

ANNUAL REPORT

2021

Research Center for Emergency Medicine



Data sheet

Annual Report 2021 – Research Center for Emergency Medicine

The annual report is composed and published in cooperation with researchers and colleagues affiliated to Research Center for Emergency Medicine.

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Preface

Dear Colleague,

Again, in this annual report 2021, we want to expose you for the spirit and the activities in Research Center for Emergency Medicine. On the first pages, we give a short background information about who we are, what we strive for, how we work and how we see Emergency Medicine.

On the following pages, we list our academic program and activities. You can also follow us on [facebook](#), [Twitter](#) and [Linkedin](#).

Despite the COVID-19 pandemic, we are proud to say that we managed to keep together and even increase our productivity.

We are always looking for new researchers and collaborators, do not hesitate to contact us even for a short chat, or a cup of coffee if you are in the neighbourhood.

Finally, I want to thank all our friends and colleagues, national as well as international, for the good collaboration throughout the year.

Best regards

Professor

Hans Kirkegaard

A handwritten signature in black ink that reads "Hans Kirkegaard". The script is cursive and fluid, with the first letters of the first and last names being capitalized and prominent.

Contents

1. About us - Research Center for Emergency Medicine	1
2. Mission, vision and strategy	1
3. Research philosophy.....	3
4. The field of emergency medicine.....	3
5. Academic programme, publications and foundation grants.....	4
6. Current national research projects.....	9
7. Current international research projects	10
8. Peer review publications	10
9. Book chapter.....	18
10. Invited international lectures and presentations.....	18
11. Invited national lectures and presentations.....	18
12. International cooperation.....	18
13. Review committee assessments	20
14. Grants and funding	21
15. Awards	21

1. About us - Research Center for Emergency Medicine

We are the centre for research in emergency medicine at Aarhus University Hospital, Aarhus University and in Central Denmark Region, established to initiate and stimulate research in this newly implemented medical speciality in Denmark.

In house, at Aarhus University Hospital, the centre is affiliated with the emergency department and the research environment is occupied by all academic positions, from bachelor students and PhD students to clinicians, established researchers, and professors.

By embracing various healthcare professions and research methods, we strive to reflect the interdisciplinary nature of emergency medicine in our research activities. Many of our research activities are structured in networks that also welcome researchers based in other specialities, locations or faculties.

We provide an excellent research environment and aim to establish new collaborators and projects continuously within the research field of emergency medicine.

2. Mission, vision and strategy

Mission Statement

We perform interdisciplinary research with international impact in favour of patients with acute illness.

Mission

Research Center for Emergency Medicine generates and conveys research within all aspects of emergency medicine in favour of patients with acute illness and the medical speciality of emergency medicine.

Our research is interdisciplinary and multidisciplinary and includes all academic positions from student to professor from different faculties. Our center is the driving force and leading knowledge base for emergency medicine research in the Central Denmark Region, and a natural gathering point for both established and early career researchers within the field. Our research environment is based on values of tolerance, diligence, diversity, cooperation, and talent development.

Vision

Research Center for Emergency Medicine (RECEM) is nationally leading and internationally acclaimed within the research field of emergency medicine.

RECEM is a gathering point and driving force for emergency medicine research in the Central Denmark Region

RECEM demonstrates a high quality of research and our articles are published in high-impact scientific journals

RECEM is well known among medical professionals, academics, and the general public

RECEM has a strong international, interdisciplinary, and multidisciplinary profile

RECEM has an established collaborative network and attracts both talented early career and established researchers nationally as well as internationally

RECEM develop and provide pre- and postgraduate education in the field of emergency medicine at an international level

RECEM develops and initiates research projects that are awarded grants on a continuous basis from both national, international, private, and public funding sources

RECEM has a research culture firmly anchored in the emergency department where all patients are included in research or quality-improvement projects

Strategy 2022

Academic staff

The academic staff will be strengthened at all academic levels within the profession of health care.

Management structure

The professor in Emergency Medicine is research leader and the overall responsible. An associate professor in Emergency Medicine is director of RECEM. A flat organizational structure, with a democratic, equal, and open culture, is maintained.

Organisation of research

The research organisation of RECEM is based on the establishment of research networks, read more about how we are organised in the paragraph "Research Philosophy" below.

Focus areas

- Early and effective diagnostics and treatment
- Life-saving treatment
- Patient-flow and transition across sectors
- Patient safety
- Organisational conditions
- The vulnerable patient
- Involvement of patients and relatives
- Pain management
- Sepsis
- Point-of-Care ultrasound

The research environment

RECEM promotes an inspiring research environment and brings talent development, staff retention, and an international vision into focus. RECEM is a multidisciplinary and interdisciplinary research centre where research and the quality of research is prioritized over the academic level, line of profession, and level of education.

Visibility and presentation

Presentation of the results of each research project must be clear and distinct. We aim to publish our results in high-impact international scientific journals. Furthermore, we strive to disseminate our research to a wide audience including both professional stakeholders and the broad public.

Teaching

We strive to establish teaching in emergency medicine to be at same level as other medical specialities.

