelros, Nydevik, & Viitanen, 2003; Zhu, Fratiglioni, Guo, Winblad, & Viitanen, 2000). Prevalence of dementia in subjects with a history of stroke is comparable with that seen in subjects 10 years older without a history of stroke (De Ronchi et al., 2007). This increase in prevalence cannot be explained by demographic or cardiovascular risk factors alone, or by cognitive impairment prior to the stroke (De Ronchi et al., 2007).

Predictors for post stroke dementia (PSD) are higher age, cognitive decline prior to the stroke, premorbid disability, previous stroke, diabetes mellitus, atrial fibrillation, cerebral atrophy and white matter disease (Henon, Pasquier, & Leys, 2006; Pendlebury, 2012). Characteristics of the stroke are also of importance for development of PSD (e. g. left hemisphere stroke, dysphasia, stroke severity, cortical vs. brainstem or lacunar infarcts, infarct volume, and the presence of multiple strokes separated in space and time, like recurrent stroke) (Henon et al., 2006; Pendlebury, 2012; Pendlebury & Rothwell, 2009). Certain complications of stroke including incontinence, early seizures, acute confusion, hypoxic ischemic episodes and hypotension are also strongly associated with PSD (Pendlebury, 2012). An improvement in primary prophylaxis and acute treatment of stroke is important, because it will lead to milder strokes with less complications, and reduce the risk of PSD. One of the strongest risk factors for PSD is recurrent stroke, and efficient secondary prophylaxis is for that reason very important (Pendlebury & Rothwell, 2009). Cognitive impairment after stroke is also associated with increased mortality rate, institutionalization, disability, dependency, delayed discharge and higher costs of care. For that reason, a stroke will not only affect each individual, but also the relatives, the health service and the society (Barba et al., 2002; Desmond, Moroney, Sano, & Stern, 2002; Pasquini, Leys, Rousseaux, Pasquier, & Henon, 2007). The prevention of PSD is for that reason very important.

A systematic review by Pendlebury and Rothwell has been looking at prevalence and risk factors of pre-stroke and post-stroke dementia (Pendlebury & Rothwell, 2009). They identified 22 hospital-based and 8 population-based cohorts described in 73 papers. After study methods and case mix were taken into account, they reported an estimate of dementia prevalence with about 10% of stroke patients suffering from dementia prior to their first stroke, 10% developing PSD during the first year after their first ever stroke, while more than 30% developed PSD after recurrent stroke (Pendlebury & Rothwell, 2009). The risk was highest immediate after the event, however, the findings indicated a long-term increased risk of PSD about 2-4 times as compared to the non-stroke population (Henon et al., 2006; Pendlebury, 2012; Pendlebury & Rothwell, 2009; Savva & Stephan, 2010). In addition, mild cognitive impairment (MCI) is at least as frequent as PSD (Brainin et al., 2015). A Norwegian study published in 2011 on first ever stroke showed PSD in about 20% of patients during the first year, and MCI in about 40% (Ihle-Hansen et al., 2011). Most likely, the prevalence of PSD and MCI is higher than first presumed (Delavaran et al., 2017; Desmond, Bagiella, Moroney, & Stern, 1998; Pendlebury, Chen, Bull, et al., 2015). The need to investigate this further is great.

1.3 Validity and reliability

In clinical research, reliability refers to the consistency and stability of research measurements. Measurements that are highly reliable are accurate, and the results remain the same after a number of repeated measurements, under precisely the same conditions (Sijtsma & van der Ark, 2015). Validity on the other hand refers to whether the findings have any value in the real world, and if the assertions made in a research study are likely to be true (Supino, 2012). There are two different types of validity that need to be considered, internal and external validity (Supino, 2012). The internal validity refers to the possibility that the findings in a study can be explained through the hypothesis. High internal validity means that the study design effectively control for competing explanations, which means there is small amount of bias and error of measurement (Supino, 2012). Reliability is an important presumption to good internal validity. The external validity in a study refers to the generalizability, which means whether the study findings can be extrapolated to subjects, contexts, and times other than those where the findings were obtained (Supino, 2012). Internal validity is a presumption for external validity. The ability to draw valid inferences from data is a very important aspect of research, and the basis for understanding the new knowledge represented by research results (Supino, 2012).

1.4 Selection bias

To increase validity, effectively control for bias is important (Supino, 2012). If the selection of individuals, groups or data for analysis is not entirely random, and the sample obtained is not representative of the population intended to be analyzed, it is called selection bias. Selection bias may also occur in the process of including participants into the study (Weuve et al., 2015), or when it comes to attrition, if the group of patients dropping out between follow-ups is not random. In addition, bias due to mortality may occur if the patients who died prior to baseline inclusion had a higher amount of PSD than the included patients (Weuve et al., 2015).

1.4.1 Factors associated with selection bias

A limitation in many studies of stroke and transient ischemic attack (TIA) is that even though the goal is to include all patients, some groups will unintentionally fall out of the study (Pendlebury, Chen, Bull, et al., 2015). Many studies on dementia after stroke have strict inclusion criteria, often excluding patients with poor general health condition, dysphasia, poor vision and hearing impairment, but also older age, comorbidity, dependency or a combination of these (Delavaran et al., 2017; Pendlebury, Chen, Bull, et al., 2015). In order to improve generalizability, the inclusion criteria should be as wide as possible (Supino, 2012). Even though some studies are aiming to make the inclusion criteria wider, there will still be problems, both for ethical and practical reasons, as it often will feel unethical to include patients with severe stroke and short lifetime expectancy into a study. Furthermore, inclusion into clinical studies often requires the patient to meet at several follow-ups, which can be challenging for the oldest and most frail patients. In addition, the patients are often required to complete both physical and cognitive tests. Some patient groups will for that reason be more difficult to assess. If the risk factors for the condition we want to investigate are related to the process of inclusion into the study, the risk of selection bias will increase (Weuve et al., 2015). That is, if patients with pre-stroke cognitive impairment or poor health for other reasons are at higher risk of developing PSD, they are more likely to be excluded from studies, which may give an underestimation of PSD. There is still need for more research on characteristics of patients being excluded, and to what degree this contributes to an underestimation of PSD (Weuve et al., 2015).

Several previous studies have been investigating methodological challenges in stroke and TIA-associated dementia, and the impact selection bias at baseline may have on the result.

The groups that often were excluded from studies were older patients (especially > 80 years old) (Paganini-Hill, Ducey, & Hawk, 2013; Pendlebury, Chen, Bull, et al., 2015), patients with impaired function prior to the stroke (modified Rankin Scale score > 3) (Pendlebury, Chen, Bull, et al., 2015), patients with comorbidities, especially dementia (Pendlebury, Chen, Bull, et al., 2015; Ritchie et al., 2015), and patients suffering from severe stroke (Pendlebury, Chen, Bull, et al., 2015). Other factors making assessment difficult seemed to include impaired vision, hemiparesis (especially if dominant arm is affected) and problems with the language (e.g. dysphasia) (Pendlebury, Chen, Bull, et al., 2015). These are also factors associated with an increased risk of developing PSD (Henon et al., 2006; Pendlebury, 2012). In a study by Pendlebury et al. (2015) the surviving patients not included in the studies were investigated, and a higher incidence of PSD was shown in these patients, especially among patients > 80 years, with impaired pre-stroke function (mRS > 3). A higher prevalence of PSD was also found in patients with comorbidities or/and dysphasia (Pendlebury, Chen, Bull, et al., 2015). Therefore, previous studies may have given an underestimation of stroke-associated dementia (Desmond et al., 1998; Pendlebury, Chen, Bull, et al., 2015), and interventions introduced to prevent PSD will most probably be ineffective on population level, because they are based on results from this "highly selected groups".

1.4.2 Bias due to attrition

Bias due to attrition can be a huge challenge in dementia research, since the patients can only be diagnosed with dementia at occasional follow-ups. If the patient were free of dementia at the last clinical assessment, PSD status will remain unknown. This can potentially result in underestimation of PSD, because these patients are listed as free of dementia (Weuve et al., 2015). Several studies have been investigating reasons for study attrition, both looking at early patient attrition (Desmond et al., 1998), and attrition up to 5 years after stroke (Pendlebury, Chen, Welch, et al., 2015). The two main independent factors related to increased attrition were older age and cognitive impairment (Chatfield, Brayne, & Matthews, 2005; Desmond et al., 1998; Pendlebury, Chen, Welch, et al., 2015; Weuve et al., 2015). Other factors associated with unavailability for follow-up included very ill or frail patients, patients with comorbid medical disorders, major dominant hemisphere syndrome, left and right hemisphere infarct locations and a history of recurrent stroke (Chatfield et al., 2005; Desmond et al., 1998; Pendlebury, Chen, Welch, et al., 2015). In addition, some patients were unavailable due to severe stroke, or due to early death (Desmond et al., 1998). The factors associated with loss to follow-up were similar to the risk factors of PSD. The research group

of Desmond et al. (1998) tested the patients who were lost to follow-up in their study, and found a significantly higher prevalence in of PSD the group not assessed. Exclusion of patients unavailable for clinical follow up will most likely reduce the measured rate of PSD (Desmond et al., 1998; Pendlebury, Chen, Welch, et al., 2015).

Factors associated with death prior to baseline inclusion or prior to follow-up were older age and cognitive impairment prior to the stroke (Chatfield et al., 2005; Desmond et al., 1998; Matthews, Chatfield, Freeman, McCracken, & Brayne, 2004; Pendlebury, Chen, Welch, et al., 2015).

1.4.3 How to reduce selection bias?

To increase validity of the results, future studies are recommended to offer alternatives to clinical assessment. Examples are phone calls with participants and/or their caregivers and home visits to be able to investigate the oldest and most frail patients, and to hand search primary care records in patients difficult to get in touch with (Paganini-Hill et al., 2013; Pendlebury, Chen, Welch, et al., 2015). In addition to try to minimize bias, future studies should also investigate attrition and selection, and take the findings into consideration when analysing the results, to avoid misleading results due to attrition and bias (Chatfield et al., 2005; Coley et al., 2008; Matthews et al., 2004). A minimum set of confounding factors should be considered, including age, education and baseline cognitive function. Attrition rates should always be evaluated (Coley et al., 2008). Future studies should also provide data on non-available patients together with risk factor-adjusted estimation of probability of dementia in those not assessed (Pendlebury, Chen, Welch, et al., 2015).

1.5 Nor-COAST

The Norwegian COgnitive impairment After STroke (Nor-COAST) study is a large national multicentre study on acute stroke, aiming to quantify and measure levels of cognitive impairments in a Norwegian general stroke cohort and to identify risk-profiles and factors associated with overall prognosis for early and late onset cognitive disorders following incident stroke. The hospitals participating in the study are St. Olavs hospital (the stroke unit and the neurological department), Ålesund hospital, Haukeland university hospital, Bærum hospital and Ullevål hospital.

Assessments were performed during the initial hospital stay with follow-ups at 3 and 18 months. The results from the Nor-COAST study will be taken into consideration when the researchers in the future will develop new guidelines on how to prevent and treat PSD and MCI, both nationally and internationally. For that reason, it is very important to consider if these results are representative for the whole Norwegian stroke population.

Therefore it is of great importance to investigate to which extent the Nor-COAST study suffers from selection bias. This can be done by comparing baseline data from Nor-COAST with corresponding data on patients not included from the Norwegian Stroke Registry.

1.6 The Norwegian Stroke Registry

The Norwegian Stroke Registry (NHR) is a national medical quality registry for stroke care. The aim is to improve the quality of health care for people with cardiovascular disease. The registry is part of the Norwegian Cardiovascular Disease Registry (NCDR) (Fjærtoft et al., 2017). NHR contains data on the patient's background prior to the stroke, treatment during hospital stay, and data on follow-up three months after hospital admittance. Annual reports are available, and contain quality indicators essential for evidence based treatment and care, and descriptive statistics on the Norwegian stroke population (Fjærtoft et al., 2017).
All stroke patients hospitalized within 28 days after onset of symptoms are included in NHR (Fjærtoft, Skogseth-Stephani, Mørch, & Indredavik, 2015). Reporting of patients is a legal obligation, and does not require the patients consent (Fjærtoft et al., 2017). NHR is the first Norwegian quality registry to fulfil the criteria of stadium 4, which is the highest level, with coverage of 84% of the patients in 2016 (Nilsen, 2017). Hence, the registry should be regarded as representative to the Norwegian stroke population.

By utilizing data from NHR we have a unique opportunity to compare baseline data from patients included with those not included in stroke studies, and thereby assess the possibility of selection bias.

1.7 Objectives

The aim of this student thesis was to investigate to what extent patients participating in the Nor-COAST study differs from the patients not participaing. Data from Nor-COAST will be compared with corresponding data from the NHR.

The following research question will be enlightened: When it comes to well-known baseline variables, are there differences between participants and non-participants in the Nor-COAST study?

The primary hypothesis was that participants in the Nor-COAST study were younger compared to non-participants. A secondary hypothesis was that the participants in the Nor-COAST study suffered from less severe strokes compared to non-participants.

2. Methods

2.1 Study design

In this study a descriptive, cross-sectional study design was used. Patients included in the Nor-COAST study represented the participants while patients admitted to the participating hospitals (as shown in Figure 1) registered in the Stroke Registry (NHR) represented the non-participants. Due to the quality check of data in NHR, only data from patients admitted to the participating hospitals between 5. May 2015 and 31. December 2016 was available for this assignment.

According to instructions given by the Regional Committee for Medical and Health Research Ethics (REK), the national identity numbers of all cases were handed over to a member of the NHR board who extracted the participants in Nor-COAST from the data-file at NHR. Subsequently, an anonymous file including data on the non-participants only, was returned to the project leader. The study was approved by REK-Nord (2015/171/REK north) and the Norwegian Institute of Public health.

Figure 1 shows the study design, with this assignment encircled with a black line.

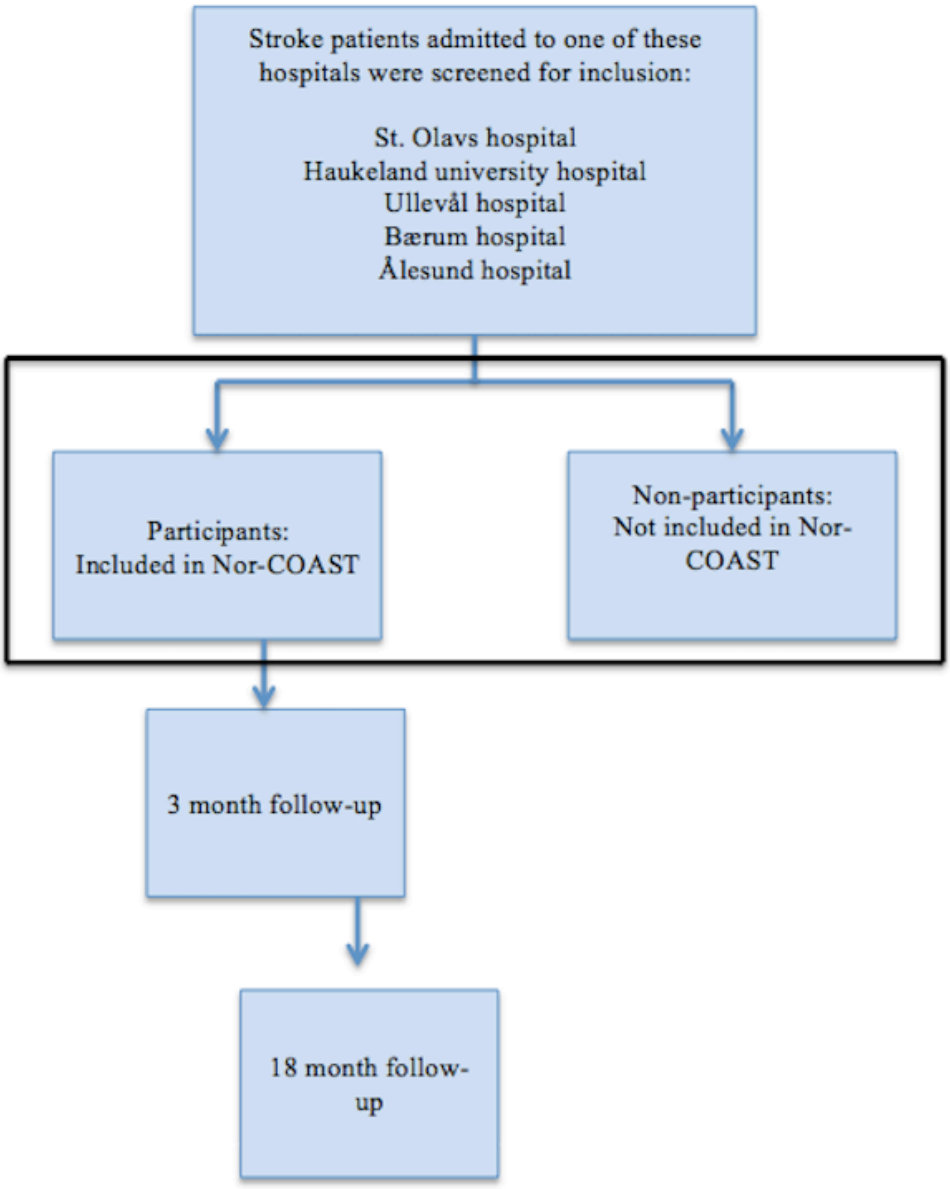

Figure 1. Study design.

2.2 Study participants

The inclusion criteria for participants in the Nor-COAST study were 1) diagnosis of stroke according to the established WHO criteria (WHO-MONICA, 1988), or with MRI findings compatible with acute infarction or intracerebral haemorrhage, 2) admitted to one of the 5 participating hospitals within one week after start of symptoms, 3) speak Norwegian, and 4) have a carer who was able to give supplementary information about cognition. Patients with expected lifetime less than 3 months were for ethical reasons excluded from the study.

