Guideline Adherence of Antithrombotic Treatment Initiated by General Practitioners in Patients With Nonvalvular Atrial Fibrillation: A Danish Survey

Background: The aim of this prospective survey was to describe the demographics, stroke risk profile, and the guideline adherence of antithrombotic treatment in a Danish primary care population of patients with nonvalvular atrial fibrillation (AF). Hypothesis: We hypothesized that a significant proportion of patients with nonvalvular AF do not receive guideline-adherent antithrombotic treatment in primary care. Methods: We performed a cross-sectional survey of antithrombotic treatment using data of AF patients from general practices. Results: Sixty-four general practitioners enrolled 1743 patients with a mean age of 74.8 ± 11.2 years. The mean CHADS(2) and CHA(2)DS(2)-VASc scores were 1.9 ± 1.3 and 3.5 ± 1.8, respectively. Of the patients, 12.4% and 4.04%, respectively, were at truly low risk, with a CHADS(2) and CHA(2)DS(2)-VASc score 0 (P < 0.001). A score of 1 was seen in 28.0% vs 9.0% (P < 0.001) of the patients. Of all patients, 66.3% were treated with oral anticoagulants, 18.7% with antiplatelet drugs only, and 15% received no antithrombotic therapy. Based on the CHADS(2) score, 75.7% of the patients were treated in adherence with the guidelines, 16% were undertreated, and 8.4% overtreated. The corresponding numbers for the CHA(2)DS(2)-VASc score were 75.4%, 22.7%, and 1.8%, respectively. The differences in guideline adherence applying the 2 scores were significant (P < 0.001). Of patients receiving no antithrombotic therapy, 64.1% were treated in adherence to the guidelines according to the CHADS(2) score. Applying the CHA(2)DS(2)-VASc score, this proportion was only 53.4%. Antiplatelet drug treatment was in adherence to the guidelines (CHADS(2) and CHA(2)DS(2)-VASc score of 1) in only 31% and 12% of the patients, respectively. Conclusions: Antithrombotic treatment of AF patients is in general well performed in primary care in Denmark. Further improvements may be achieved by thorough stroke risk stratification on the basis of current evidence-based guidelines.
Detection of previously undiagnosed cases of COPD in a high-risk population identified in general practice.

Background and Aim: Under-diagnosis of COPD is a widespread problem. This study aimed to identify previously undiagnosed cases of COPD in a high-risk population identified through general practice. Methods: Participating GPs (n = 241) recruited subjects with no previous diagnosis of lung disease, >35 yrs, and at least one respiratory symptom. Age, smoking status, pack-years, BMI, dyspnoea score (MRC), and pre-bronchodilator spirometry data was obtained. Subjects with airway obstruction (FEV1/FVC ≤ 0.7) at initial spirometry were tested for reversibility, according to Danish COPD guidelines, with bronchodilator and, if necessary, corticosteroids in order to confirm a diagnosis of COPD. Results: A total of 4,049 (49% females) subjects were included; mean age 58 yrs, BMI 27, and 32 pack-years. The COPD prevalence was 21.7%; 8.3% in subjects younger than 48 years. Most patients were classified in GOLD stages I and II (36% and 50%,...
The number needed to screen (NNS) for a new diagnosis of COPD was 4.6. COPD diagnosis was related to gender, age, BMI (p <0.001), pack-years, and cough (p <0.001), wheezing (p <0.001) and sputum production (p = 0.002). A threshold of 10% pre-test risk of COPD would have reduced the number of spirometry tests by 35% although 90% of the patients with COPD would still have been identified (NNS 3.9). Conclusions: Of the at-risk subjects studied, 22% were diagnosed with COPD. A case-finding strategy providing questionnaire assessment and diagnostic spirometry to high-risk subjects in primary care, and therefore, identifies a large proportion of undiagnosed COPD patients, especially in the early stages of the disease.

General information

State: Published
Organisations: Department of Informatics and Mathematical Modeling, Mathematical Statistics, Algorithms and Logic, DTU Data Analysis, Aarhus University, Boehringer Ingelheim Danmark A/S, Pfizer Aps, Copenhagen University Hospital
Authors: Løkke, A. (Ekstern), Ulrik, C. S. (Forskerdatabase), Dahl, R. (Forskerdatabase), Plauborg, L. (Ekstern), Dollerup, J. (Ekstern), Kristiansen, L. C. (Intern), Cording, P. H. (Intern), Dehlendorff, C. (Intern)
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Scopus rating (2012): SJR 1.368 SNIP 1.157 CiteScore 2.36
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Web of Science (2012): Indexed yes
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ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 1.228 SNIP 0.804
Scopus rating (2009): SJR 0.978 SNIP 0.704
Scopus rating (2008): SJR 1.111 SNIP 0.698
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Is Barthel index a relevant measure for measuring prevalence of urinary incontinence in stroke patients?