The inclusion criteria for the non-participants recruited from NHR were patients admitted to one of the 5 participating hospitals, within the same period of time and not included in the Nor-COAST study.

2.3 Variables

The following variables were available in both datasets and were used to compare baseline characteristics between participants and non-participants:

- Age
- Gender
- Modified Rankin Scale (mRS) score were used to assess the level of disability prior to the stroke (van Swieten, Koudstaal, Visser, Schouten, & van Gijn, 1988). This is a commonly used scale for measuring the degree of disability or dependence in the daily activities of people who have suffered a stroke. The score ranges from 0 (indicating no symptoms at all), to 5 (which indicates severe disability, and the patient requires constant nursing care and attention), while a score of 6 means death (van Swieten et al., 1988). In this study, the mRS was merged into two categories, to distinguish between independent (score 0-2) and dependent (score 3-5) subjects.
- Stroke severity at admission and after 24 hours were assessed using the National Institutes of Health Stroke Scale (NIHSS) (Brott et al., 1989). This is a 15-item neurologic examination stroke scale, to quantify severity of neurological deficits e.g. hemiparesis, level of consciousness, aphasia etc. High score indicates severe stroke. The maximum possible score is 42, and the minimum score is 0. NIHSS categories were merged into mild stroke (score 0-4), moderate stroke (score 5-15), moderate to severe stroke (score 16-20) and severe stroke (score > 20) (Ellekjær, 2016).
- Housing conditions prior to the stroke was listed with the following categories: in their own residence (with or without community care), residential care home, nursing home and unknown. The categories were merged and dichotomised as subjects living in their own residence versus those living in institution/care home. The unknown category was maintained.
- Home situation was categorised into the categories: alone, together with someone, institution/nursing home and unknown. These categories were merged and dichotomised

into the following categories: alone versus institution/living together with someone. The unknown category was maintained.

- Side location of symptoms was categorised into right, left, bilateral, not relevant and unknown.
- Stroke diagnosis was categorised into cerebral infarction, haemorrhage or not classified.
- Previous cerebrovascular disease; stroke or TIA.
- Comorbidities
    - Previous heart attack (yes or no).
    - Atrial fibrillation, confirmed on ECG at present hospital stay or prior to the stroke (including paroxysmal atrial fibrillation) (yes or no).
    - Diabetes, diagnosed at present hospital stay or prior to the stroke (yes or no).
- Smoking habits prior to the stroke were initially categorised into the following categories: never, smoker, ex-smoker (non-smoking > 1 month) or unknown. Only the smokers versus those never smoking were analysed. Due to uncertainty about the data quality of the ex-smokers, these were categorized as "missing" together with those with unknown smoking status.

The variables used in this study were recoded and given equal names, then they could be compared in our analyses. Previous names and categories, and corresponding new name and category, are listed in table 1 (attached). The two questionnaires used in the Nor-COAST study and the NHR are also attached.

2.4 Power calculation

Patients included in the Nor-COAST study were expected to be in average 2 years younger than patients who not were included. In the light of data from the NHR and previous studies at the stroke unit at St. Olavs Hospital (Ellekjaer et al., 2016; Hokstad et al., 2015), an average age in the participating group was estimated to be 72.4 years, and in the non-participating group 74.2 years. The standard deviation was presumed to be 11.2 in both groups. With a strength of 80%, and a p-value at 0.05, at least 607 participants will be required in each group.

2.5 Ethics

In this study, patients with acute cerebral stroke were included, which leads to some important ethical considerations. These patients are newly diagnosed with a severe disease. Many of the

patients are also old and in poor health condition, and some may have poor prognosis and short life expectancy. Some participants may be defeated if they don't manage the tests that they previously would have managed, or if they have to give up because they are exhausted. To meet some of these challenges, it is important to take breaks, and try to make the testing situation a positive experience.

There are also some positive side effects of being included in this study. The patients and relatives will get a lot of information on the patient's cognitive and physical health condition after the stroke, and any possible irregular findings will be closely followed up. No assessments will bring along any risk for the patient, and the project will give a lot of valuable information, which will be useful for this patient group in the future.

In this study, the data from the patients not included were collected from the NHR. The dataset also contains information on patients who have refused to participate in the Nor-COAST study. However, the data material was anonymized to comply with the Norwegian legislation on research ethics.

2.6 Statistical analysis

In this study, all statistical calculations were performed using IBM SPSS Statistics version 24. Baseline characteristics were compared between the participants and the non-participants, both for all hospitals in total, and for each hospital isolated. For all nominal variables, number of patients and percent (of total number of patients) in the different categories were calculated by using crosstabs. To analyse the differences between groups for nominal variables, Pearson Chi-Square test was used. For all continuous variables, the mean value and standard deviations were calculated. To analyse the differences between groups, the independent-samples T-test were used. P-values $< 0,05$ were considered statistical significant.

3. Results

Out of the 818 patients included from May 5th, 2015, until March 31st, 2017 in the Nor-COAST study, 739 were included by the end of December 2016 and included in the present study accordingly. One patient resigned from the study before data collection, and was for that reason taken out of our study. The remaining number of patients included from Nor-COAST was 738 (figure 2).

The non-participating group consisted of 1516 patients from the Norwegian Stroke Register (figure 2). In total, 2254 patients were included in this study.

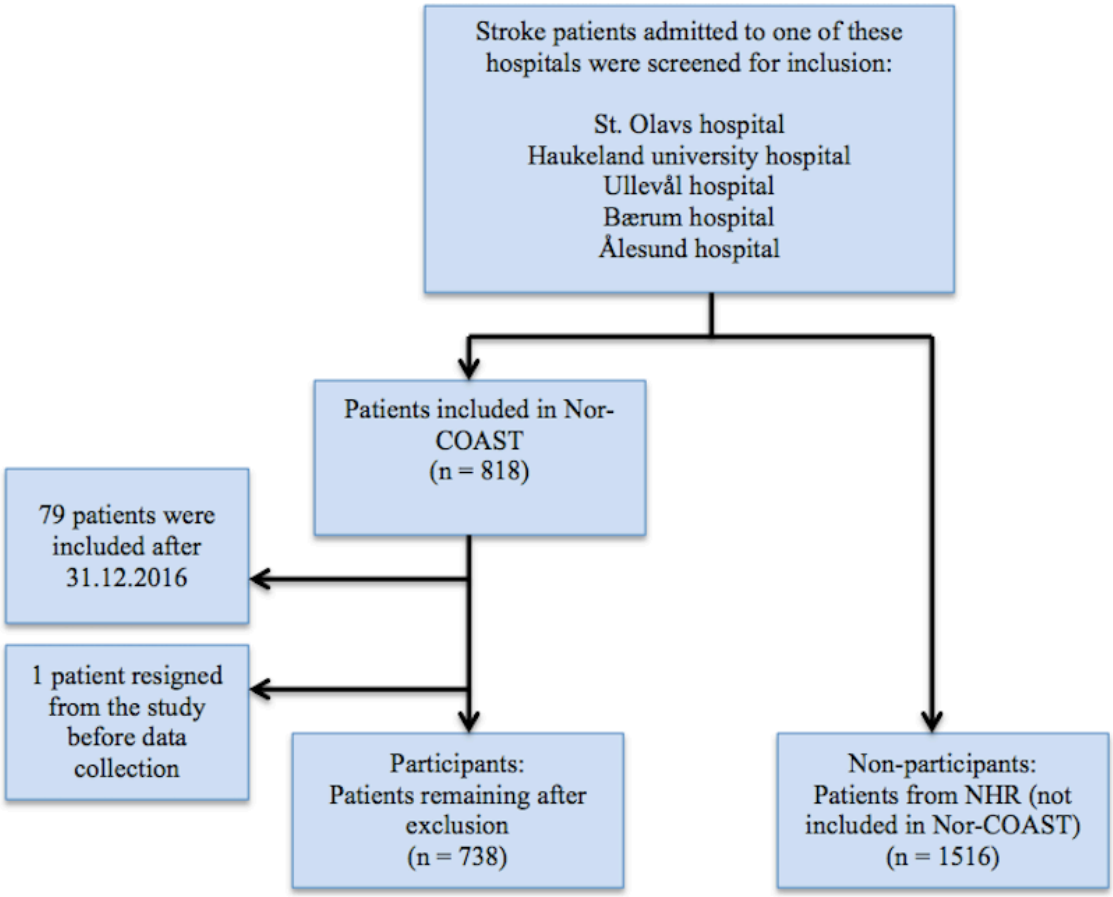

Figure 2. The patients included in this study.

The number of patients from each hospital and the percentage of total number of patients included in the two respective groups are presented in table 2. The last column shows proportion of stroke patients included in the Nor-COAST study (participation rates) from each of the participating hospitals.

Table 2. Hospital name and proportion of patients. Values are n (%).

Hospital	NHR (n=1516)	Nor-COAST (n=738)	Total (n=2254)	Proportion of stroke patients included in Nor-COAST
St. Olavs Hospital	555 (36.6)	352 (48.8)	907 (40.3)	352/907 (38.8)
Haukeland university hospital	403 (26.6)	142 (19.4)	545 (24.2)	142/545 (26.1)
Ullevål hospital	271 (17.9)	78 (10.7)	349 (15.5)	78/349 (22.3)
Bærum hospital	248 (16.4)	143 (19.5)	391 (17.4)	143/391 (36.6)
Ålesund hospital	39 (2.6)	17 (2.3)	56 (2.5)	17/56 (30.4)

3.1 Results for all hospitals in total

Comparisons of baseline characteristics between participants and non-participants from all hospitals in total are presented in table 3. Our findings show that a higher amount of the participants in the Nor-COAST study were classified with "mild stroke" compared to the patients not included, and they also had a lower mean NIHSS score (4.6 (SD = 6.0) compared to 7.2 (SD = 8.5)). The participants tended to have a lower modified Rankin Scale (mRS) score prior to the stroke than the non-participants (650 subjects (86.3%) compared to 1167 subjects (78.1%) of the non-participants had score 0-2, which is considered the independent group). Furthermore, the participants were more likely to still live in their own residence, rather than a residential care home or nursing home. There were a higher number of patients with unclassified diagnosis, and a smaller number of patients with the stroke diagnosis cerebral haemorrhages in the participating group. Also, fewer of the participants had experienced a previous cerebral stroke. The study participants had a lower prevalence of atrial fibrillation, compared to the non-participants.

When looking at all hospitals in total, mean age among participants were close to the mean age among non-participants, and the differences were not considered significant.

Table 3. Results for all hospitals in total.

Variables	Non-participants from NHR (n = 1516)	Participants from Nor-COAST (n = 738)	P-value*
Age, mean (SD)	74.0 (14.6)	73.8 (11.8)	0.665**
Gender, n (%)			
Female:	716 (47.2)	337 (46.0)	0.596
Male:	800 (52.8)	395 (54.0)	
Modified Rankin Scale prior to stroke[1], n (%)			
0-2:	1167 (78.1)	630 (86.3)	< 0.001
3-5:	327 (21.9)	100 (13.7)	
Housing conditions prior to stroke, n (%)			
In their own residence:	1343 (88.6)	715 (97.7)	< 0.001
Institution/care home:	167 (11.0)	17 (2.3)	
Unknown:	6 (0.4)	0 (0.0)	
Side location of symptoms[2], n (%)			
Right:	590 (38.9)	292 (40.1)	0.093
Left:	604 (29.8)	314 (43.1)	
Bilateral:	64 (4.2)	24 (3.3)	
Not relevant***:	196 (12.9)	82 (11.2)	
Unknown:	62 (4.1)	17 (2.3)	
Stroke diagnosis[3], n (%)			
Haemorrhage:	236 (15.6)	76 (10.5)	< 0.001
Infarction:	1269 (83.7)	587 (81.3)	
Unclassified:	11 (0.7)	59 (8.2)	
NIHSS score at admission[4], mean (SD)	7.2 (8.5)	4.6 (6.0)	< 0.001**
NIHSS score at admission[4], divided into categories, n (%)			
Mild stroke (0-4):	678 (55.5)	487 (69.3)	< 0.001
Moderate stroke (5-15):	347 (28.4)	164 (23.3)	
Moderate to severe stroke (16-20):	80 (6.5)	33 (4.7)	
Severe stroke (> 20):	117 (9.6)	19 (2.7)	
Previous cerebrovascular disease, n (%)			
Cerebral stroke:	350 (23.1)	140 (19.1)	0.038
TIA[5]:	144 (9.5)	75 (10.4)	0.157
Comorbidities, n (%)			
Previous heart attack:	216 (14.2)	95 (13.0)	0.220
Atrial fibrillation:	407 (26.8)	128 (17.5)	< 0.001
Diabetes[6]:	231 (15.2)	118 (16.1)	0.161
Smoke status prior to the stroke[7], n (%)			
Never:	588 (69.8)	313 (70.7)	0.760
Smoker:	254 (30.2)	130 (29.3)	

*Pearson chi-square test unless stated otherwise, **Independent-samples T-test, ***Denotes no significant side affected.

1) n=1494 and n=736 in the non-participating and the participating group respectively
2) n=735 in the participating group
3) n=728 in the participating group
4) n=1222 and n=709 in the non-participating and the participating group respectively
5) n=727 in the participating group
6) n=737 in the participating group
7) n=842 and n=443 in the non-participating and the participating group respectively

3.2 Results for each hospital isolated

When comparing baseline characteristics between the two groups for each hospital at a time, the main finding was that the results were in line with the results from all hospitals in total.

3.2.1 St. Olavs Hospital

The results for St. Olavs hospital are shown in table 4. As for all hospitals in total, the NIHSS score was lower among participants from St. Olavs hospital, compared to the non-participating group, and a higher amount of the participants had a "mild stroke". The results also showed that the participants were more likely to live in their own residence, and they had a lower prevalence of atrial fibrillation. Among the participants from St. Olavs, there was a high amount of unclassified stroke diagnoses. As distinct from all hospitals in total, the results from St. Olavs Hospital showed significant differences in pre-stroke mRS scores between the two groups, and a significantly higher mean age among the participants, compared to the non-participating group. Finally, the results showed a significant difference when it came to side location; with a higher number of patients with symptoms located to their left side among the participants in Nor-COAST.

Table 4. Results for St. Olavs hospital.

Category	NHR (n = 555)	Nor-COAST (n = 352)	P-value*
Age, mean (SD)	72.9 (13.4)	75.1 (10.7)	0.005**
Gender, n (%)			
Female:	252 (45.4)	165 (46.9)	0.665
Male:	303 (54.6)	187 (53.1)	
Modified Rankin Scale prior to stroke, n (%)			
0-2:	409 (73.8)	273 (78.0)	0.156
3-5:	145 (26.2)	77 (22.2)	
Housing conditions prior to stroke, n (%)			
In their own residence:	499 (89.9)	336 (95.5)	0.010
Institution/care home:	55 (9.9)	16 (4.5)	
Unknown:	1 (0.2)	0 (0.0)	
Side location of symptoms, n (%)			
Right:	238 (42.9)	146 (41.8)	0.031
Left:	208 (37.5)	160 (45.8)	
Bilateral:	28 (5.0)	12 (3.4)	
Not relevant***:	42 (7.6)	16 (4.6)	
Unknown:	39 (7.0)	15 (4.3)	
Stroke diagnosis, n (%)			
Haemorrhage:	91 (16.4)	43 (12.5)	< 0.001
Infarction:	459 (82.7)	253 (73.5)	
Unclassified:	5 (0.9)	48 (14.0)	
NIHSS score at admission, mean (SD)	9.3 (10.6)	5.2 (6.4)	< 0.001**
NIHSS score at admission, divided into categories, n (%)			
Mild stroke (0-4):	215 (50.0)	217 (65.2)	< 0.001
Moderate stroke (5-15):	111 (25.8)	85 (25.5)	
Moderate to severe stroke (16-20):	42 (9.8)	19 (5.7)	
Severe stroke (> 20):	62 (14.4)	12 (3.6)	
Previous cerebrovascular disease, n (%)			
Cerebral stroke:	120 (21.6)	75 (21.3)	0.849
TIA:	59 (10.6)	48 (13.6)	0.064
Comorbidities, n (%)			
Previous heart attack:	89 (16.0)	52 (14.8)	0.332
Atrial fibrillation:	142 (25.6)	66 (18.8)	0.002
Diabetes:	85 (15.3)	62 (17.6)	0.192
Smoke status prior to the stroke, n (%)			
Never:	219 (69.1)	146 (67.0)	0.606
Smoker:	98 (30.9)	72 (33.0)	

*Pearson chi-square test unless stated otherwise, **Independent-samples T-test, ***Denotes no significant side affected.

3.2.2 Haukeland university hospital

Results from Haukeland university hospital are presented in table 5. In line with the results from St. Olavs Hospital, participants from Haukeland also had a lower NIHSS score, and a higher amount of mild strokes compared to the group not included. 100.0% of the participants lived in their own residence, compared to 91.8% in the non-participating group, and the results also showed a lower prevalence of atrial fibrillation in the participating group.

Table 5. Results for Haukeland university hospital.