To compare the prevalence of urinary incontinence (UI) measured by Barthel Index and the Danish Prostate Symptom Score (DAN-PSS-1) questionnaire in stroke patients. A cross-sectional, hospital based survey was initiated whereby 407 stroke patients, average age 67 (SD 12) years with a mean interval of 101 days since onset of last stroke at inclusion. The stroke patients self-reported the prevalence of UI by Barthel Index and the DAN-PSS-1 questionnaire. The prevalence of UI was 10.5% measured by the Barthel Index and 49% by the DAN-PSS-1 questionnaire. Furthermore, the DAN-PSS-1 questionnaire distinguished between types of UI (38% urge UI, 28% stress UI, and 14% other UI). There were significantly fewer stroke patients who reported UI by the Barthel Index compared to the DAN-PSS-1 questionnaire. The results showed that DAN-PSS-1 questionnaire contains more specific UI information compared to the Barthel Index. Fewer stroke patients reported UI by the Barthel Index compared to the DAN-PSS-1 questionnaire and moreover the DAN-PSS-1 questionnaire enables identification of different UI-types. The Barthel Index is not sensitive to the UI prevalence; instead the authors suggest using a more specific instrument such
as the DAN-PSS-1 questionnaire.

**General information**

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Organisations: DTU Data Analysis, Department of Informatics and Mathematical Modeling, Copenhagen University Hospital
Authors: Tibaek, S. (Ekstern), Dehlendorff, C. (Intern)
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BFI (2014): BFI-level 1
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BFI (2013): BFI-level 1
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Scopus rating (2012): SJR 1.152 SNIP 1.393 CiteScore 2.33
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BFI (2010): BFI-level 1
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BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.679 SNIP 1.444
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.261 SNIP 1.237
Scopus rating (2007): SJR 1.314 SNIP 1.634
Scopus rating (2006): SJR 1.099 SNIP 1.555
Scopus rating (2005): SJR 1.607 SNIP 2.314
Scopus rating (2004): SJR 1.77 SNIP 2.257
Scopus rating (2003): SJR 1.543 SNIP 2.054
Scopus rating (2002): SJR 1.277 SNIP 1.419
Scopus rating (2001): SJR 1.068 SNIP 1.348
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**Designing simulation experiments with controllable and uncontrollable factors for applications in healthcare**

We propose a new methodology for designing computer experiments that was inspired by the split-plot designs that are often used in physical experimentation. The methodology has been developed for a simulation model of a surgical unit in a Danish hospital. We classify the factors as controllable and uncontrollable on the basis of their characteristics in the physical system. The experiments are designed so that, for a given setting of the controllable factors, the various settings of the uncontrollable factors cover the design space uniformly. Moreover the methodology allows for overall uniform coverage in the combined design when all settings of the uncontrollable factors are considered at once.

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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Dehlendorff, C. (Intern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
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**Is well-being associated with lower urinary tract symptoms in patients with stroke?**

Objective. This study aimed to assess self-reported well-being in a clinical sample of stroke patients and to identify possible associations with prevalence, severity and bother of lower urinary tract symptoms (LUTS). Material and methods. A cross-sectional, clinical survey was initiated whereby stroke patients were invited to complete The WHO-Five Well-Being Index (WHO-5) and a LUTS instrument, the Danish Prostatic Symptom Score (DAN-PSS-1) questionnaire. Of 519 stroke patients invited, 482 subjects were eligible and 407 (84%) respondents answered the questionnaires. Results. Poor well-being (sum score <13) was reported by 22% of all stroke patients, for women 29% and for men 14%. Depression (sum score <8) was reported by 10%, for women 11% and for men 8%. Poor well-being was significantly (p <0.01) associated with severity and bother of LUTS. Likewise, poor well-being was significantly (p <0.001) associated with the prevalence of four different symptom groups of LUTS. Conclusions. The results indicate that poor well-being is present in stroke patients with LUTS, especially in women. Likewise, the data showed significant association between poor well-being and LUTS. Screening for well-being and LUTS in stroke patients is strongly recommended.