Category	NHR (n = 403)	Nor-COAST (n = 142)	P-value*
Age, mean (SD)	73.9 (15.3)	70.5 (12.7)	0.010**
Gender, n (%)			
Female:	187 (46.4)	58 (40.8)	0.252
Male:	216 (53.6)	84 (59.2)	
Modified Rankin Scale prior to stroke, n (%)			
0-2:	300 (74.6)	133 (93.7)	< 0.001
3-5:	102 (25.4)	9 (6.3)	
Housing conditions prior to stroke, n (%)			
In their own residence:	370 (91.8)	142 (100.0)	0.002
Institution/care home:	31 (7.7)	0 (0.0)	
Unknown:	2 (0.5)	0 (0.0)	
Side location of symptoms, n (%)			
Right:	151 (37.5)	55 (38.7)	0.005
Left:	184 (45.7)	57 (40.1)	
Bilateral:	21 (5.2)	1 (0.7)	
Not relevant***:	43 (10.7)	29 (20.4)	
Unknown:	4 (1.0)	0 (0.0)	
Stroke diagnosis, n (%)			
Haemorrhage:	52 (12.9)	10 (7.0)	0.093
Infarction:	348 (86.4)	132 (93.0)	
Unclassified:	3 (0.7)	0 (0.0)	
NIHSS score at admission, mean (SD)	7.2 (7.3)	3.4 (4.2)	< 0.001**
NIHSS score at admission, divided into categories, n (%)			
Mild stroke (0-4):	207 (54.2)	109 (76.8)	< 0.001
Moderate stroke (5-15):	115 (30.1)	30 (21.1)	
Moderate to severe stroke (16-20):	24 (6.3)	2 (1.4)	
Severe stroke (> 20):	36 (9.4)	1 (0.7)	
Previous cerebrovascular disease, n (%)			
Cerebral stroke:	91 (22.6)	24 (16.9)	0.092
TIA:	30 (7.4)	10 (7.0)	0.239
Comorbidities, n (%)			
Previous heart attack:	65 (16.1)	18 (12.7)	0.153
Atrial fibrillation:	126 (31.3)	21 (14.8)	0.001
Diabetes:	63 (15.6)	21 (14.8)	0.812
Smoke status prior to the stroke, n (%)			
Never:	124 (58.2)	54 (65.1)	0.280
Smoker:	89 (41.8)	29 (34.9)	

*Pearson chi-square test unless stated otherwise, **Independent-samples T-test, ***Denotes no significant side affected.

Like for all hospitals in total, we found a lower pre-stroke mRS score among study participants. As opposed to St. Olavs hospital, we found a significantly lower mean age among study participants (70.5 compared to 73.9 in the control group), and the results showed a higher number of participants with side location “not relevant” compared to the patients not included in Nor-COAST.

3.2.4 Ullevål hospital

Results for Ullevål hospital are shown in table 6. At this hospital, no significant differences in pre-stroke mRS score or NIHSS score at admission were found. However, we found a significantly higher mean age among participants in Nor-COAST compared to the non-participating group (78.6 years compared to 72.4 years). 100.0% of the participants lived at home, compared to 85.2% in the non-participating group. In line with the results from St. Olavs hospital, the participants were more likely to have symptoms located to their left side of the body. Also, there was a lower prevalence of cerebral haemorrhage among participants, and a higher amount of unclassified stroke diagnoses.

Table 6. Results for Ullevål hospital.

Category	NHR (n = 271)	Nor-COAST (n = 78)	P-value*
Age, mean (SD)	72.4 (15.7)	78.6 (7.9)	< 0.001**
Gender, n (%)			
Female:	120 (44.3)	39 (50.0)	0.371
Male:	151 (55.7)	39 (50.0)	
Modified Rankin Scale prior to stroke, n (%)			
0-2:	225 (89.6)	75 (96.2)	0.076
3-5:	26 (10.4)	3 (3.8)	
Housing conditions prior to stroke, n (%)			
In their own residence:	231 (85.2)	78 (100.0)	0.002
Institution/care home:	37 (13.7)	0 (0.0)	
Unknown:	3 (1.1)	0 (0.0)	
Side location of symptoms, n (%)			
Right:	98 (36.2)	27 (34.6)	0.042
Left:	95 (35.1)	35 (44.9)	
Bilateral:	9 (3.3)	6 (7.7)	
Not relevant***:	57 (21.0)	10 (12.8)	
Unknown:	12 (4.4)	0 (0.0)	
Stroke diagnosis, n (%)			
Haemorrhage:	43 (15.9)	5 (6.4)	< 0.001
Infarction:	228 (84.1)	68 (87.2)	
Unclassified:	0 (0.0)	5 (6.4)	
NIHSS score at admission, mean (SD)	4.1 (5.0)	3.5 (4.9)	0.381**
NIHSS score at admission, divided into categories, n (%)			
Mild stroke (0-4):	120 (66.7)	57 (76.0)	0.324
Moderate stroke (5-15):	52 (28.9)	14 (18.7)	
Moderate to severe stroke (16-20):	7 (3.9)	4 (5.3)	
Severe stroke (> 20):	1 (0.6)	0 (0.0)	
Previous cerebrovascular disease, n (%)			
Cerebral stroke:	64 (23.6)	17 (21.8)	0.168
TIA:	19 (7.0)	6 (9.0)	0.600
Comorbidities, n (%)			
Previous heart attack:	31 (11.4)	16 (20.5)	0.104
Atrial fibrillation:	58 (21.4)	15 (19.2)	0.365
Diabetes:	47 (17.3)	15 (19.5)	0.692
Smoke status prior to the stroke, n (%)			
Never:	90 (65.7)	31 (68.9)	0.694
Smoker:	47 (34.3)	14 (31.1)	

*Pearson chi-square test unless stated otherwise, **Independent-samples T-test, ***Denotes no significant side affected

3.2.5 Bærum hospital

Results for Bærum hospital are presented in table 7. The results showed that the participants in Nor-COAST had a lower pre-stroke mRS score compared to the group not included, however, no significant differences in NIHSS score at admission were found. The results showed a significantly higher amount of study participants living in their own residence (100.0% compared to 84.3% in the non-participating group). We also found a lower mean age among the participants (71.0 compared to 77.9 in the non-participating group).

Table 7. Results for Bærum hospital.

Category	NHR (n = 248)	Nor-COAST (n = 143)	P-value*
Age, mean (SD)	77.9 (14.5)	71.0 (13.7)	< 0.001**
Gender, n (%)			
Female:	133 (53.6)	69 (48.3)	0.305
Male:	115 (46.4)	74 (51.7)	
Modified Rankin Scale prior to stroke, n (%)			
0-2:	204 (82.3)	136 (95.1)	< 0.001
3-5:	44 (17.7)	7 (4.9)	
Housing conditions prior to stroke, n (%)			
In their own residence:	209 (84.3)	143 (100.0)	< 0.001
Institution/care home:	39 (15.7)	0 (0.0)	
Unknown:	0 (0.0)	0 (0.0)	
Side location of symptoms, n (%)			
Right:	88 (35.5)	58 (40.6)	0.867
Left:	105 (42.3)	54 (37.8)	
Bilateral:	4 (1.6)	3 (2.1)	
Not relevant***:	47 (19.0)	26 (18.2)	
Unknown:	4 (1.6)	2 (1.4)	
Stroke diagnosis, n (%)			
Haemorrhage:	43 (17.3)	17 (12.1)	0.213
Infarction:	202 (81.5)	120 (85.1)	
Unclassified:	3 (1.2)	4 (2.8)	
NIHSS score at admission, mean (SD)	5.9 (6.9)	4.7 (6.7)	0.128**
NIHSS score at admission, divided into categories, n (%)			
Mild stroke (0-4):	130 (59.1)	97 (69.3)	0.089
Moderate stroke (5-15):	66 (30.0)	31 (22.1)	
Moderate to severe stroke (16-20):	7 (3.2)	7 (5.0)	
Severe stroke (> 20):	17 (7.7)	5 (3.6)	
Previous cerebrovascular disease, n (%)			
Cerebral stroke:	61 (24.6)	22 (15.4)	0.072
TIA:	30 (12.1)	9 (6.3)	0.069
Comorbidities, n (%)			
Previous heart attack:	24 (9.7)	7 (4.9)	0.105
Atrial fibrillation:	70 (28.2)	25 (17.5)	0.056
Diabetes:	29 (11.7)	18 (12.6)	0.793
Smoke status prior to the stroke, n (%)			
Never:	133 (89.9)	76 (88.4)	0.722
Smoker:	15 (10.1)	10 (11.6)	

*Pearson chi-square test unless stated otherwise, **Independent-samples T-test, ***Denotes no significant side affected.

3.2.6 Ålesund hospital

None of the results for Ålesund hospital were considered statistically significant. Results for Ålesund hospital are shown in table 8.

Table 8. Results for Ålesund hospital.

Category	NHR (n = 39)	Nor-COAST (n = 17)	P-value*
Age, mean (SD)	78.1 (12.2)	74.2 (12.1)	0.276**
Gender, n (%)			
Female:	24 (61.5)	6 (35.3)	0.070
Male:	15 (38.5)	11 (64.7)	
Modified Rankin Scale prior to stroke, n (%)			
0-2:	29 (74.4)	13 (76.5)	0.867
3-5:	10 (25.6)	4 (23.5)	
Housing conditions prior to stroke, n (%)			
In their own residence:	34 (87.2)	16 (94.1)	0.440
Institution/care home:	5 (12.8)	1 (5.9)	
Unknown:	0 (0.0)	0 (0.0)	
Side location of symptoms, n (%)			
Right:	15 (38.5)	6 (35.3)	0.385
Left:	12 (30.8)	8 (47.1)	
Bilateral:	2 (5.1)	2 (11.8)	
Not relevant***:	7 (17.9)	1 (5.9)	
Unknown:	3 (7.7)	0 (0.0)	
Stroke diagnosis, n (%)			
Haemorrhage:	7 (17.9)	1 (5.9)	0.055
Infarction:	32 (82.1)	14 (82.4)	
Unclassified:	0 (0.0)	2 (11.8)	
NIHSS score at admission, mean (SD)	5.4 (7.9)	7.6 (9.4)	0.556**
NIHSS score at admission, divided into categories, n (%)			
Mild stroke (0-4):	6 (60.0)	7 (53.8)	0.839
Moderate stroke (5-15):	3 (30.0)	4 (30.8)	
Moderate to severe stroke (16-20):	0 (0.0)	1 (7.7)	
Severe stroke (> 20):	1 (10.0)	1 (7.7)	
Previous cerebrovascular disease, n (%)			
Cerebral stroke:	14 (35.9)	2 (11.8)	0.066
TIA:	6 (15.4)	2 (11.8)	0.363
Comorbidities, n (%)			
Previous heart attack:	7 (17.9)	2 (11.8)	0.124
Atrial fibrillation:	11 (28.2)	1 (5.9)	0.082
Diabetes:	7 (17.9)	2 (11.8)	0.562
Smoke status prior to the stroke, n (%)			
Never:	22 (81.5)	6 (54.5)	0.087
Smoker:	5 (18.5)	5 (45.5)	

*Pearson chi-square test unless stated otherwise, **Independent-samples T-test, ***Denotes no significant side affected.

4. Discussion

The main results from the present student thesis including more than 2200 patients with stroke from a defined population showed that patients included in the Nor-COAST study did not differ significantly according to age, but suffered from less severe strokes compared to the patients not included. Hence, the secondary hypothesis was confirmed while the primary hypothesis was not confirmed.

4.1 Discussion of results

Older age is a risk factor of severe stroke, pre stroke dementia and comorbidity (Appelros et al., 2003; Pendlebury, 2012; Ritchie et al., 2015), and previous studies show that older people for that reason often are unavailable for assessment (Chatfield et al., 2005; Desmond et al., 1998; Paganini-Hill et al., 2013; Pendlebury, Chen, Bull, et al., 2015; Ritchie et al., 2015). We therefore assumed that the participants in Nor-COAST would be younger than the non-participating group. When comparing participants and non-participants for all hospitals in total, no significant age differences were found. However, some age differences were found when comparing the two groups for each hospital at a time.

One of the main differences between the two groups were the severity of the stroke. The participants in Nor-COAST had on average 2.6 points lower NIHSS score compared to the non-participating group, and a higher amount of patients with mild strokes (69.3% compared to 55.5% in the control group). The annual report from NHR showed that 59.8% of the patients had mild strokes in 2016 (Fjærtoft et al., 2017). When comparing the patients from Nor-COAST to the numbers from the annual report, the differences were smaller than first assumed. Anyhow, the result indicates that patients with the most severe strokes have not been included in the Nor-COAST study. Because severe stroke is a risk factor of PSD (Henon et al., 2006; Pendlebury, 2012), there is high risk of underestimating PSD in the Nor-COAST study.

Patients included in the Nor-COAST study also tended to have a lower mRS score and a higher amount of people living in their own residence prior to the stroke. People living at home are in general in better health condition than those living in institutions, which implies younger age, less comorbidity and lower mRS score. The mRS score is a measurement on functional impairment (van Swieten et al., 1988), and may be heightened by cognitive or physical causes, or a combination of both. Previous research indicates that comorbidities prior

to stroke, cognitive decline and older age lead to more severe stroke, with worse outcome (Appelros et al., 2003; Pendlebury, 2012; Renoux et al., 2017). Severe stroke and cognitive decline are risk factors of PSD (Henon et al., 2006; Pendlebury, 2012), which means that patients with high mRS score are in a higher risk of developing PSD. The housing condition in it self is not necessarily a risk factor, but can give an indication of the patient's health condition. Exclusion of patients with high mRS score and patients living in institutions will most probably contribute to an increased risk of underestimating stroke related dementia. Among the participants from Nor-COAST, 86.3% were self-reliant (score 0-2) prior to the stroke, compared to 78.1% among the non-participants. Numbers from the annual report show that 85% of patients in the stroke registry were self-reliant prior to stroke (Fjærtoft et al., 2017). This indicates that the participants from Nor-COAST may not differ as much from the Norwegian stroke population as first assumed when it comes to mRS score prior to stroke.

When looking at comorbidities like atrial fibrillation and previous stroke, patients included in the Nor-COAST study had a lower prevalence of both conditions. Only 17.5% of participants were diagnosed with atrial fibrillation compared to 26.8% in the non-participating group. Further on, 19.1% of the participants had experienced a previous stroke, compared to 23.1% in the non-participating group. In the annual NHR report prevalence of atrial fibrillation among stroke patients was close to the prevalence in the non-participating group, from that it seems that the lower prevalence of atrial fibrillation among study participants is real. Recurrent stroke is a major risk factor of PSD (Henon et al., 2006; Pendlebury, 2012; Pendlebury & Rothwell, 2009). Atrial fibrillation is a condition seen in a higher prevalence among patients with poor health and older age (Krahn, Manfreda, Tate, Mathewson, & Cuddy, 1995). Atrial fibrillation is also a risk factor to stroke (Lip, 2014). Some studies indicate a higher risk of developing PSD if the patient has atrial fibrillation prior to the stroke (Barba et al., 2000; Henon et al., 2006; Pendlebury, 2012). At the same time, atrial fibrillation is a risk factor of severe and recurrent stroke, with multiple lesions and a worse outcome (Appelros et al., 2003; Pendlebury, 2012). These are also risk factors to PSD, so they might be confounding factors. Regardless, exclusion of patients with atrial fibrillation and previous stroke can potentially lead to bias.

Our findings show that a higher part of the patients with cerebral haemorrhage were excluded from the study, which may have ethical reasons, since these patients often are in worse health condition in the acute stage compared to those with cerebral infarction. Patients with

haemorrhage often have more severe stroke with poorer prognosis, compared to infarction (Gjerstad, 2016). The risk of developing dementia after stroke does not seem to be influenced by the stroke type (Barba et al., 2000; Henon et al., 2001), but the severity of the stroke can of course affect the outcome. The results in this student thesis show that 10.5% of the patients included in Nor-COAST had cerebral haemorrhage as stroke diagnosis, while 15.6% of the controls had cerebral haemorrhage. When comparing to the numbers from the annual report from NHR, 13.5% had cerebral haemorrhage, which may indicate that the differences were not as large as first assumed. Another important point is that the stroke diagnoses of the Nor-COAST participants were classified with the Oxford classification system, while the ICD-10 system was used in non-participants from NHR. This may have lead to a higher amount of unclassified stroke diagnoses in the Nor-COAST study, which also means that the numbers above should be interpreted with caution.

Even though there were differences between the two groups, many of the characteristics were the same in both participants and non-participants. The distribution of gender seemed to be equally distributed, with a slightly higher amount of men compared to women in both groups. The presence of well-known risk factors like diabetes mellitus, previous TIA and smoking habits were approximately the same in the two groups. In addition, the amount of participants with previous heart attack did not significantly differ from the patients in the non-participating group. Even though there were differences between the two groups at some of the hospitals, when looking at all hospitals in total there were not significant differences when it came to mean age and side location.

When interpreting the future results from the Nor-COAST study, it will be important to have these differences in baseline characteristics in mind.

4.2 Hospital differences

The two baseline variables that differed at some of the hospitals, and not in the total, were age and side location. At Haukeland and Bærum hospital, the mean age was significantly lower in the participating group, indicating a selection bias toward younger patients. However, at St. Olavs and Ullevål, we found the opposite, a higher mean age among study participants compared to the non-participants. There are several possible reasons for this result. At St. Olavs patients from both the neurological department and the stroke unit were included. All stroke patients under 60 years old are admitted to the neurological department, which means

that the stroke unit have a higher average age. There has been a higher recruitment to the Nor-COAST study from the stroke unit, compared to the neurological department, which may explain why St. Olavs had high mean age. At Ullevål, another study including stroke patients less than 70 years old with light symptoms took place at the same time. This may have lead to a higher mean age among stroke patients recruited to the Not-COAST study. In total, the average age was close to each other in both groups. Because increasing age is a risk factor of PSD (Henon et al., 2006; Pendlebury, 2012) the future results have to be interpreted with caution when looking at these respective hospitals.

At St. Olavs and Ullevål hospital, patients with symptoms on the right side of the body (i.e. left hemisphere stroke) tended to be excluded from the study. Typically symptoms associated with left hemisphere stroke are hemiparesis on right side of the body and dysphasia (both impressive and expressive), which can make testing situation challenging (Pendlebury, Chen, Bull, et al., 2015). Some studies indicate that left hemisphere stroke and dysphasia are associated with higher risk of PSD (Lin et al., 2003; Pendlebury, 2012; Pohjasvaara et al., 1998). Hence, exclusion of patients with left hemisphere stroke may lead to underestimation of PSD. However, when looking at all hospitals in total, there are no significant differences in side location between participants and non-participants.

When the future results from each hospital are going to be presented it will be important to have the differences in baseline characteristics for that particular hospital in mind.

4.3 Methodological aspects

The cognitive assessments in the Nor-COAST study consisted of a number of tests to investigate the patient's cognitive function after stroke. To obtain data, medical records, telephone interview or interview of the patient, relatives or health professionals were used. The assessment included a comprehensive questionnaire, several tests like the Montreal Cognitive Assessment (MoCA), trail-making tests, and physical tests. The assessment was estimated to last around 2 hours, which unquestionably can be challenging for many of the stroke patients. Even though there were offered alternatives to patients not able to complete the test, one can imagine that the process of inclusion into the study somehow was affected by an unintentional selection towards patients with a better health condition, who were more likely to finish the test.

Common causes of exclusion from studies are older age, impaired function, comorbidities, severe stroke, hemiparesis, dysphasia and cognitive impairment prior to the stroke (Paganini-Hill et al., 2013; Pendlebury, Chen, Bull, et al., 2015; Ritchie et al., 2015). In the Nor-COAST study, the following factors seemed to make the patients unavailable for assessment: severe stroke, impaired function prior to stroke, living in institutions prior to stroke, cerebral haemorrhage, atrial fibrillation and recurrent stroke. In addition, it may seem that patients with left hemisphere stroke and older age were excluded at some of the hospitals.

Patients with life expectancy < 3 months were excluded from the Nor-COAST study, which may have resulted in exclusion of stroke patients with poor health condition and severe stroke. This may have lead to an underestimation of PSD. On the other hand, these patients would most likely be lost to follow-up, and the diagnosis of PSD would remain unknown at the time of death.

At Haukeland hospital, a high amount of the patients had side location "not relevant", which may be caused by methodological reasons. In the operating manual, the category "not relevant" is defined as; "no side differences are found", which also in some cases can be interpreted as "unknown". Even though the researchers who have been working with the Nor-COAST study have used the same operating manual as the NHR, we don't know if the alternatives have been interpreted differently. For that reason, it is unknown whether there are real side location differences between the two groups at Haukeland.

The questionnaire used by NHR was slightly different from the questionnaire used by Nor-COAST. Although they contained mostly the same questions, some of the variables had different categories. The two respective questionnaires are attached.

In contrast to the NHR questionnaire, the Nor-COAST questionnaire was lacking an option for responding "no" on the items for previous diseases. The question was whether the patient has had previous cardiovascular/endocrine disease, with several diseases listed as alternatives. It's conceivable that the two different forms have been leading to different interpretations. If the box was empty (not marked with a cross) there is difficult to say whether the answer is "no", "unknown" or if the examiner had just forgotten to mark the box with a cross. All of these alternatives were defined as "no" in this study, which may lead to an underestimation of previous diseases among the participants.

In contrast to the NHR questionnaire, the Nor-COAST questionnaire was lacking the options "yes" and "no" on the item, previous cerebral stroke/TIA. The question was whether the patient has had cerebrovascular disease, with several alternatives, like "infarction", "haemorrhage", "TIA" etc. Because TIA is not defined as stroke, patients with "previous cerebrovascular disease, but unknown whether it was infarction, haemorrhage or TIA" was categorized as "previous stroke unknown" in the present study. The findings in this study showed that the Nor-COAST participants had a lower prevalence of previous stroke, which may have been a result of underestimation of stroke cases due to this methodological challenge.

To prevent the results of being too comprehensive, we chose to exclude some of the variables of little importance to the result. That included NIHSS score 24 hours after admission, home situation prior to stroke, what type of previous stroke the patient has had and when the patient had a previous TIA.

Smoke status was categorised into "never" and "smoker". The reason why "ex-smoker" and "unknown" were excluded is that there was a high amount of unknown subjects in the stroke registry, leading to statistically significant results for all hospitals. When the categories "unknown" and "ex-smoker" were excluded, none of the hospitals had significant differences between the two groups. Hence, the differences found in the first analyses were most likely due to methodological bias.

In general, there was a small amount of missing values, which strengthen this study. However, about 15% of NIHSS scores were missing, which may lead to systematic error if the missing values mostly included the healthiest or the sickest patients. There are several potential reasons for the high number of missing values, e.g. that patients with vague symptoms may not be diagnosed with stroke right away, and for that reason NIHSS score is not completed. Missing values can be found in table 3.

There are some limitations to this study. One is that none of the variables from the stroke registry had data on cognitive ability prior to stroke or education level. Education level and cognitive ability prior to stroke is important to determine the patient's risk of developing PSD. Moreover, the questionnaire used in Nor-COAST differed from the ones used in NHR for some of the variables. In the process of interpreting the data from the two forms,

methodological bias may have occurred. However, the forms were alike in most of the variables used, and the same operating manual was used. We presume the bias to be minimal. In a future study, some of the Nor-COAST variables should be validated against the corresponding variables from the stroke registry. Comparing the NHR data with the corresponding Nor-COAST data for patients included in the study only could do this.

The major strength of the Nor-COAST study is the high number of participants. Another strength is that the study material of the control group is collected from the Norwegian Stroke Registry (NHR). The register fulfils the criteria of the highest level of quality, and had a coverage of 84% in 2016 (Nilsen, 2017). In addition, the hospitals participating in this study had an even higher coverage than 84% (except for Haukeland hospital), which means the data material used in the study represent values closer to the Norwegian stroke population (Fjærtoft et al., 2017). Most of the variables in NHR have substantial to excellent reliability, and serve as valuable source of data for epidemiological, clinical and healthcare studies (T. Varmdal et al., 2016; Torunn Varmdal et al., 2015).

4.3.1 External validity

When interpreting the results from the present study, it is important to have in mind that the control group consists of patients from NHR, where data from the patients included in Nor-COAST were extracted. None of these groups should be regarded as the general stroke population. However, data from the annual report (2016) by NHR, with its coverage of 84%, were used to compare the results against the stroke population in whole (Fjærtoft et al., 2017). Nevertheless, in future research a third group representing the unselected Norwegian stroke population should be included.

4.4 Conclusion

The participants included in the Nor-COAST study did not differ significantly from those not included with respect to age, however the participants included in Nor-COAST seemed to be slightly healthier prior to the stroke, with a lower modified Ranking Scale score, and a smaller prevalence of atrial fibrillation and previous stroke. They also tended to have milder strokes, expressed by a lower mean NIHSS score among the study participants. At some of the hospitals, we could see age differences between participants and non-participants, and also differences when it came to side location of symptoms. In summary, these results indicate that selection bias most likely has occurred in the Nor-COAST study, increasing the risk of

underestimating post stroke dementia in this population. Hence, the future results have to be interpreted with these results in mind.

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Appendix 1. Variable names and categories

Variable name – NHR	Categories	Variable name – Nor-COAST	Categories	New variable name	Label	New categories
Innleggelses-tidspunkt	NA	nihss_1	NA	AdmissionDate	Date of admission	NA
Helseenhet	1. St. Olavs hospital 2. Haukeland university hospital 3. Ullevål 4. Bærum hospital 5. Ålesund hospital	Center	1. St. Olavs hospital 2. Haukeland university hospital 3. Ullevål 4. Bærum hospital 5. Ålesund hospital	Hospital	Hospital	1. St. Olavs Hospital 2. Haukeland University Hospital 3. Ullevål Hospital 4. Bærum Hospital 5. Ålesund Hospital
PatientAge	NA	bakgr_AGE	NA	PatientAge	Age	NA
PatientGender	0. Unknown 1. Male 2. Female	bakgr_13	1. Female 2. Male	PatientGender	Gender	1. Female 2. Male 9. Unknown
MRSPre	0. No symptoms 1. Not considerably impaired function 2. Slightly impaired function 3. Moderate impaired function 4. Severe impaired function 5. Very severe impaired function 6. Dead	funk_4	0. No symptoms at all 1. Not considerably impaired function, can perform daily activities as usual 2. Slightly impaired function, can not perform all activities as usual, but maintains daily functioning 3. Moderate impaired function, need some help, but can still walk alone 4. Severe impaired function, need help to walk and to take care of fundamental needs 5. Very severe impaired function, bed-ridden, and need continuous supervision and assistance	MRSPre	MRS score prior to the stroke	0-2: Independent 3-5: Dependent 99. Missing

BoligforholdPre	1. In their own residence, without community care 2. In their own residence, with community care 3. Residential care home, with continuous supervision 4. Nursing home 9. Unknown	bakgr_10	1. In their own residence, without community care 2. In their own residence, with community care 3. Residential care home 4. Nursing home 5. Unknown	Housing_conditions	Housing conditions prior to stroke	1. In their own residence 2. Residential care home/institution 9. Unknown	
BosituasjonPre	1. Alone 2. Living together with someone 3. Institution/ Nursing home 9. Unknown	bakgr_12	1. Alone 2. Living together with someone (e.g. spouse, partner, sibling, child) 3. Institution 4. Unknown	Home_situation	Home situation prior to stroke	1. Alone 2. Living together with someone/institution 9. Unknown	
Sidelokasjon	1. Right 2. Left 3. Bilateral 4. Not relevant 9. Unknown	stat_5	1. Right 2. Left 3. Bilateral 4. Not relevant 5. Unknown	Side_location	Side location of symptoms	1. Right 2. Left 3. Bilateral 4. Not relevant 9. Unknown	
Slagdiagnose	1. I61: Cerebral haemorrhage 2. I63: Cerebral infarction 3. I64: Unclassified	stat_12 (Oxford classification)	1. TACI 2. PACI 3. LACI 4. POCI 5. Haemorrhage 6. Unclassified	Stroke_diagnosis	Stroke diagnosis	1. Haemorrhage (NHR category 1 = Nor-COAST category 5) 2. Infarction (NHR category 2 = Nor-COAST category 1-4) 3. Unclassified (NHR category 3 = Nor-COAST category 6)	
NIHSSInnkomst	NA	nihss_3 – nihss_17 (these had to be added together to get the total score)	Item 1 to 15 on NIHSS	NIHSSAdmission	Total score of NIHSS at admission	NA	Merged categories: 0-4: Mild stroke 5-15: Moderate stroke 16-20: Moderate to severe stroke >20: Severe stroke

NIHSS24timer	NA	nihss_20 – nihss_34 (these had to be added together to get the total score)	Item 1 to 15 on NIHSS	NIHSS24hours	Total score of NIHSS after 24 hours	NA	Merged categories: 0-4: Mild stroke 5-15: Moderate stroke 16-20: Moderate to severe stroke >20: Severe stroke
TidlHjerneslag	1. Yes 2. No 9. Unknown	Previous cerebrovascular disease	1. No prior cerebrovascular disease (yes/no) 2. Prior cerebral infarction (yes/no) 3. Prior TIA (yes/no) 4. Prior cerebral haemorrhage (yes/no) 5. Prior cerebrovascular disease, but not known whether it is haemorrhage, infarction or TIA 6. Unknown	Pre_stroke	Previous cerebral stroke?	1. Yes (NHR category 1 = Nor-COAST category: "yes" on 2 and 4) 2. No (NHR category 2 = Nor-COAST category: "yes" on 1 and 3) 9. Unknown (NHR category 9 = Nor-COAST category: "yes" on 5* and 6)	
TidlHjerneslagType	1. Infarction 2. Haemorrhage 3. Unclassified 4. Both infarction and haemorrhage 9. Unknown -1: Missing (all cases with "No" or "Unknown" on "Previous cerebral stroke")	Previous cerebrovascular disease	1. No prior cerebrovascular disease (yes/no) 2. Prior cerebral infarction (yes/no) 3. Prior TIA (yes/no) 4. Prior cerebral haemorrhage (yes/no) 5. Prior cerebrovascular disease, but not known whether it is haemorrhage, infarction or TIA 6. Unknown	Pre_stroke_type	If previous stroke – what type?	1. Infarction (NHR category 1 = Nor-COAST category: "yes" on 2, "no" on 4) 2. Haemorrhage (NHR category 2 = Nor-COAST category: "yes on 4", "no" on 2) 3. Unclassified (NHR category 3 (no corresponding category in Nor-COAST)) 4. Both infarction and haemorrhage (NHR category 4 = Nor-COAST category: "yes" on both 2 and 4) 9. Unknown (NHR category 9 (no	

						corresponding category in Nor-COAST)) Missing: Nor-COAST category 1, 3, 5 and 6 = all cases with “No” or “unknown” on previous cerebral stroke
TidlTIA	1. Yes 2. No 9. Unknown	Previous TIA	1. No 2. Yes, within the last week 3. Yes, 1-4 weeks prior to the stroke 4. Yes, 4-12 weeks prior to the stroke 5. Yes, over 12 weeks prior to the stroke 6. Unknown	Pre_TIA	Previous TIA?	1. Yes (NHR category 1 = Nor-COAST category: “yes” on 2-5) 2. No (NHR category 2 = Nor-COAST category: “yes” on 1) 9. Unknown (NHR category 9 = Nor-COAST category: “yes” on 6)
TidlTIANaar	1. Within the last week 2. 1-4 weeks prior to the stroke 3. 4-12 weeks prior to the stroke 4. Over 12 weeks prior to the stroke -1: Missing (all cases with “No” or “Unknown” on “Previous TIA”)	Previous TIA	1. No 2. Yes, within the last week 3. Yes, 1-4 weeks prior to the stroke 4. Yes, 4-12 weeks prior to the stroke 5. Yes, over 12 weeks prior to the stroke 6. Unknown	Pre_TIA_when	If previous TIA – when?	1. Within the last week (NHR category 1 = Nor-COAST category 2) 2. 1-4 weeks prior to the stroke (NHR category 2 = Nor-COAST category 3) 3. 4-12 weeks prior to the stroke (NHR category 3 = Nor-COAST category 4) 4. Over 12 weeks prior to the stroke (NHR category 4 = Nor-COAST category 5) Missing: Nor-COAST category 1 and 6 = all cases with “No” or “Unknown” on Pre_TIA

TidlHjerteinfarkt	1. Yes 2. No 9. Unknown	sykd_4_1	Previous heart attack 1. Yes = Heart attack marked 2. No = Heart attack not marked 3. Unknown = Heart attack not marked AND Unknown marked	Pre_heart_attack	Previous heart attack	1. Yes 2. No 9. Unknown
Atrieflimmer	1. Yes 2. No 9. Unknown	sykd_4_3	Atrial fibrillation 1. Yes = Atrial fibrillation marked 2. No = Atrial fibrillation not marked 3. Unknown = atrial fibrillation not marked AND Unknown marked	Atrial_fibrillation	Atrial fibrillation confirmed on ECG, now or prior to the stroke	1. Yes 2. No 9. Unknown
PreDiabetes	1. Yes 2. No 9. Unknown	sykd_8_4	Diabetes 1. Yes = Diabetes marked 2. No/unknown/forgotten = Diabetes not marked (will be considered as “No” in this study)	PreDiabetes	Diabetes, recently diagnosed or prior to the stroke	1. Yes 2. No 9. Unknown
RoykerPre	0. Never 1. Smoker 2. Ex-smoker (non-smoking > 1 month) 9. Unknown	leve_4	0. Never 1. Smoker 2. Ex-smoker (non-smoking > 1 month) 3. Unknown	PreSmoker	Smoke status prior to the stroke	0. Never 1. Smoker
				NHR_NorCOAST	Is the case from NHR or Nor-COAST data set?	0. NHR 1. Nor-COAST

*Pre stroke: Category 5 from Nor-COAST is included in the category ”Unknown” because we don’t know whether it is a previous stroke or previous TIA.

Appendix 2. Nor-COAST questionnaire

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: 2 0

Tester:

Pasient-ID:

Metode for innhenting av data:

☐ Intervju av pasient ☐ Intervju av pårørende ☐ Intervju av helsepersonell ☐ Sykejournal ☐ Telefonintervju

Opplysninger ikke tilgjengelig:

BAKGRUNNSINFORMASJON

Tidspunkt for symptomdebut:
dag/måned/år/timer/minutter

2 0

Oppvåkningsslag

☐ Ja ☐ Nei ☐ Ukjent

Tidspunkt for innleggelse:
dag/måned/år/timer/minutter

2 0

Utskrivingsdato: *dag/måned/år*

2 0

Boligforhold før slaget:
dag/måned/år

☐ Egen bolig uten hjemmesykepleie
☐ Egen bolig med hjemmesykepleie
☐ Omsorgsbolig
☐ Sykehjem
☐ Ukjent

Bosituasjon:

☐ Alene
☐ Sammen med noen (f.eks ektefelle/samboer, søsken, barn)
☐ Institusjon
☐ Ukjent

Sivil status:

☐ Gift eller samboer
☐ Enslig
☐ Enke eller enkemann
☐ Ukjent

Kjønn:

☐ Kvinne
☐ Mann

Dominant hånd:

☐ Høyre
☐ Venstre
☐ Ingen dominant side
☐ Ukjent

Etnisitet:

☐ Kaukasisk ☐ Afrikansk ☐ Asiatisk ☐ Latinamerikansk

Fødeland: _____

Utdanningsnivå:
(Kurs og internopplæring teller ikke som utdanning)

Formell skolegang (antall år)

Utdanning

☐ Ufaglært
☐ Fagbrev
☐ Høyskole/universitet

Yrke/tidligere yrke: _____

Har noen i familien symptomer som kan tyde på demens?

	Ja	Nei	Ukjent
a) Førstegangsslektning *(foreldre, søsken, barn)*	☐	☐	☐
b) Andregradsslektning *(besteforeldre, foreldres søsken, søskenbarn, halvsøsken)*	☐	☐	☐

Hva lever du av?