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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Lund University, Copenhagen University Hospital
Authors: Tibaek, S. (Ekstern), Dehlendorff, C. (Intern), Iversen, H. K. (Ekstern), Klarskov, P. (Ekstern), Gard, G. (Ekstern), Jensen, R. (Ekstern)
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Main Research Area: Technical/natural sciences

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Design of Computer Experiments
The main topic of this thesis is design and analysis of computer and simulation experiments and is dealt with in six papers and a summary report. Simulation and computer models have in recent years received increasingly more attention due to their increasing complexity and usability. Software packages make the development of rather complicated computer models using predefined building blocks possible. This implies that the range of phenomena that are analyzed by means of a computer model has expanded significantly. As the complexity grows so does the need for efficient experimental designs and analysis methods, since the complex computer models often are expensive to use in terms of computer time. The choice of performance parameter is an important part of the analysis of computer and simulation models and Paper A introduces a new statistic for waiting times in health care units. The statistic is a measure of the extent of long waiting times, which are known both to be the most bothersome and to have the greatest impact on patient satisfaction. A simulation model for an orthopedic surgical unit at a hospital illustrates the benefits of using the measure. Another important consideration in connection to simulation models is the design of experiments, which is the decision of which of the possible configurations of the simulation model that should be tested. Since the possible configurations are numerous and the time to test a single configuration may take minutes or hours of computer time, the number of configurations that can be tested is limited. Papers B and C introduce a novel experimental plan for simulation models having two types of
input factors. The plan differentiates between factors that can be controlled in both the simulation model and the physical system and factors that are only controllable in the simulation model but simply observed in the physical system. Factors that only are controllable in the simulation model are called uncontrollable factors and they correspond to the environmental factors in fluencing the physical system. Applying the experimental framework on the simulation model in Paper A shows that the effects of changes in the uncontrollable factors are better understood with the proposed design compared to the alternative and commonly used methods. In papers D and E a modeling framework for analyzing simulation models with multiple noise sources is presented. It is shown that the sources of variation of the simulation model can be divided in two components corresponding to changes in the environmental factors (the uncontrollable factor settings) and to random variation. Moreover, the structure of the environmental effects can be estimated, which can be used to put the system in a more robust operating mode. The interpolation technique called Kriging is the topic of Paper F, which is a widely applied technique for building so called models-for-the-model (metamodels). We propose a method that handles both qualitative and quantitative factors, which is not covered by the standard model. Fitting the final Kriging model is done in two stages each based on fitting regular Kriging models. It is shown that this method works well on a realistic example such as a simulation model for a surgical unit.

**General information**

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Authors: Dehlendorff, C. (Intern), Andersen, K. K. (Intern), Kulahci, M. (Intern)  
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**Analysis of Computer Experiments with Multiple Noise Sources**

In this paper we present a modeling framework for analyzing computer models with two types of variations. The paper is based on a case study of an orthopedic surgical unit, which has both controllable and uncontrollable factors. Our results show that this structure of variation can be modeled effectively with linear mixed effects models and generalized additive models. Copyright (C) 2009 John Wiley & Sons, Ltd.
Conditional Value at Risk as a Measure for Waiting Time in Simulations of Hospital Units

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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Dehleddorff, C. (Intern), Kulahci, M. (Intern), Merser, S. (Ekstern), Andersen, K. K. (Intern)
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Kriging in computer experiments

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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Dehendorff, C. (Intern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
Publication date: 2010
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Scopus rating (2016): SJR 1.214 SNIP 1.573 CiteScore 1.41
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BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.684 SNIP 2.027 CiteScore 1.49
BFI (2013): BFI-level 2
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Predictors of outcome of the treatment programme in a multidisciplinary headache centre

General information
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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Copenhagen University Hospital
Authors: Jensen, R. (Ekstern), Zeeberg, P. (Ekstern), Dehlendorff, C. (Intern), Olesen, J. (Ekstern)
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.004 SNIP 2.69 CiteScore 3.87
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Scopus rating (2014): SJR 1.82 SNIP 1.837 CiteScore 3.26
Are activity limitations associated with lower urinary tract symptoms in stroke patients? A cross-sectional, clinical survey