☐ Arbeidsinntekt ☐ Uførepensjon
☐ Sykepenger ☐ Ektefelles inntekt
☐ Alderspensjon ☐ Annet

1

LEVEVANER FØR SLAGET

1) Røykestatus:

☐ Aldri ☐ Røyker ☐ Eksrøyker (røykfri > 1 mnd.) ☐ Ukjent

2) Alkoholforbruk:

1 alkoholenhet = En flaske (33 cl) pils på 4,5 vol % = Et lite glass vin (12,5 cl) på 12 vol % = Et enda mindre glass sterkvin (7,5 cl) 20 vol % = Et svært lite glass brennevin (4 cl) 40 vol %

Glassene rommer ofte mer. Skal du telle antall alkoholenheter, så vurder også størrelsene på glassene: En halvliter øl = 1,5 enhet alkohol, et stort glass vin (17,5 cl) = 1,5 enhet alkohol

Hvor mange enheter øl, vin eller brennevin drikker du vanligvis i løpet av 2 uker? (Regn ikke med lettøl) (Sett 0 hvis du ikke drikker alkohol)

	øl	vin	brennevin
Antall enheter	☐☐	☐☐	☐☐

Hvor ofte drikker du 5 enheter eller mer av øl, vin eller brennevin ved samme anledning?

☐ Aldri ☐ Månedlig ☐ Ukentlig ☐ Daglig

3) Kosthold før slaget

Tar du omega-3 eller tran?

☐ Ja

☐ Nei

	Aldri	1-2 ganger pr uke	3-4 ganger pr uke	5-6 ganger pr uke	Daglig
Hvor ofte har du spist fisk de siste 6 måneder?	☐	☐	☐	☐	☐
Hvor ofte har du spist grønnsaker de siste 6 måneder?	☐	☐	☐	☐	☐

4) Fysisk aktivitet før slaget

Hvor ofte drev du mosjon/fysisk aktivitet før slaget?
Med mosjon mener vi at du f. eks. går tur, går på ski, svømmer eller driver med trening/idrett
(Ta et gjennomsnitt av de siste 6 måneder)

☐ Aldri
☐ Sjeldnere enn en gang i uka
☐ En gang i uka
☐ 2-3 ganger i uka
☐ Omtrent hver dag

Dersom du driver slik mosjon, så ofte som en eller flere ganger i uka; hvor hardt mosjonerer du? (Ta et gjennomsnitt)

☐ Tar det rolig uten å bli andpusten eller svett
☐ Tar det så hardt at jeg blir andpusten og svett
☐ Tar meg nesten helt ut

Hvor lenge holder du på hver gang?
(Ta et gjennomsnitt)

☐ Mindre enn 15 min ☐ 30 min - 1 time
☐ 15-29 min ☐ Mer enn 1 time

Har du vanligvis minst 30 minutter fysisk aktivitet daglig på arbeid og/eller i fritida?

☐ Ja ☐ Nei

FUNKSJON FØR SLAGET

Kunne du gå 200 meter før slaget?

☐ Ja ☐ Nei

Kunne du gå opp/ned trapp en etasje

☐ Ja ☐ Nei

Har du i løpet av de siste 12 månedene hatt noen fall, inkludert om du har snublet eller glidd, slik at du har mistet balansen og havnet i bakken eller på gulvet uten å ville det?
Uavhengig av årsak eller om du har skadet deg.

☐ Ja ☐ Nei

Hvis ja, hvor mange fall? ☐ Ett fall ☐ To fall ☐ Flere fall

Skader ved fall ☐ Ja ☐ Nei

Hvis ja, evt.kommentar:

Fatigue før slaget

Var du plaget med utmattelse før slaget?

☐ Ja ☐ Nei

Hvor lenge var du plaget med utmattelse?

☐ < 1 uke ☐ < 3-6 måneder ☐ Vet ikke
☐ < 3 måneder ☐ > 6 måneder

Har du hatt ufrivillig vekttap de siste 6 måneder før slaget? ☐ Ja ☐ Nei Hvis ja: antall kilogram ☐☐

Har du hatt urinlekkasje eller problemer med å tømme blæra før slaget?

☐ ingen problemer
☐ lekkasje
☐ problemer med å tømme blæra
☐ annet, f. eks. RIK eller permanent kateter

Hvis annet, spesifiser:

Hvor alvorlig har vannlatingsproblemet vært?

☐ Mildt
☐ Moderat
☐ Alvorlig

TIDLIGERE SYKDOMMER

Tidligere cerebrovaskulær sykdom

☐ Ingen tidligere cerebrovaskulær sykdom
☐ Hjerneinfarkt
☐ TIA
☐ Hjerneblødning
☐ Hatt cerebrovaskulær sykdom, men ukjent om blødning, infarkt eller TIA
☐ Usikker

Alder for første hjerneslag: (infarkt/blødning) ☐☐

Tidligere TIA

☐ Ingen tidligere TIA
☐ TIA i løpet av siste uke
☐ TIA 1-4 uker før slaget
☐ TIA 4-12 uker før slaget
☐ TIA over 12 uker før slaget
☐ Usikkert om pasienten har hatt TIA

Hjerte-karsykdom

☐ Ingen tidligere hjerte-karsykdom
☐ Hjerteinfarkt
☐ Angina pectoris
☐ Atrieflimmer bekreftet med EKG nå eller tidligere (også paroksystisk atrieflimmer)
☐ Hjertesvikt
☐ Gjennomgått karkirurgi (halskar, aorta, arterier i underekstremiteter)
☐ Hypertensjon før debut av slag
☐ Claudicatio intermittens (perifer vaskulær sykdom)
☐ Usikker

Hvis hjerteinfarkt eller angina: gjennomgått kardiologisk intervensjon?

☐ PCI (innsettelse av stent)
☐ CABG (koronar bypass)
☐ Nei
☐ Usikker

Hvis PCI eller CABG; måned og år for (første) kardiologiske intervensjon

☐☐☐☐☐☐

Hvis gjennomgått karkirurgi; måned og år for karkirurgisk intervensjon

☐☐☐☐☐☐

Thyroideasykdom ☐ Ja ☐ Nei

Vitamin B12-mangel, folatmangel ☐ Ja ☐ Nei

Hyperkolesterolemi før debut av slag (behandlet med kolesterolsenkende eller påvist totalkolesterol ≥ 6 mmol/l) ☐ Ja ☐ Nei

Diabetes mellitus (nyoppdaget eller tidligere diagnostisert) ☐ Ja ☐ Nei

Hvis diabetes mellitus: kjente komplikasjoner

☐ Ingen kjente komplikasjoner ☐ Øyne ☐ Nyrer ☐ Nevropati

Pasienten har betydelig nedsatt:

- ☐ Syn
- ☐ Hørsel
- ☐ Både syn og hørsel
- ☐ Ingen
- ☐ Usikker

Psykiatrisk lidelse

- ☐ Ingen behandlingstrengende psykiatrisk lidelse
- ☐ Tidligere behandlingstrengende depresjon
- ☐ Pågående behandlingstrengede depresjon
- ☐ Demens (også ikke behandlingstrengende)
- ☐ Annen behandlingstrengende psykisk sykdom
- ☐ Usikker

Andre sykdommer

- ☐ Ingen andre sykdommer
- ☐ Alvorlig kronisk lungesykdom
- ☐ Nyresykdom (er det påvist nedsatt nyrefunksjon?)
- ☐ Systemsykdom (revmatiske sykdommer, betennelsestilstander)
- ☐ Leversykdom
- ☐ Ulcus pepticum
- ☐ Paraplegi
- ☐ HIV
- ☐ Kreftsykdom med eller uten spredning
- ☐ Tidligere anmerket alkoholmisbruk i pasientjournal
- ☐ Tidligere opplysninger om narkotikabruk i journal
- ☐ Annen sykdom av betydning for funksjonsnivå
- ☐ Usikker

Hvis leversykdom, alvorlig? (cirrhose)

☐ Ja ☐ Nei

Hvis kreftsykdom, spredning?

☐ Ja ☐ Nei

Hvis narkotikabruk, hvilket/hvilke?

_____

Andre opplysninger

_____

STATUS I AKUTTFASEN

Sidelokalisasjon av symptomer

☐ Høyre ☐ Venstre ☐ Bilateralt

☐ Ikke relevant ☐ Ukjent

Trombolytisk behandling ☐ Ja ☐ Nei

Starttidspunkt for trombolyse (dag/måned/år/timer/minutter)

☐☐☐☐ 2 0 ☐☐ ☐☐☐☐

Klassifisering av slaget

Oxfordshire klassifikasjon

☐ TACI ☐ PACI ☐ LACI

☐ POCI ☐ Blødning ☐ Uklassifiserbar

Trombektomi ☐ Ja ☐ Nei

Starttidspunkt for trombolyse (dag/måned/år/timer/minutter)

☐☐☐☐ 2 0 ☐☐ ☐☐☐☐

TOAST klassifikasjon, hvis hjerneinfarkt

☐ Aterosklerose (storkarsykdom) ☐ Kardial emboli ☐ Småkar-sykdom

☐ Annen årsak ☐ Ukjent årsak/ flere mulige årsaker

Annen sannsynlig årsak (tillegg til TOAST – velg én)

☐ Disseksjon ☐ Protrombotisk tilstand ☐ Graviditet

☐ Atrieflimmer ☐ PFO

☐ Hjerteinfarkt ☐ Endokarditt ☐ Storkarsykdom

☐ Småkarsykdom ☐ Klaffefeil

4

UNDER SYKEHUSOPPHOLDET

Blodtrykk og puls ved innkomst ☐☐☐/☐☐☐ ☐☐☐

Blodtrykk og puls dag 1 ☐☐☐/☐☐☐ ☐☐☐

Oksygenmetning i % i løpet av første 24 t. ☐☐☐

Blodtrykk og puls dag 7/utreisedag ved utreise før dag 7. ☐☐☐/☐☐☐ ☐☐☐

Komplikasjoner

Kramper
☐ Ja ☐ Nei ☐ Usikker

Nevrologisk progresjon
☐ Ja ☐ Nei ☐ Usikker

Infeksjon behandlet med antibiotika
☐ Ja ☐ Nei ☐ Usikker

Hvis ja: ☐ UVI ☐ Luftveisinfeksjon ☐ Annet

Fall
☐ Ja ☐ Nei ☐ Usikker

Aktivitetsbrikke under oppholdet
☐ Ja ☐ Nei

Årsak hvis nei: _____

Vekt i kg ☐☐☐

Høyde i cm ☐☐☐

Midjeomkrets i cm ☐☐☐

Hofteomkrets i cm ☐☐☐

Hvis det ikke er mulig å veie/måle, angi årsak: _____

Har pasienten kliniske tegn på neglekt?
☐ Ja ☐ Nei ☐ Usikker

Fremstår pasienten som skrøpelig?
☐ Ja ☐ Nei ☐ Usikker

BLODPRØVER

Elektrolytter

Natrium (Na) ☐☐☐
Kalium (K) ☐,☐
Kalsium (Ca) ☐,☐☐

Hematologi

Hemoglobin (Hb) ☐☐,☐
Leukocytter (Leuk) ☐☐,☐
Trombocytter (Tromb) ☐☐☐

Lipider

Total kolesterol ☐☐,☐
LDL ☐,☐
HDL ☐,☐
Triglycerider ☐,☐

Annet

Glukose ☐☐,☐
TSH ☐☐,☐
Fritt T4 ☐☐,☐
HbA1c ☐☐,☐
INR ☐,☐
Kreatinin ☐☐☐
CRP ☐☐☐
Høy-sensitiv CRP ☐,☐☐
Troponin T ☐☐☐☐

Vitamin B12 ☐☐☐
Folat ☐☐
Homocystein ☐☐,☐

Blodprøver tatt til biobank?
☐ Ja ☐ Nei

Hvis ja, løpenummer i biobank:
☐

BILDEDIAGNOSTIKK OG ANDRE MEDISINSKE UNDERSØKELSER

EKG ☐ Ja ☐ Nei

Rytme:

Sinusrytme ☐ Ja ☐ Nei

Atrieflimmer/flutter ☐ Ja ☐ Nei

Ventrikkeltachykardi ☐ Ja ☐ Nei

EKG-kompleks:

Normalt ☐ Ja ☐ Nei

Tidligere hjerteinfarkt ☐ Ja ☐ Nei

Akutt infarkt ☐ Ja ☐ Nei

Venstre-ventrikkel hypertrofi ☐ Ja ☐ Nei

ST-depresjon eller T-inversjon i minst 2 tilgrensende avledninger ☐ Ja ☐ Nei

Telemetri ☐ Ja ☐ Nei

Hvis ja:

Sinus ☐ Ja ☐ Nei

Atrieflimmer/flutter ☐ Ja ☐ Nei

Ventrikkeltachykardi ☐ Ja ☐ Nei

CT utført ☐ Ja ☐ Nei

Hvis ja:

Ferskt infarkt ☐

Gamle infarktforandringer ☐

Kronisk iskemi ☐

Blødning ☐

Tumor ☐

Negativt ☐

MR utført ☐ Ja ☐ Nei

Hvis ja:

Ferskt infarkt ☐

Gamle infarktforandringer ☐

Kronisk iskemi ☐

Blødning ☐

Tumor ☐

Negativt ☐

☐ Evt. Fazekas grad

Ultralyd ekstrakranielle kar ☐ Ja ☐ Nei

Hvis ja:

Stenose ☐ Ja ☐ Nei

Stenosegrad: _____ %

Okklusjon ☐ Ja ☐ Nei

Disseksjon ☐ Ja ☐ Nei

Plakk ☐ Ja ☐ Nei

Hvis plakk: ☐ harde ☐ bløte ☐ begge deler ☐ uspesifisert

Ekstrakraniell CT/MR angio utført? ☐ Ja ☐ Nei

Hvis ja:

Stenose ☐ Ja ☐ Nei

Stenosegrad: _____ %

Okklusjon ☐ Ja ☐ Nei

Disseksjon ☐ Ja ☐ Nei

Plakk ☐ Ja ☐ Nei

Annet (evt. funn, f.eks. aneurismer):

_____

Intracerebral CT/MR angio utført? ☐ Ja ☐ Nei

Hvis ja:

Stenose ☐ Ja ☐ Nei

Stenosegrad: _____ %

Okklusjon ☐ Ja ☐ Nei

Disseksjon ☐ Ja ☐ Nei

Plakk ☐ Ja ☐ Nei

Annet (evt. funn, f.eks. aneurismer, karmalformasjoner):

_____

Bildediagnostikk hjerte ☐ Ja ☐ Nei

Evt. hvilke patologiske funn:

_____

☐ Transtorakal ekkokardiografi

☐ Transøsofagal ekkokardiografi

6

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: | | | | | 2 | 0 | | |

Tester: | | | |

Pasient-ID: | | | | | | |

Metode for innhenting av data:

☐ Intervju av pasient ☐ Intervju av pårørende ☐ Intervju av helsepersonell ☐ Sykejournal ☐ Telefonintervju

Opplysninger mangler:

Hvordan håndteres legemidlene? ☐ selvhjulpen ☐ vha. pårørende ☐ hjemmesykepleie ☐ ingen faste medikamenter

MEDIKAMENTLISTE

FASTE MEDIKAMENTER preparatnavn		Dose ved innkomst	ATC-KODE						
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

MEDIKAMENTER VED UTREISE preparatnavn		Dose	ATC-KODE						
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: | | | | | 2 | 0 | | |

Tester: | | | |

Pasient-ID: | | | | | | |

Metode for innhenting av data:

☐ Intervju av pasient ☐ Intervju av pårørende ☐ Intervju av helsepersonell ☐ Sykejournal ☐ Telefonintervju

Opplysninger ikke tilgjengelig:

MODIFIED RANKIN SCALE

	Før hjerneslaget	**Dag 7** / Utreise hvis utskriving før dag 7
Dato		
Skår		

0. **Ingen symptomer i det hele tatt.**
   Pasienten skal ikke ha noen begrensninger eller symptomer.

1. **Ingen betydningsfull funksjonssvikt til tross for symptomer; klarer å utføre alle oppgaver og aktiviteter som før.**
   Pasienten har noen symptomer, enten fysiske eller kognitive, f. eks affeksjon av språk/tale, evne til å lese/skrive, fysisk mobilitet, sensibilitet, syn, svelg, humør, men kan fortsette å ta del i alt tidligere arbeid, sosial- eller fritidsaktiviteter. Det avgjørende spørsmålet for å skille mellom 1 og 2 kan være: Klarer pasienten alle aktiviteter som han før gjorde mer enn månedlig?

2. **Lett funksjonssvikt; klarer ikke å utføre alle aktiviteter som før, men klarer sine daglige gjøremål.**
   Pasienten kan ikke lenger gjøre en del av de aktivitetene som han/hun tidligere vanligvis har gjort. (F. eks kjøre bil, danse, lese, arbeide), men klarer fortsatt å ta vare på seg selv uten hjelp fra andre fra dag til dag. Pasienten kan klare påkledning, forflytning, matlaging/spisesituasjon, toalettbesøk, lage enkle måltider, handle og reise i lokalmiljøet uten å måtte motta hjelp eller tilsyn fra andre. Pasienten skal kunne være overlatt til seg selv alene hjemme i en uke eller mer uten bekymring.

3. **Moderat funksjonssvikt; trenger noe hjelp, men går uten hjelp.**
   Pasiebten trenger ikke hjelp til forflytning/gange (selvstendig forflytning med og uten hjelpemiddel som stokk, rullator). Klarer påkledning, toalettbesøk og å spise etc, men trenger hjelp til mer komplekse aktiviteter. Noen andre må handle, lage mat, vaske – og må besøke pasienten oftere enn ukentlig for å sørge for at disse aktivitetene er gjennomført. Assistansen kan være fysisk eller rådgivende, f. eks pasienten trenger tilsyn eller motivering for å klare finansielle gjøremål.