Objective. To assess self-reported activity limitations in a clinical sample of stroke patients and to identify their association with prevalence, severity and impact on daily life of lower urinary tract symptoms (LUTS). Material and methods. A cross-sectional, clinical survey was initiated whereby stroke patients were invited to complete four activity limitations measurements: Barthel Index, mobility velocity, mobility distance, mobility aids and one LUTS measurement: the Danish Prostatic Symptom Score (DAN-PSS-1) questionnaire. Of 519 stroke patients, 482 subjects were eligible. Results. The response rate was 84%. The activity limitations were reported by 17-34% depending on the measurement. Mobility velocity was highly significantly associated (p=0.01) with severity of LUTS. In the LUTS incontinence symptom group, Barthel Index and mobility velocity were significantly associated with prevalence [p=0.03, odds ratio (OR) 2.08 and p=0.05, OR 1.87, respectively]. Barthel Index and mobility distance were also associated with severity (p=0.03 and p=0.04, respectively) and Barthel Index was associated with the prevalence of bother (p=0.02, OR 2.12). Conclusion. This study indicate for the first time that activity limitations are closely related to LUTS in stroke patients and that rehabilitation should also be directed towards the treatment of LUTS.

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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Lund University, Copenhagen University Hospital
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Main Research Area: Technical/natural sciences
Design and Analysis of Simulation Experiments

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Dehlendorff, C. (Intern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
Designing Simulation Experiments with Controllable and Uncontrollable Factors

In this study we propose a new method for designing computer experiments inspired by the split plot designs used in physical experimentation. The basic layout is that each set of controllable factor settings corresponds to a whole plot for which a number of subplots, each corresponding to one combination of settings of the uncontrollable factors, is employed. The caveat is a desire that the subplots within each whole plot cover the design space uniformly. A further desire is that in the combined design, where all experimental runs are considered at once, the uniformity of the design space coverage should be guaranteed. Our proposed method allows for a large number of uncontrollable and controllable settings to be run in a limited number of runs while uniformly covering the design space for the uncontrollable factors.

Hemorrhagic and Ischemic Strokes Compared Stroke Severity, Mortality, and Risk Factors

Background and Purpose-Stroke patients with hemorrhagic (HS) and ischemic strokes were compared with regard to stroke severity, mortality, and cardiovascular risk factors. Methods-A registry started in 2001, with the aim of registering all hospitalized stroke patients in Denmark, now holds information for 39 484 patients. The patients underwent an evaluation including stroke severity (Scandinavian Stroke Scale), CT, and cardiovascular risk factors. They were followed-up from admission until death or censoring in 2007. Independent predictors of death were identified by means of a survival model based on 25 123 individuals with a complete data set. Results-Of the patients 3993 (10.1%) had HS. Stroke severity was almost linearly related to the probability of having HS (2% in patients with the mildest stroke and 30% in those with the most severe strokes). Factors favoring ischemic strokes vs HS were diabetes, atrial fibrillation, previous myocardial infarction, previous stroke, and intermittent arterial claudication. Smoking and alcohol consumption favored HS, whereas age, sex, and hypertension did not herald stroke type. Compared with ischemic strokes, HS was associated with an overall higher mortality risk (HR, 1.564; 95% CI, 1.441-1.696). The increased risk was, however, time-dependent; initially, risk was 4-fold, after 1 week it was 2.5-fold, and after 3 weeks it was 1.5-fold. After 3 months stroke type did not correlate to mortality. Conclusion-Strokes are generally more severe in patients with HS. Within the first 3 months after stroke, HS is associated with a considerable increase of mortality, which is specifically associated with the hemorrhagic nature of the lesion. (Stroke. 2009; 40: 2068-2072.)
The Female Stroke Survival Advantage: Relation to Age

Background: Age-related hormonal factors are thought to be related to the gender gap in longevity. Testing the hypothesis that survival is best in young premenopausal women we studied the effect of age on 1-week mortality in stroke patients.

Methods: A registry was started in 2001 with the aim of registering all hospitalized patients in Denmark. The patients' risk factors, stroke severity and CT scan were evaluated. A total of 25,607 patients (63%) gave complete information on all risk factors and were used in the analysis. Independent predictors of survival were identified by means of multiple logistic regression. Results: The probability of death within 1 week adjusted for stroke severity, stroke type and risk factors was highly age-dependent in both men and women. Up to the age of 50 years, the 1-week female/male mortality rates paralleled being slightly (15%) but insignificantly better in women. While mortality increased almost linearly in women over the entire age range, it increased steeply in men from the age of 50 and at the age of 80 years survival was 80% better in women. Conclusion: The female stroke survival advantage applies to all ages. It increases with age due to a steeply increase of mortality in middle-aged and elderly men.

General information
Validity of the Danish Prostate Symptom Score questionnaire in stroke

Objective – To determine the content and face validity of the Danish Prostate Symptom Score (DAN-PSS-1) questionnaire in stroke patients. Materials and methods – Content validity was judged among an expert panel in neuro-urology. The judgement was measured by the content validity index (CVI). Face validity was indicated in a clinical sample of 482 stroke patients in a hospital-based, cross-sectional survey. Results – I-CVI was rated >0.78 (range 0.94–1.00) for 75% of symptom and bother items corresponding to adequate content validity. The expert panel rated the entire DAN-PSS-1 questionnaire highly relevant (S-CVI = 1.00). No experts suggested items omitted or improved. The response rate was 84% and face validity had an acceptable level of completed response for each symptom items (96–98%) and bother items (93–96%) indicating that all items were well interpreted. Conclusion – The DAN-PSS-1 questionnaire appears to be content and face valid for measuring lower urinary tract symptoms after stroke.

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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Copenhagen University Hospital
Authors: Tibaek, S. (Ekstern), Dehlendorff, C. (Intern)
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.442 SNIP 1.013 CiteScore 2.45
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.495 SNIP 1.027 CiteScore 2.38
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.684 SNIP 1.085 CiteScore 2.13
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.29 SNIP 1.131 CiteScore 2.34
ISI indexed (2013): ISI indexed yes
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BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.371 SNIP 1.007 CiteScore 2.16
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ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.313 SNIP 1.083
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.869 SNIP 1.101
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.82 SNIP 1.208
Scopus rating (2007): SJR 0.579 SNIP 0.805
Scopus rating (2006): SJR 1.566 SNIP 1.821
Scopus rating (2005): SJR 1.12 SNIP 1.794
Scopus rating (2004): SJR 1.312 SNIP 1.168
Body mass index and poststroke mortality

Background: Obesity is an established cardiovascular risk factor. We studied the association between body mass index (BMI) and all-cause mortality after stroke. Methods: A registry started in 2001 with the aim to register all hospitalized stroke patients in Denmark now includes 21,884 patients in whom BMI was recorded. There are five BMI groups: underweight (BMI <18.5), normal weight (BMI 18.5-24.9), overweight (BMI 25.0-29.9), obese (BMI 30.0-34.9) and severely obese (BMI 6 35). All patients underwent an evaluation including stroke severity, computed tomography, and cardiovascular risk factors. Survival was followed up to 5 years after stroke (median 1.5 years). Independent predictors of death were identified by means of a survival model based on 13,242 individuals with a complete data set. Results: Compared to normal-weight patients, mortality was lower in overweight [hazard rate (HR) 0.73, 95% CI 0.66-0.81], obese (HR 0.84, 95% CI 0.73-0.98) and severely obese stroke patients (HR 0.84, 95% CI 0.64-1.10), while mortality was higher in underweight patients (HR 1.63, 95% CI 1.41-1.90). Conclusions: Poststroke mortality is inversely related to BMI: overweight and obese stroke patients have a lower poststroke mortality rate than normal-weight and underweight patients.
Body mass index, cholesterol level and poststroke mortality - Reply

General information
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Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
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BFI (2014): BFI-level 1
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BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.312 SNIP 1.258 CiteScore 2.48
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BFI (2012): BFI-level 1
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Designing Simulation Experiments with Controllable and Uncontrollable Factors

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Authors: Dehendorff, C. (Intern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
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Main Research Area: Technical/natural sciences
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Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2008

Designing Simulation Experiments with Controllable and Uncontrollable Factors

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Mathematical Statistics
Authors: Dehendorff, C. (Intern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
Publication date: 2008
Host publication information
Title of host publication: Proceedings of Winter Simulation Conference
Main Research Area: Technical/natural sciences
Conference: 2008 Winter Simulation Conference, Miami, FL, United States, 07/12/2008 - 07/12/2008
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Prevalence of Lower Urinary Tract Symptoms (LUTS) in Stroke Patients. A cross-sectional, clinical survey

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Tibæk, S. (Ekstern), Gard, G. (Ekstern), Klarskov, P. (Ekstern), Iversen, H. K. (Ekstern), Dehlendorff, C. (Intern), Jensen, R. H. (Ekstern)
Pages: 763-771
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Main Research Area: Technical/natural sciences