4. **Alvorlig funksjonssvikt; klarer ikke å gå uten hjelp og klarer ikke å ivareta sine grunnleggende behov uten hjelp.**
   Pasienten må ha hjelp fra andre til noen daglige aktiviteter, f. eks gange, påkledning, toalett, spise. Pasienten blir besøkt minst en og vanligvis to eller flere ganger daglig, eller må bo i nærheten av en hjelper. For å skille 4 fra grad 5 – ta stilling til om pasienten kan bli latt alene for moderate perioder i løpet av dagen.

5. **Svært alvorlig funksjonssvikt; sengeliggende og trenger konstant tilsyn og hjelp.**
   Noen andre må alltid være tilgjengelig på dagtid og noen ganger i løpet av natten – denne trenger ikke være en sykepleier.

6. **Død**.

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: | | | | | 2 | 0 | | |

Tester: | | | |

Pasient-ID: | | | | | | |

Metode for innhenting av data:

- ☐ Intervju av pasient
- ☐ Intervju av pårørende
- ☐ Intervju av helsepersonell
- ☐ Sykejournal
- ☐ Telefonintervju

☐ Testbar ☐ Ikke testbar

Årsak til ikke testbar:

☐ Afasi ☐ Redusert bevissthet ☐ Medisinsk ustabil

☐ Forstår ikke norsk ☐ Redusert kognitiv funksjon ☐ Demens

Annen årsak: _____

BARTHEL INDEX

	Dag 7 / utreise hvis utskriving før dag 7
DATO	
SPISING **10.** Helt selvhjulpen. Kan bruke nødvendige hjelpemidler og spiser innen rimelig tid **5.** Må ha hjelp til enkelte funksjoner, f. eks å skjære **0.** Totalt avhengig av andre for å kunne spise	
BADING/DUSJ **5.** Helt selvhjulpen **0.** Trenger hjelp	
PERSONLIG HYGIENE **5.** Selvhjulpen. Klarer å vaske ansikt, kamme hår, børste tenner og barbering **0.** Trenger hjelp til en eller flere funksjoner	
PÅKLEDNING **10.** Selvhjulpen. Klarer å knyte sko, kneppe knapper **5.** Trenger hjelp, men klarer halvparten innen rimelig tid **0.** Trenger hjelp til mer enn halvparten	
TARMKONTROLL **10.** Kontinent. Klarer selv eventuelt å sette stikkpille/klyx **5.** Nedsatt kontroll og enkelte "uhell". Trenger hjelp til eventuelt å sette stikkpille/klyx **0.** Helt inkontinent eller hyppige "uhell"	
BLÆREKONTROLL **10.** Kontinent. Selvhjulpen og holder seg tørr ved bruk av uridom **5.** Nedsatt kontroll og enkelte "uhell" og holder seg tørr med uridom o.l. men trenger hjelp til å bruke dette **0.** Helt inkontinent eller trenger permanent kateter	
TOALETTBESØK **10.** Selvhjulpen på toalett/dostol eller bekken. Ordner klær, tørker seg, spyler toalettet eller tømmer bekken **5.** Trenger hjelp til klær, papir etc. **0.** Kan ikke bruke toalett/dostol	
STOL/SENG - FORFLYTNING **15.** Selvhjulpen. Klarer også å låse rullestol og bevege forstøtte **10.** Klarer forflytning med litt hjelp eller tilsyn **5.** Kan sitte men må ha mye hjelp ved forflytning **0.** Kan ikke sitte. Sengeliggende eller må løftes	
MOBILITET **15.** Klarer å gå 50 meter. Kan bruke stokk eller krykke, men ikke rullator **10.** Kan gå 50 meter med rullator og støtte/tilsyn av en person **5.** Kan ikke gå, men kan kjøre rullestol uten hjelp/tilsyn i 50 meter **0.** Kan ikke kjøre rullestol uten hjelp	
TRAPPEGANG **10.** Selvhjulpen med eller uten bruk av hjelpemidler **5.** Trenger hjelp/tilsyn av en person **0.** Kan ikke gå i trapp	
SUM: (totalt 100 poeng)	

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: 2 0

Tester:

Pasient-ID:

Metode for innhenting av data:

☐ Intervju av pasient ☐ Intervju av pårørende ☐ Telefonintervju

Opplysninger mangler:

NOTTINGHAM I-ADL

SE NØKKEL FØR UTFYLLING

Få fram det personen faktisk gjør, og har gjort de siste to ukene (ikke hva vedkommende tror eller ønsker han/hun kan gjøre).

SKÅRSKALA

Nei	0
Med hjelp	1
Alene med vansker	2
Alene	3

	Nei	Med hjelp	Alene med vansker	Alene
MOBILITET				
1. Går du omkring utendørs?	☐	☐	☐	☐
2. Går du i trapper?	☐	☐	☐	☐
3. Kommer du deg inn og ut av bilen?	☐	☐	☐	☐
4. Går du på ujevnt underlag?	☐	☐	☐	☐
5. Krysser du veier?	☐	☐	☐	☐
6. Reiser du med offentlig transport?	☐	☐	☐	☐
7. Spiser du selv?	☐	☐	☐	☐
8. Lager du varm drikke?	☐	☐	☐	☐
9. Tar du med varme drikker fra ett rom til et annet?	☐	☐	☐	☐
10. Tar du oppvasken?	☐	☐	☐	☐
11. Lager du et enkelt varmt måltid til deg selv?	☐	☐	☐	☐
12. Håndterer du egne penger når du er ute?	☐	☐	☐	☐
13. Tar du småvask/håndvask?	☐	☐	☐	☐
14. Gjør du husarbeidet selv?	☐	☐	☐	☐
15. Gjør du innkjøpene dine selv?	☐	☐	☐	☐
16. Tar du en hel klesvask?	☐	☐	☐	☐
17. Leser du aviser eller bøker?	☐	☐	☐	☐
18. Bruker du telefonen?	☐	☐	☐	☐
19. Skriver du brev?	☐	☐	☐	☐
20. Går du ut for sosialt samvær?	☐	☐	☐	☐
21. Steller du din egen hage?	☐	☐	☐	☐
22. Kjører du bil?	☐	☐	☐	☐

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: | | | | | 2 | 0 | | |

Tester: | | | |

Pasient-ID: | | | | | | |

Metode for innhenting av data:

- ☐ Klinisk us.
- ☐ Sykejournal
- ☐ Testbar
- ☐ Ikke testbar

Årsak til ikke testbar:

- ☐ Afasi
- ☐ Redusert bevissthet
- ☐ Medisinsk ustabil
- ☐ Forstår ikke norsk
- ☐ Redusert kognitiv funksjon
- ☐ Demens

Annen årsak: _____

NIH STROKE SCALE (NIHSS)		Dato / Tid	Ankomst	Dag 1	Dag 7/utreise (hvis utreise før dag 7)
1a	**Bevissthetsnivå** 0 = Våken 1 = Døsig, reagerer adekvat ved lett stimulering 2 = Døsig, reagerer først ved kraftigere/gjentatt stimulering 3 = Reagerer ikke, eller bare med ikke-målrettet bevegelse				
1b	**Orientering** (spør om måned + alder) 0 = Svarer riktig på to spørsmål 1 = Svarer riktig på ett spørsmål (eller ved alvorlig dysartri) 2 = Svarer **ikke** riktig på noe spørsmål				
1c	**Respons på kommando** (lukke øyne + knytte hånd) 0 =Utfører begge kommandoer korrekt 1 = Utfører en kommando korrekt 2 = Utfører ingen korrekt				
2	**Blikkbevegelse** (horisontal bevegelse til begge sider) 0 = Normal 1 = Delvis blikkparese (eller ved øyenmuskelparese) 2 = Fiksert blikkretning til siden eller total blikkparese				
3	**Synsfelt** (bevege fingre/fingertelling i laterale synsfelt) 0 = Normalt 1 = Delvis hemianopsi 2 = Total hemianopsi 3 = Bilateral hemianopsi/blindhet/koma				
4	**Ansikt** (vise tenner, knipe igjen øynene, løfte øyenbryn) 0 = Normal 1 = Utvisket nasolabialfure, asymmetri ved smil 2 = Betydelig lammelse i nedre ansiktshalvdel 3 = Total lammelse i halve ansiktet (eller ved koma)				
5	**Kraft i armen** (holde armen utstrakt 45° i 10 sekunder) 0 = Normal (også ved "ikke testbar") 1 = Drifter til lavere posisjon 2 = Noe bevegelse mot tyngdekraften, drifter til sengen 3 = Kun små muskelbevegelser, faller til sengen 4 = Ingen bevegelse/koma	ve hø			
6	**Kraft i benet** (holde benet utstrakt 30° i 5 sekunder) 0 = Normal (også ved ikke testbar) 1 = Drifter til lavere posisjon 2 = Noe bevegelse mot tyngdekraften, drifter til sengen 3 = Ingen bevegelse mot tyngdekraften, faller til sengen 4 = Ingen bevegelse	ve hø			
7	**Koordinasjon/ataksi** (finger-nese-prøve/hæl-kne-prøve) 0 = Normal (også ved ikke testbar eller koma) 1 = Ataksi i arm eller ben 2 = Ataksi i arm og ben				
8	**Hudfølelse** (sensibilitet for stikk) 0 = Normal 1 = Lettere sensibilitetsnedsettelse 2 = Markert sensibilitetsnedsettelse (også ved koma, tetraparese)				
9	**Språk/afasi** (spontan tale, taleforståelse, leseforståelse, benevning) 0 = Normal 1 = Moderat afasi, samtale mulig 2 = Markert afasi, samtale svært vanskelig eller umulig 3 = Ikke språk/koma				
10	**Tale/dysartri** (spontan tale) 0 = Normal 1 = Mild – moderat dysartri 2 = Nær uforståelig tale eller anartri/koma				
11	**Neglekt** (bilateral simultan stimulering av syn og hudsensibilitet) 0 = Normal (også ved hemianopsi med normal sensibilitet) 1 = Neglekt i en sansemodalitet 2 = Neglekt i begge sansemodaliteter/koma				
	Total NIHSS-Score				

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: _ _ _ _ 2 0 _ _

Tester: _ _ _

Pasient-ID: _ _ _ _ _ _

Metode for innhenting av data:

- ☐ Klinisk undersøkelse
- ☐ Testbar
- ☐ Ikke testbar

Årsak til ikke testbar:

- ☐ Afasi
- ☐ Redusert bevissthet
- ☐ Medisinsk ustabil
- ☐ Forstår ikke norsk
- ☐ Redusert kognitiv funksjon
- ☐ Demens

Annen årsak: _____

MONTREAL COGNITIVE ASSESSMENT (MOCA) norsk versjon 7.1.

	POENG
1., 2. og 3. VISUOKONSTRUKTIV/EKSEKUTIV (utføres på eget ark) ☐ **1A2B** ☐ **Kopier kube** **Tegn en klokke** (ti over elleve) ☐ Kontur ☐ Tall ☐ Visere	/5
4. BENEVNING ☐ Løve ☐ Neshorn ☐ Kamel eller dromedar	/3
5. HUKOMMELSE Les ordene, forsøksperson må gjenta dem. Gjør to forsøk, selv om første forsøk gjennomføres helt riktig. Gjør gjenkalling etter 5 minutter. **ANSIKT** **FLØYEL** **KIRKE** **TUSENFRYD** **RØD** 1. forsøk ☐ ☐ ☐ ☐ ☐ 2. forsøk ☐ ☐ ☐ ☐ ☐	ingen poeng
6. OPPMERKSOMHET Les rekken med tall (1 tall/sekund) Forsøksperson skal gjenta i samme rekkefølge ☐ **2 1 8 5 4** Forsøksperson skal gjenta i baklengs rekkefølge ☐ **7 4 2**	/2
Les listen med bokstaver. På hver bokstav A skal forsøkspersonen banke på bordet med hånden sin. Ingen poeng ved 2 feil ☐ **F B A C M N A A J K L B A F A K D E A A A J A M O F A A B**	/1
Seriell subtraksjon med 7, begynnende med **100** **93** ☐ **86** ☐ **79** ☐ **72** ☐ **65** ☐ 4 eller 5 riktig: 3 png 2 eller 3 riktig: 2 png 1 riktig: 1png 0 riktig: 0 png	/3
7. SETNINGSREPETISJON **Gjenta etter meg:** Jeg vet kun at det er Jon som skal hjelpe i dag ☐ Katten gjemte seg alltid under sofaen når det var hunder i rommet. ☐	/2
8. ORDFLYT Si så mange ord du kan komme på som begynner med **F** innenfor ett minutt **Antall ord:** ☐ ☐ (N ≥ 11 ord)	/1
9. LIKHETER **Likhet mellom for eksempel en banan og en appelsin=frukt** ☐ tog-sykkel ☐ klokke-linjal	/2
10. UTSATT GJENKALLING **ANSIKT** **FLØYEL** **KIRKE** **TUSENFRYD** **RØD** Kun poeng for gjenkalling uten stikkord. ☐ ☐ ☐ ☐ ☐ Frivillig: Kategori-stikkord ☐ ☐ ☐ ☐ ☐ Frivillig: Multiple-choice stikkord ☐ ☐ ☐ ☐ ☐	/5
11. ORIENTERING ☐ **Dato** ☐ **Måned** ☐ **År** ☐ **Ukedag** ☐ **Sted** ☐ **By**	/6
Total skår Normal ≥26/30 Legg til 1 poeng dersom ≤ 12 år utdanning	/30

Kommentar:

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: 2 0

Tester:

Pasient-ID:

Metode for innhenting av data:

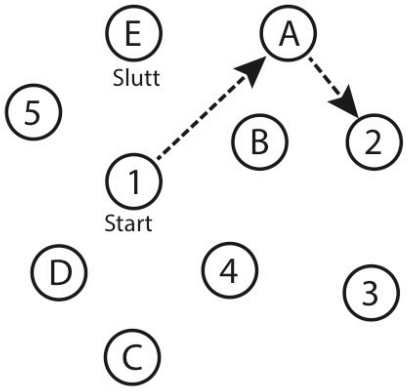
- ☐ Klinisk undersøkelse
- ☐ Testbar
- ☐ Ikke testbar

Årsak til ikke testbar:

- ☐ Afasi
- ☐ Redusert bevissthet
- ☐ Medisinsk ustabil
- ☐ Forstår ikke norsk
- ☐ Redusert kognitiv funksjon
- ☐ Demens

Annen årsak: _____

MOCA trailmaking, kube og klokke



Nor-COAST
Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: 2 0

Tester:

Pasient-ID:

Metode for innhenting av data:

☐ Intervju av pasient ☐ Intervju av pårørende ☐ Telefonintervju

Opplysninger mangler:

AD8 DEMENS SCREENING INTERVJU

Husk, «Ja, en endring» indikerer at det har vært en endring i det siste året forårsaket av kognitive (tenkning og hukommelse) problemer.		JA, en endring	NEI, ingen endring	Vet ikke
1.	Problemer med å bedømme (for eksempel problemer med å ta beslutninger, dårlige økonomiske beslutninger, problemer med å tenke)			
2.	Mindre interessert i hobbyer/aktiviteter			
3.	Gjentar de samme tingene om og om igjen (spørsmål, historier eller uttalelser)			
4.	Problemer med å lære hvordan man bruker et verktøy, utstyr eller ulike tekniske enheter (eks. videospiller, data, mikrobølgeovn, fjernkontroll)			
5.	Glemmer korrekt måned eller år			
6.	Problemer med å håndtere kompliserte økonomiske/finansielle forhold (for eksempel bruk av nettbank, betale skatt og regninger)			
7.	Problemer med å huske avtaler			
8.	**Daglige** problemer med tenking og/eller hukommelse			
	TOTAL AD8 SKÅR			

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Nor-COAST
Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: ☐☐☐☐20☐☐

Tester: ☐☐☐

Pasient-ID: ☐☐☐☐☐☐

Metode for innhenting av data:

☐ Klinisk us.

☐ Testbar

☐ Ikke testbar → **Årsak til ikke testbar:**

☐ Afasi ☐ Redusert bevissthet ☐ Medisinsk ustabil

☐ Forstår ikke norsk ☐ Redusert kognitiv funksjon ☐ Demens

Annen årsak: _____

NEGLEKT - test (del linje på midten)

Avstand fra linjens start til merket: ☐☐,☐ cm, mm

TRAIL-MAKING-test A

Tid (m:ss): ☐☐:☐☐

Forsøkt, men ikke klart ☐

Antall feil
(første feil skal ikke telles) ☐

TRAIL-MAKING-test B

Tid (m:ss): ☐☐:☐☐

Forsøkt, men ikke klart ☐

Antall feil
(første feil skal ikke telles) ☐

Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: | | | | | 2 | 0 | | |

Tester: | | | |

Pasient-ID: | | | | | | |

Metode for innhenting av data:

☐ Klinisk us.