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Journal: Neurology and Urodynamics
Volume: 27
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Simulation and Optimization of an Orthopaedic Surgical Unit

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Mathematical Statistics, University of Copenhagen
Authors: Dehlendorff, C. (Intern), Merser, S. (Ekstern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
Publication date: 2008
Event: Poster session presented at Danish Orthopedic Society : Spring Meeting, .
Main Research Area: Technical/natural sciences
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Publication: Research › Poster – Annual report year: 2008

Simulation Experimentation in Health Care Applications

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Dehlendorff, C. (Intern), Kulahci, M. (Intern), Andersen, K. K. (Intern)
Publication date: 2008
Event: Abstract from 8th European Network for Business and Industrial Statistics Conference, Athens, Greece.
Main Research Area: Technical/natural sciences
Source: orbit
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Publication: Research › Conference abstract for conference – Annual report year: 2008

Combining Latin Hypercube Designs and Discrete Event Simulation in a Study of a Surgical Unit

Summary form given only:In this article experiments on a discrete event simulation model for an orthopedic surgery are considered. The model is developed as part of a larger project in co-operation with Copenhagen University Hospital in Gentofte. Experiments on the model are performed by using Latin hypercube designs. The parameter set consists of system settings such as use of preparation room for sedation and the number of operating rooms, as well as management decisions such as staffing, size of the recovery room and the number of simultaneously active operating rooms. Sensitivity analysis and optimization combined with meta-modeling are employed in search for optimal setups. The primary objective in this article is to minimize time spent by the patients in the system. The overall long-term objective for the orthopedic surgery unit is to minimize time lost during the pre- and post operation activities for acute and elective surgery as well as dedicated elective surgery.

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Dehlendorff, C. (Intern), Andersen, K. K. (Intern), Kulahci, M. (Intern)
Publication date: 2007
Sex-related time-dependent variations in post-stroke survival—evidence of a female stroke survival advantage

Background: Women live longer than men, yet most studies show that gender has no influence on survival after stroke. Methods: A registry was started in 2001, with the aim of registering all hospitalized stroke patients in Denmark, and it now holds 39,484 patients of which 48% are female. We studied the influence of gender on post-stroke mortality, from the time of admission through the subsequent years until death or censoring (mean follow-up time: 538 days). All patients underwent an evaluation including stroke severity, computed tomography and cardiovascular risk factors. Independent predictors of death were identified by means of a survival model based on 22,222 individuals with a complete data set.

Results: Females were older and had severer stroke. Interestingly, the risk of death between genders was time dependent. The female/male stroke mortality rate favoured women from the first day of stroke and remained so during the first month suggesting a female survival advantage. Throughout the second month the rate reversed in favour of men suggesting that women in that period are paying a ‘toll’ for their initial survival advantage. Hereafter, the rate steadily decreased, and after 4 months women continued to have the same low risk as in the first week. Conclusions: Our study suggests a female superiority in stroke survival competence.
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BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.333 SNIP 1.021
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.536 SNIP 1.027
Web of Science (2007): Indexed yes
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Projects:

Robust biomarkers for detection of cancer
Department of Applied Mathematics and Computer Science
Period: 04/08/2015 → 15/08/2015
Number of participants: 4
Phd Student:
Freltoft, Alexandra Rohde O'Sullivan (Intern)
Supervisor:
Dehlendorff, Christian (Intern)
Stenvang, Jan (Ekstern)
Main Supervisor:
Kulahci, Murat (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Statistical design and analysis of animal experiments
Department of Applied Mathematics and Computer Science
Period: 15/09/2008 → 25/09/2014
Number of participants: 5
Phd Student:
Hansen, Merete Kjær (Intern)
Main Supervisor:
Kulahci, Murat (Intern)
Examiner:
Brockhoff, Per B. (Intern)
Dehlendorff, Christian (Intern)
Vining, G. Geoffrey (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Design of computer experiments
Department of Informatics and Mathematical Modeling
Period: 01/03/2007 → 08/12/2010
Number of participants: 6
PhD Student:
Dehlendorff, Christian (Intern)
Supervisor:
Kulahci, Murat (Intern)
Main Supervisor:
Andersen, Klaus Kaae (Intern)
Examiner:
Nielsen, Bo Friis (Intern)
Lophaven, Søren Nymand (Intern)
Tyssedal, John (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-lønnet stipendie
Project: PhD