☐ Testbar

☐ Ikke testbar

Årsak til ikke testbar:

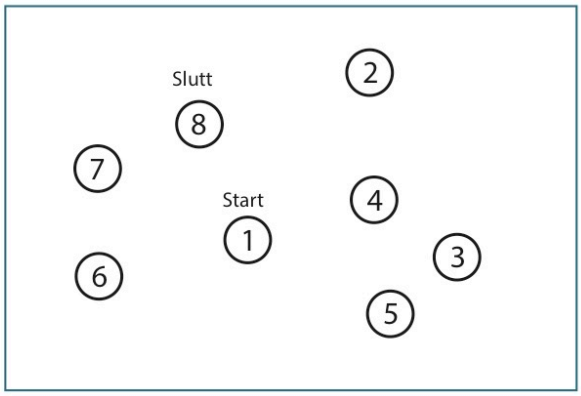
☐ Afasi ☐ Redusert bevissthet ☐ Medisinsk ustabil

☐ Forstår ikke norsk ☐ Redusert kognitiv funksjon ☐ Demens

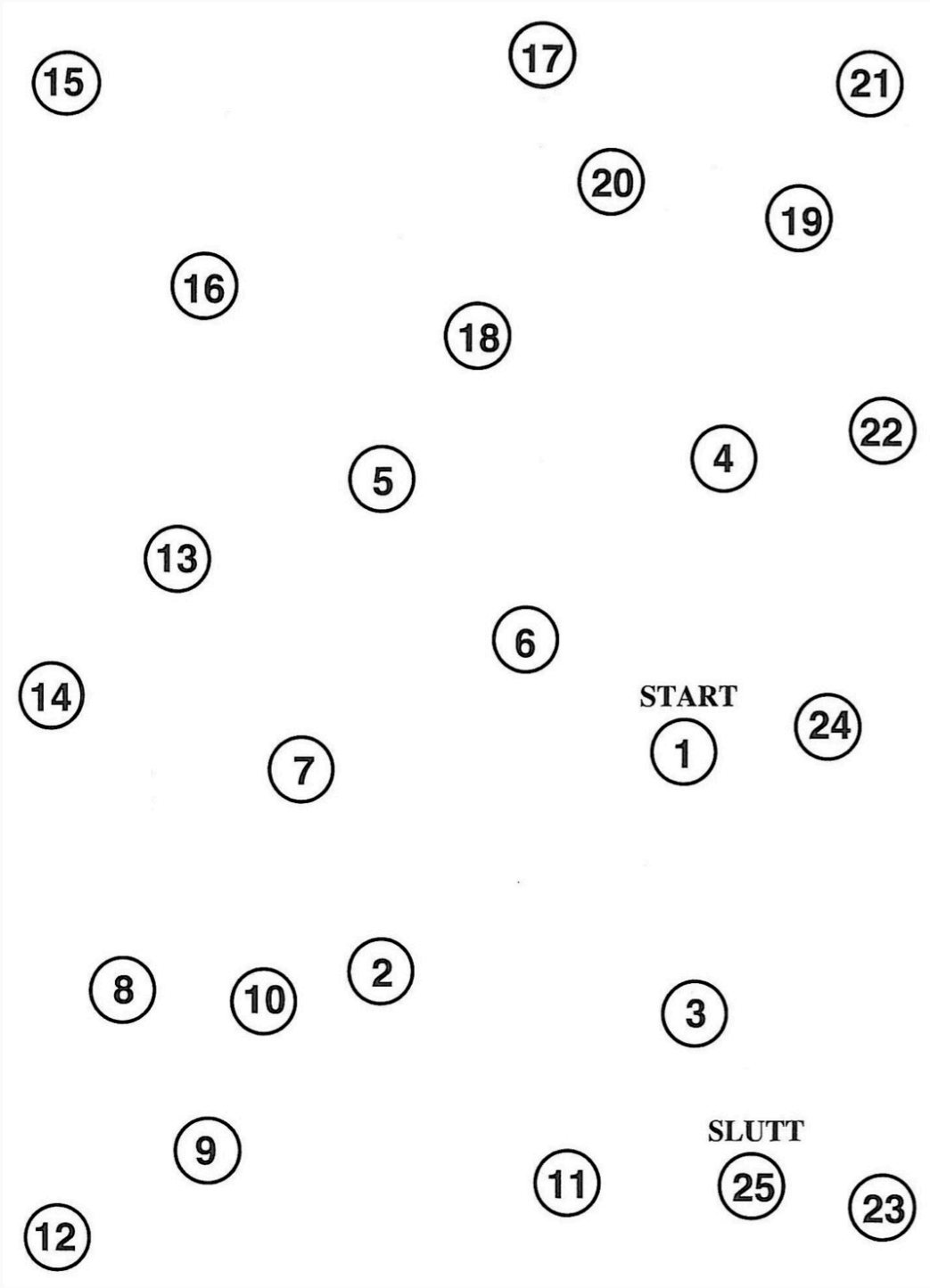
Annen årsak: _____

Trailmaking A forsøk

EKSEMPEL



Trail making Test A



Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: 2 0

Tester:

Pasient-ID:

Metode for innhenting av data:

- ☐ Klinisk us.
- ☐ Testbar
- ☐ Ikke testbar

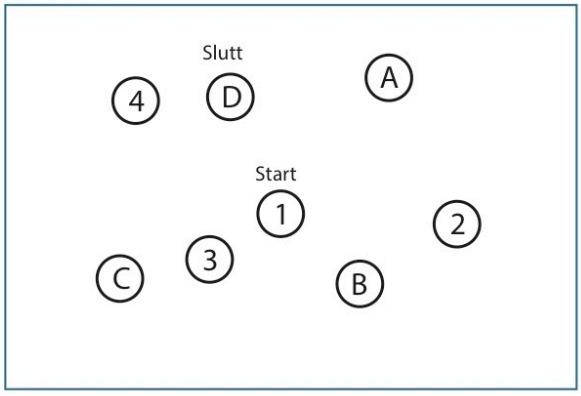
Årsak til ikke testbar:

- ☐ Afasi
- ☐ Redusert bevissthet
- ☐ Medisinsk ustabil
- ☐ Forstår ikke norsk
- ☐ Redusert kognitiv funksjon
- ☐ Demens

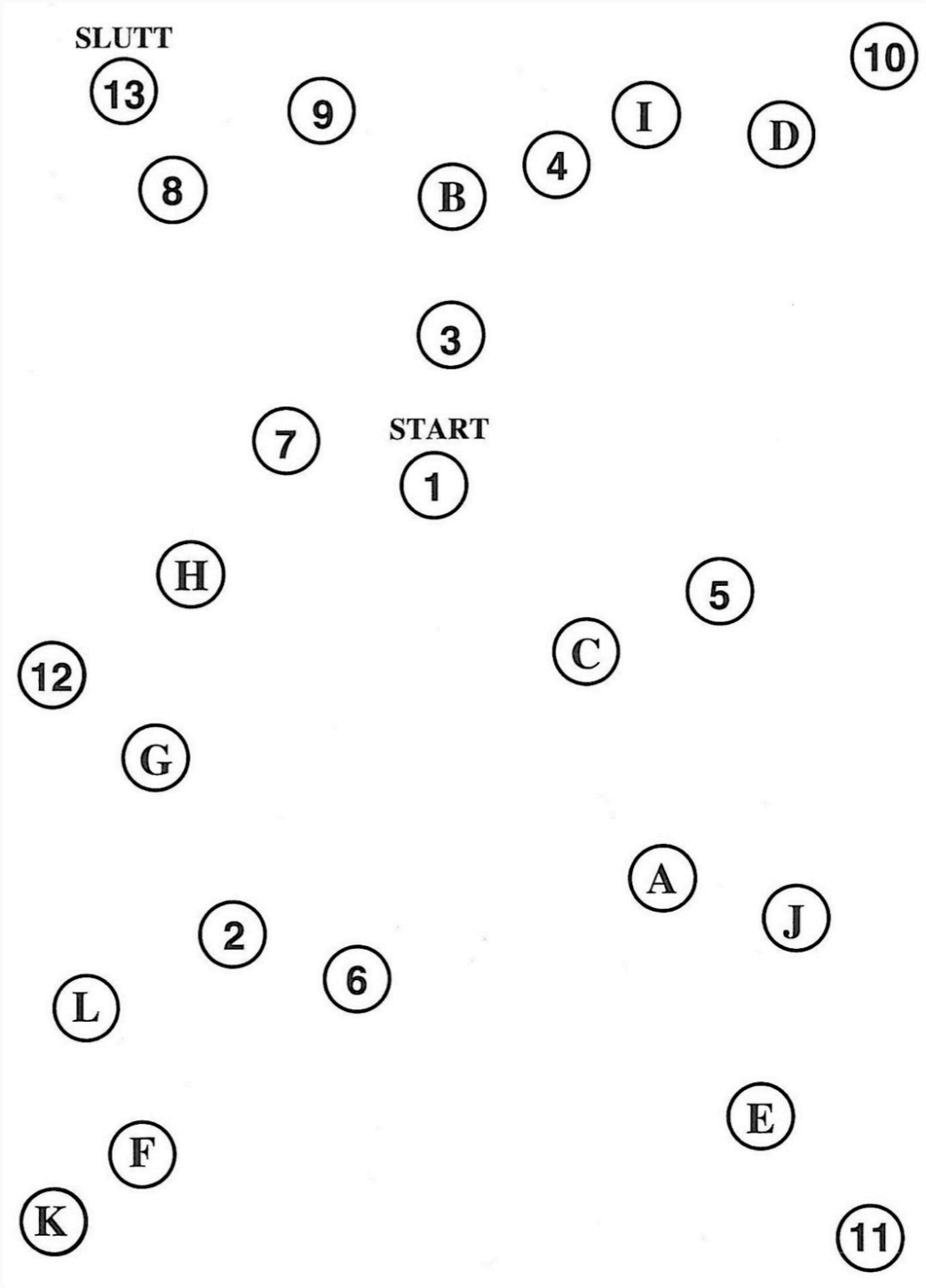
Annen årsak: _____

Trailmaking B forsøk

EKSEMPEL



Trail making Test B



Nor-COAST

Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: | | | | | 2 | 0 | | |

Tester: | | | |

Pasient-ID: | | | | | | |

Metode for innhenting av data:

☐ Intervju av pasient ☐ Intervju av pårørende

Opplysninger mangler:

GLOBAL DETERIORATION SCALE (sett ring rundt eller strek under mest passende skår-nivå før slaget)

Skår- Nivå	Svikt i kognisjon og funksjon	Omsorgsbehov
1. Ingen kognitiv svikt		Uavhengig
2. Svært mild kognitiv svikt	Subjektiv opplevelse av mildt hukommelsestap. Ingen objektive tegn på kognitiv svikt ved intervju, arbeid eller sosial funksjon. Normal ved testing. Ingen funksjonssvikt.	Uavhengig
3. Mild kognitiv svikt (MCI)	Tidligste tydelige svikt, se fotnote. Normalt funksjonsnivå, men kolleger kan ha lagt merke til sviktende funksjon i arbeidssituasjon. Objektiv svikt ved testing. Benekting kan være til stede.	Uavhengig
4. Mild demens	Tydelig svikt ved grundig klinisk intervju, se fotnote. Vanskeligheter med å håndtere komplekse oppgaver, som økonomi, reiseaktivitet. Benektning er vanlig. Trekker seg tilbake fra utfordrende situasjoner.	Kan bo alene – trolig med hjelp fra familie eller omsorgsgiver.
5. Moderat demens	Kan ikke lenger leve uten en viss form for assistanse. Ikke i stand til å huske viktige deler av sin aktuelle livssituasjon, for eksempel adresse, telefonnummer som vedkommende har hatt i flere år, navn på barnebarn osv. En viss grad av desorientering for dato, ukedag, årstid, eller for sted. Trenger ikke assistanse ved toalettbesøk, spising, påkledning, men kan ha behov for hjelp til å velge passende påkledning.	Kan bo hjemme med familie. Kan bo i omsorgsbolig med hjemmehjelp. Det kan være nødvendig med bokollektiv, særlig hvis det er uttalte atferdssymptomer eller fysisk funksjonssvikt.
6. Moderat – alvorlig demens	Kan av og til glemme navnet til ektefellen. Mangler stort sett oversikt over nylige opplevelser og hendelser i deres liv. Trenger hjelp ved personlig ADL. Kan være inkontinent for urin. Atferdsmessige og psykologiske symptomer ved demens (APSD) er vanlig, f.eks. vrangforestillinger, repetitive atferd, agitasjon, angst etc.	Vanligvis sykehjem
7. Alvorlig demens	Personen mister språkfunksjonen. Inkontinens. Trenger mye hjelp i personlig ADL. Mister gangfunksjon, motoriske symptomer.	Sykehjem

3.symptomer på mild kognitiv svikt kan være at pasienten har mistet veien til ukjent sted, får problemer med ord/navn som merkes av pårørende, husker lite av det han leser, navn på nye personer, forlegger eller mister ting. Pasientens nærmeste merker sviktende funksjon

4.symptomer på mild demens: pasienten kan ha nedsatt kunnskap om nåværende og nylige hendelser, problemer med å redegjøre for eget livsløp, problem med hoderegning, håndtere økonomien sin, reise alene

5.symptomer på moderat demens: pasienten husker ikke sin adresse eller telefonnummer gjennom mange år, navn på familiemedlemmer (barnebarn for eksempel), hvilke skoler, arbeidsplasser etc. de har vært på, problemer med tidsorientering

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Nor-COAST
Kartlegging av mental funksjon etter hjerneslag

PRIMÆROPPHOLD

Dato: 2 0

Tester:

Pasient-ID:

Metode for innhenting av data:

☐ Klinisk us.

☐ Testbar

☐ Ikke testbar

Årsak til ikke testbar:

☐ Afasi ☐ Redusert bevissthet ☐ Medisinsk ustabil

☐ Forstår ikke norsk ☐ Redusert kognitiv funksjon ☐ Demens

Annen årsak: _____

FYSISKE TESTER

1. Balansetest

☐ Gjennomført: ☐ Ikke i stand ☐ missing

1.Stå uten støtte
10 sekunder
↓
2.Samlede føtter
10 sekunder
↓
3.Semi-Tandem
10 sekunder
↓
4.Tandem
10 sekunder
↓
5.Ett ben stående inntil
20 sekunder

1. ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)
2. ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)
3. ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)
4. ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)
5. ☐☐ (min) ☐☐ (sek) ☐☐ (tideler) Høyre
5. ☐☐ (min) ☐☐ (sek) ☐☐ (tideler) Venstre

2. 360 graders vending

☐ Gjennomført: ☐ Ikke i stand ☐ missing

***INSTRUKSJON:* Snu deg rundt en hel omgang. Stans. Snu deg så rundt en hel omgang den andre veien. Det brukes ikke hjelpemidler under testen**

☐ 4 Kan snu seg sikkert 360 grader på 4 sekunder eller mindre

☐ 3 Kan snu seg sikkert 360 grader på 4 sekunder eller mindre kun en retning

☐ 2 Kan snu seg sikkert 360 grader, men trenger mer enn 4 sekunder

☐ 1 Trenger tilsyn eller muntlige ledetråder

☐ 0 Trenger støtte under vendingen

Tid vending mot høyre

☐☐ (min) ☐☐ (sek) ☐☐ (tideler)

Tid vending mot venstre

☐☐ (min) ☐☐ (sek) ☐☐ (tideler)

3.a Reise/ sette seg x 1

☐ Gjennomført: ☐ Ikke i stand ☐ Missing

3.b Reise/ sette seg x 5

☐ Gjennomført: ☐ Ikke i stand ☐ Missing

Tid 5 repetisjoner uten armbruk ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)

Tid 5 repetisjoner med armbruk (hvis deltager ikke klarer uten armbruk) ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)

4. 4m Gangtest

☐ Gjennomført: ☐ Ikke i stand ☐ Missing

Hvis mulig gjennomføres testen uten ganghjelpemidler

Ganghjelpemidler ved test (kryss av):

1. ☐ Uten
2. ☐ Krykke/stokk (er)
3. ☐ Rullator
4. ☐ Annet (spesifiser)_____

Tid test 1: ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)

Tid test 2: ☐☐ (min) ☐☐ (sek) ☐☐ (tideler)

5. 10-meter gangtest

☐ Gjennomført: ☐ Ikke i stand ☐ Missing

	Rundetid		
Normal. hast. 1	☐☐ (min)	☐☐ (sek)	☐☐ (tideler)
Normal. hast. 2	☐☐ (min)	☐☐ (sek)	☐☐ (tideler)
Maks. hast. 1	☐☐ (min)	☐☐ (sek)	☐☐ (tideler)
Maks. hast. 2	☐☐ (min)	☐☐ (sek)	☐☐ (tideler)
Dual task hast.1	☐☐ (min)	☐☐ (sek)	☐☐ (tideler)
Dual task hast.2	☐☐ (min)	☐☐ (sek)	☐☐ (tideler)

Bruk av hjelpemidler

- ☐ Ingen
- ☐ Krykke/stokk (er)
- ☐ Rullator
- ☐ Annet (spesifiser) _____

6. 8-talls balansetest

☐ Gjennomført: ☐ Ikke i stand ☐ Missing

Testen er utført ☐ med sko ☐ uten sko

Total antall feiltråkk: ☐

Tid: ☐☐ (min) . ☐☐ (sek) ☐☐ (tideler)

7. Gripestyrke

Høyre hand: ☐ Gjennomført: ☐ Ikke i stand ☐ Missing

Venstre hand: ☐ Gjennomført: ☐ Ikke i stand ☐ Missing

Dynamometer:

Transverst volargrep	Høyre hånd (kg)	Venstre hånd (kg)
Prøve forsøk		
2. forsøk		
3. forsøk		

---

8. Nine Hole Peg Test

Antall sekunder som benyttes for å plassere alle 9 peg-er registreres (testen avbrytes etter 2 minutter).

Høyre hand: ☐ Gjennomført: ☐ Ikke i stand ☐ Missing

Venstre hand: ☐ Gjennomført: ☐ Ikke i stand ☐ Missing

	Høyre hånd		Venstre hånd	
	Ant. sekunder:	Ant. peg plassert:	Ant. sekunder:	Ant. peg plassert:
Forsøk				
Test	☐☐ (min) ☐☐ (sek) ☐☐ (tideler)		☐☐ (min) ☐☐ (sek) ☐☐ (tideler)	

Appendix 3. NHR questionnaire

Norsk hjerneslagregister

Akuttskjema 2016
Anvendes ved registrering av alle pasienter innlagt med akutt hjerneslag fra og med 01.01.2016

Personnummer

Navn

Adresse

Telefon

Inklusjonskontroll. Pasienten har hjerneslagdiagnose i henhold til ett av følgende kriterier:

- ☐ 1 Vedvarende akutte fokale utfall (> 24 timer) med positiv bildediagnostikk. Innlagt i sykehus innen 28 døgn fra symptomdebut.
- ☐ 2 Vedvarende akutte fokale utfall (> 24 timer) uten positiv bildediagnostikk. Innlagt i sykehus innen 28 døgn fra symptomdebut.
- ☐ 3 Ingen av ovennevte, pasienten skal ikke registreres

Slagdiagnose

- ☐ I 61 Hjerneblødning (CT/MR eller obduksjon har vist blødning)
- ☐ I 63 Hjerneinfarkt (CT/MR obduksjon er uten aktuell patologi eller har vist et aktuelt infarkt)
- ☐ I 64 Hjerneslag ikke spesifisert som blødning eller infarkt (CT/MR ikke utført)

Hjerneslag som hoveddiagnose eller bidiagnose

- ☐ Hoveddiagnose
- ☐ Bidiagnose

Tilstand før det aktuelle hjerneslaget

Boligforhold

- ☐ 1 Egen bolig uten hjemme-sykepleie/hjemmehjelp
- ☐ 2 Egen bolig med hjemme-sykepleie/hjemmehjelp
- ☐ 3 Omsorgsbolig med døgn-kontinuerlige tjenester
- ☐ 4 Sykehjem
- ☐ 9 Ukjent

Sivilstatus

- ☐ 1 Gift/samboende
- ☐ 2 Enke/enkemann
- ☐ 3 Enslig
- ☐ 9 Ukjent

Bosituasjon

- ☐ 1 Pasienten bodde alene
- ☐ 2 Pasienten bodde sammen med noen (f.eks. ektefelle/samboer, søsken, barn)
- ☐ 3 Pasienten bodde i institusjon/sykehjem
- ☐ 9 Ukjent

Forflytning

- ☐ 1 Alene/uten tilsyn, både inne og ute (bruk av hjelpemiddel tillatt)
- ☐ 2 Alene/uten tilsyn inne, men ikke ute
- ☐ 3 Med hjelp av andre
- ☐ 9 Ukjent

Toalettbesøk

- ☐ 1 Pasienten klarte toalettbesøk alene
- ☐ 2 Pasienten trengte hjelp til bruk av bekken eller bleie, eller trengte hjelp under toalett-besøket
- ☐ 9 Ukjent

Påkledning

- ☐ 1 Pasienten klarte av- og påkledning selv, også ytter-klær, sko og strømper
- ☐ 2 Pasienten trengte hjelp med av- og påkledning
- ☐ 9 Ukjent

Funksjonsstatus

Modified Rankin Scale (Se egen veiledning) ☐ 0-5 ☐ Ikke utført

Risikofaktorer før hjerneslaget

Tidligere hjerneslag? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvis ja, anfør type hjerneslag

- ☐ 1 Infarkt
- ☐ 2 Blødning
- ☐ 3 Uspesifisert
- ☐ 4 Både infarkt og blødning
- ☐ 9 Ukjent

Tidligere TIA? (Opplysninger om sikre tegn på TIA i form av klare forbigående fokale utfall) ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvis ja, når var siste TIA?

- ☐ 1 Innen siste uke
- ☐ 2 1-4 uker før slaget
- ☐ 3 4-12 uker før slaget
- ☐ 4 Over 12 uker før slaget

Tidligere hjerteinfarkt? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Side 1

Risikofaktorer før hjerneslaget (fortsettelse)

Gjennomgått store hjerte-/karintervensjoner?
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Atrieflimmer bekreftet med EKG tidligere eller i løpet av innleggelsen (gjelder også paroxystisk atrieflimmer/flutter)?
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Når ble arterieflimmer oppdaget?
☐ 1 Arterieflimmer tidligere
☐ 2 Arterieflimmer nyoppdaget ved ankomst til sykehuset eller under innleggelsen

Diabetes, tidligere diagnostisert eller nyoppdaget?
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Røykestatus
☐ 0 Aldri
☐ 1 Røyker
☐ 2 Eks-røyker (røykfri > 1 mnd)
☐ 9 Ukjent

Status i akuttfasen

Bevissthetsgrad ved innleggelsen
☐ 0 Våken
☐ 1 Døsig, reagerer adekvat ved lett stimulering
☐ 2 Døsig, reagerer først ved kraftig/gjentatt stimulering
☐ 3 Reagerer ikke, eller bare med ikke-målrettet bevegelse
☐ 9 Ukjent

Fokale utfall

Facialisparese
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Beinparese
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Armparese
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Språkproblemer (afasi)
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Andre nye fokale slagsymptomer
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvilke fokale symptomer?
☐ Dysartri
☐ Ataksi
☐ Sensibilitetsutfall
☐ Neglekt
☐ Dobbeltsyn
☐ Synsfeltutfall
☐ Vertigo

NIHSS (National Institutes of Health Stroke Scale)

Angi totalscore akutt ved innkomst ☐ Ikke utført

Angi totalscore ved 24 timer +/÷ 12 timer etter innkomst ☐ Ikke utført

Cerebral CT eller MR ved innkomst (innen 12 t)?
☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Sidelokalisasjon av symptomer
☐ 1 Høyre ☐ 2 Venstre ☐ 3 Bilateralt ☐ 4 Ikke relevant ☐ 9 Ukjent

Medikamentell behandling før debut av hjerneslaget og ved utreise

Dersom det er dokumentert i journal/epikrise at pasienten starter med anti-koagulasjon innen to uker etter symptom-debut av hjerneslaget kan det krysses av for ***antikoagulasjon ved utreise***

Dersom det er dokumentert i journal/epikrise at pasienten starter med medikamentell behandling for høyt blodtrykk innen to uker etter symptomdebut av hjerneslaget kan det krysses av for ***«Medikamentell behandling for høyt blodtrykk»*** ved utreise.

Ved mors registreres alle medikamenter ved utreise som ***Nei***

Medikament (Eksempler)	**Før debut av hjerneslaget** Ja 1	Nei 2	Ukjent 9	**Ved utreise** Ja 1	Nei 2	Ukjent 9
Acetylsalisylsyre (ASA) (Asasantin Retard, Acetylsalisylsyre, Albyl E, Aspirin, Axanum, Dispril, Globoid)	☐	☐	☐	☐	☐	☐
ADP-reseptorblokker (Brilique, Clopidogrel, Efient, Plavix)	☐	☐	☐	☐	☐	☐
Dipyridamol (Asasantin Retard, Persantin (Retard)):	☐	☐	☐	☐	☐	☐
Warfarin (Marevan)	☐	☐	☐	☐	☐	☐
Andre perorale antikoagulasjonsmidler enn Warfarin (Angiox, Arixtra, Eliquis, Novastan, Pradaxa, Xarelto)	☐	☐	☐	☐	☐	☐
Statin og annen lipidsenkende behandling (Atorvastatin, Cholestagel, Crestor, Ezetrol, Inegy, Lescol. Lestid, Lipitor, Lovastatin, Omacor, Pravachol, Pravastatin, Ques-tran, Simvastatin, Sortis, Zocor)	☐	☐	☐	☐	☐	☐
Medikamentell behandling for høyt blodtrykk (kalsiumblokkere, ACE-hemmere, A2 (angiotensin), betablokkere, og diuretika)	☐	☐	☐	☐	☐	☐

Hvilke antikoagulasjonsmidler?
☐ Apixaban (f.eks Eliquis) ☐ Dabigatran (f.eks Pradaxa)
☐ Rivaroxaban (f.eks Xarelto) ☐ Annet peroralt antikoagulasjonsmiddel

Er pasienten vurdert for reperfusjonsbehandling (trombolyse/trombektomi)

☐ 1 Ja
☐ 2 Nei
☐ 9 Ukjent

Hvis ja:
☐ 1 Behandlet med trombolyse/trombektomi
☐ 2 Ikke behandlet – kontraindikasjon

Trombolytisk behandling

Trombolyse ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvilket sykehus? _____

Starttidspunkt for trombolyse
Dato | Måned | År | Timer | Min

NIHSS (Totalscore) *Før* trombolyse _____ ☐ Ikke utført

NIHSS (Totalscore) 24 t *etter* trombolyse _____ ☐ Ikke utført

Hjerneblødning med klinisk forverring innen 36 timer etter behandlingsstart tilsvarende 4 poeng eller mer på NIHSS (skal være verifisert med CT/MR eller obduksjon ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Trombektomi

Er trombektomi eller annen endovaskulær behandling gjennomført? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvilket sykehus? _____

Starttidspunkt for trombektomi
Dato | Måned | År | Timer | Min

NIHSS (Totalscore) *Før* trombolyse _____ ☐ Ikke utført

NIHSS (Totalscore) 24 t *etter* trombektomi _____ ☐ Ikke utført

Hemikraniektomi

Er hemikraniektomi gjennomført? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvilket sykehus? _____

Starttidspunkt for hemikraniektomi
Dato | Måned | År | Timer | Min

Behandlingskjeden

Symptomdebut
Angi tidspunkt for symptomdebut. Dersom pasienten vaknet med symptom angis siste tidspunkt uten sypmtom, for eksempel ved leggetid
Dato | Måned | År | Timer | Min

Våknet pasienten med symptom på hjerneslag? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Innleggelsestidsunkt
Dato | Måned | År | Timer | Min

Hvor oppsto hjerneslaget?
☐ 1 Utenfor sykehus → Ble AMK/ambulanse varslet? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukj. → Transportmetode ☐ 1 Ambulanse ☐ 2 Luftambulanse ☐ 3 Kombinasjon ambulanse og luftambulanse ☐ 4 Annet → Ble pasienten innlagt via «trombolysealarm» eller tilsvarende prehospital varsling som er nødvendig for akutt utredning og trombolysebehandling? ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukj.
☐ 2 I sykehus, ikke prosedyrerelatert
☐ 3 I sykehus, prosedyrerelatert

Avdeling/enhet først innlagt?
☐ 1 Slagenhet (se veiledning)
☐ 2 Annen sengeavdeling → Hvilken avdeling? ☐ 1 Medisinsk ☐ 2 Nevro ☐ 3 Nevrokirurgi ☐ 4 Intensiv/ annen overvåkingsavd. ☐ 5 Observasjon ☐ 6 Annen

Overflyttet fra sykehus ☐ 1 Ja ☐ 2 Nei ☐ 9 Ukjent

Hvilket sykehus? _____

Dato overflyttet fra sykehus
Dato | Måned | År

Undersøkelser og tiltak utført under oppholdet

Bildediagnostikk av hjerneslaget

- ☐ 1 Ingen
- ☐ 2 CT
- ☐ 3 MRI
- ☐ 4 CT + MRI
- ☐ 5 Annen
- ☐ 9 Ukjent

Bildediagnostikk av ekstrakranielle kar

- ☐ 1 Ingen
- ☐ 2 Ultralyd
- ☐ 3 CT-angio
- ☐ 4 MR-angio
- ☐ 5 Komb. av flere
- ☐ 9 Ukjent

Bildediagnostikk av intrakranielle kar

- ☐ 1 Ingen
- ☐ 2 Ultralyd
- ☐ 3 CT-angio
- ☐ 4 MR-angio
- ☐ 5 Komb. av flere
- ☐ 9 Ukjent

Bildediagnostikk av hjerte

- ☐ 1 Ingen
- ☐ 2 Transthorakal ultralyd. Ecco cor
- ☐ 3 Transøsofageal ultralyd. Ecco cor
- ☐ 4 MRI
- ☐ 5 Kombinasjon av flere
- ☐ 6 Annen
- ☐ 9 Ukjent

Registrering av hjerterytme

- ☐ 1 Ingen
- ☐ 2 EKG
- ☐ 3 Telemetri/kontinuerlig EKG monitorering
- ☐ 4 Holtermonitorering
- ☐ 5 Kombinasjon av flere
- ☐ 9 Ukjent

Er fysiologisk homeostase kontrollert og behandlet i henhold til sjekkliste for pasientsikkerhetsprogrammet?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 3 Ikke relevant
- ☐ 9 Ukjent

Er svelgefunksjonen vurdert/testet?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 3 Ikke relevant
- ☐ 9 Ukjent

Er pasienten mobilisert ut av seng i løpet av de første 48 timer etter innleggelsen?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Er et gjennomført daglige skåringer med validert skårings-skjema for nevrologiske utfall de første tre døgn?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Har pasienten fått en tverrfaglig vurdering?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Utskriving

Utskrivingsdato

☐☐ Dato ☐☐ Måned ☐☐ År

Avdeling/enhet utskrevet fra?

- ☐ 1 Slagenhet (se veiledning)
- ☐ 2 Annen sengeavdeling

Hvilken avdeling?

- ☐ 1 Medisinsk
- ☐ 2 Nevrologisk
- ☐ 3 Nevrokirurgisk
- ☐ 4 Intensiv / annen overvåkingsavdeling
- ☐ 5 Observasjonsavdeling
- ☐ 6 Annen avdeling

Er pasienten behandlet i slagenhet i løpet av oppholdet?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Utskrives til

- ☐ 1 Egen bolig uten hjemmesykepleie/ hjemmehjelp
- ☐ 2 Egen bolig med hjemmesykepleie/ hjemmehjelp
- ☐ 3 Omsorgsbolig med døgnkontinuerlige tjenester
- ☐ 4 Sykehjem
- ☐ 5 Annen avdeling for videre behandling
- ☐ 6 Annen avd. i påvente av sykehjem/rehab.
- ☐ 7 Rehabiliteringsavdeling/-institusjon inkludert rehabilitering i sykehjem
- ☐ 8 Opptreningssenter
- ☐ 9 Ukjent
- ☐ 10 Død i løpet av oppholdet
- ☐ 11 Annet
- ☐ 12 Annet sykehus - spesifiser

Hvilken?

- ☐ 1 Rehabilitering i spesialisthelsetjenesten: offentlig institusjon
- ☐ 2 Rehabilitering i spesialisthelsetjenesten: privat institusjon med avtale
- ☐ 3 Rehabilitering i kommunehelsetjenesten: kommunal institusjon
- ☐ 4 Rehabilitering i kommunehelsetjenesten: privat institusjon med avtale

Er pasienten fulgt opp av et tverrfaglig team i forbindelse med utskriving fra sykehus?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 3 Ikke relevant
- ☐ 9 Ukjent

Hvis ja, sett ett kryss

- ☐ 1 Team organisatorisk tilknyttet sykehus
- ☐ 2 Team organisatorisk tilknyttet kommune

Har det ved utskriving blitt utført en funksjonsvurdering med funksjonsskår av pasienten?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Er pasienten vurdert med hensyn til sekundærprofylakse ved utskriving?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Har informasjon om røykestopp blitt gitt til de som er røykere?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Har informasjon blitt gitt om bilkjøring og eventuell karenstid?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Morsdato

☐☐ Dato ☐☐ Måned ☐☐ År

Obdusert?

- ☐ 1 Ja
- ☐ 2 Nei
- ☐ 9 Ukjent

Appendix 4. REK acceptance

REK
REGIONALE KOMITEER FOR MEDISINSK OG HELSEFAGLIG FORSKNINGSETIKK

Region:	Saksbehandler:	Telefon:	Vår dato:	Vår referanse:
REK nord	Lill Martinsen	77646140	05.12.2016	2015/171/REK nord
			Deres dato:	Deres referanse:
			10.10.2016	

Vår referanse må oppgis ved alle henvendelser

Ingvild Saltvedt
Olav Kyrresgt 17

2015/171 Kognitiv funksjon etter hjerneslag

Forskningsansvarlig institusjon: NTNU, Vestre Viken, Oslo universitetssykehus, Haukeland sykehus, St Olavs hospital, St Olavs hospital, Universtietetsykehuset i Nord-Norge
Prosjektleder: Ingvild Saltvedt

Vi viser til søknad om prosjektendring datert 10.10.2016 for ovennevnte forskningsprosjekt. Søknaden er behandlet av leder for REK nord på fullmakt, med hjemmel i helseforskningsloven § 11.

Søknad om prosjektendring av 10.10.16.
Prosjektet ønsker å undersøke om deltakere som inkluderes i Nor-COAST er representativ for hele slagpopulasjonen. For å få svar på dette vil prosjektet benytte data fra Norsk hjerneslagregister og sammenligne bakgrunnsinformasjon på de som er inkludert i Nor-COAST med tilsvarende data på de som ikke er inkludert. Prosjektet vil også søke slagregisteret om å få utlevert bakgrunnsdata på alle pasienter som har vært innlagt ved de deltagende sykehus med diagnosen akutt hjerneslag i den aktuelle tidsperioden.

I etterfølgende kontakt med prosjektleder har man kommet fram til en løsning der personnummer på deltakere i studien utleveres til Norsk slagregister, slik at registeret kan trekke ut disse fra omsøkte datasett og utleverer omsøkte data i avidentifisert form er hensiktsmessig.

Vedtak
Med hjemmel i helseforskningsloven § 11, godkjennes prosjektendringen. Forutsetningene er at innhenting av data gjøres iht. veiledning fra REK.

Klageadgang
Du kan klage på komiteens vedtak, jf. forvaltningsloven § 28 flg. Klagen sendes til REK nord. Klagefristen er tre uker fra du mottar dette brevet. Dersom vedtaket opprettholdes av REK nord, sendes klagen videre til Den nasjonale forskningsetiske komité for medisin og helsefag for endelig vurdering.

Med vennlig hilsen

May Britt Rossvoll
Sekretariatsleder

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