We give priority to teaching in all aspects of emergency medicine regardless of profession, level of education, and department.

Research qualifications

RECEM strives to develop expertise in interventional-, qualitative-, epidemiological, and simulation research.

Cooperation

RECEM collaborates at a regional, national, and international level.

RECEM collaborates across a wide range of (academic) disciplines at the hospital and university.

Fundraising

We seek to obtain financial resources for ongoing and future research projects at a continuous basis.

3. Research philosophy

Our research philosophy is based on the establishment of research networks. A research network is a group of researchers with similar interests. The head of research at RECEM presides over the respective networks; however, the networks are autonomic and driven forward by key researchers. Researchers from other research environments are also linked to and welcome in the networks, which is why we represent a unique interdisciplinary field within the individual research fields.

4. The field of emergency medicine

The field of emergency medicine is concerned with the care of illness or injuries requiring acute medical attention. It embraces all aspects of the acute patient's treatment from the first contact to the emergency service to hospitalisation and rehabilitation after discharge. Emergency medicine cuts across existing professional and organizational boundaries and has a wide interface of different clinical and epidemiological fields.

In Denmark the emergency departments have existed for several years now, and in 2017 emergency medicine was finally approved as a medical speciality.

5. Academic programme, publications and foundation grants

Overview

Professors	2
Associated professors	3
Postdoc	1
PhD degrees	2
PhD students	22
Research year students	1
Master thesis students	11
Research training students	2
Bachelor students	1
Per review publications	68
Grants	DKK 1.548.640

Hans Kirkegaard, professor

PhD Students, main supervisor

Marie Kristine Jessen

Fluid administration in adult emergency department patients with sepsis

Martin Gude (The prehospital EMS program)

Improvement and evaluation of prehospital stroke management

PhD Students, co-supervisor

Kasper Glerup Lauridsen

Improving outcomes from in-hospital cardiac arrest: studies on cardiac arrest teams

Main supervisor Bo Løfgren

Defence 28 May 2021

Stine Fjendbo Galili

Management of acute pain in patients using opioids

Main supervisor Lone Nikolajsen

PhD Students, co-supervisor

Prehospital Emergency Medical Services, the Central Denmark Region

Sophie Seidenfaden

The potential of novel biomarkers in prehospital management of traumatic brain Injury

Main supervisor Morten Bøtger

Mikael Fink Vallentin

Calcium for Out-of-Hospital Cardiac Arrest – A Randomized, Double-Blind, Placebo-Controlled Trial

Main supervisor Lars Wiuff Andersen

Jesper Fjølner

Hemodynamic-directed cardiopulmonary resuscitation in out-of-hospital cardiac arrest: The HEROIC study

Main supervisor Steffen Christensen

Research Year Students, main supervisor

Frederik Trier

Trauma patients at Aarhus University Hospital from the year 2000 to 2020

Defence August 2021

Master Thesis, main supervisor

Frederik Trier

Trauma patients at Aarhus University Hospital from the year 2000 to 2020

Cathrine Præst Mose

Altered mental status in Danish Emergency department patients: Etiologies and outcomes

Marie Egebjerg

The effect of prehospital transportation to the emergency department on 24-hour fluid treatment of patients with suspected infection

Maria Krusenstjerna-Hafstrøm

Acute pain treatment of children in the Danish Emergency Departments: A nationwide cross-sectional study

Marie Schmidt-Rasmussen Nielsen

Performance of Danish Emergency Process Triage in patients with abdominal pain

Bachelor student, main supervisor

Rasmus Rye Søndergaard

Trauma score

Defence February 2021

Research training students, main supervisor

Marie Schmidt-Rasmussen Nielsen

Performance of Danish Emergency Process Triage in patients with abdominal pain

Cathrine Præst Mose

Altered mental status in Danish Emergency department patients: Etiologies and outcomes

Administrative officer and professor secretary

Ida Katrine Thomsen

Bo Løfgren, professor

PhD students, main supervisor

Anders Sjørlev Schmidt

Improving the Efficiency and Safety of Direct Current Cardioversion

Defence 9 April 2021

Kasper Glerup Lauridsen

Improving outcomes from in-hospital cardiac arrest: studies on cardiac arrest teams

Defence 28 May 2021

Mathilde Stærk

Improving the first five minutes of resuscitation after in-hospital cardiac arrest

Defence expected 2022

Sandra Langsted

Ultra sound guided thoracentesis in the Emergency Department – training and clinical performance

Lene Holst Andersen

Improving communication skills for residents performing Geriatric Ward Rounds – a mixed method study

PhD Students, co-supervisor

Hannah Brogård Andersen

Circulatory support in neonatal resuscitation

Main supervisor Tine Brink Henriksen

Frederik Boe Hansen

Improving Cerebral Perfusion and Neuronal Outcome in the Post-Cardiac Arrest Period

Main supervisor Asger Granfeldt

Maria Festila

Exploring Entanglements of Infrastructures and Healthcare: The Context of Critical Care Medicine

Main supervisor Sune Dueholm Müller (BSS)

Lauge Vammen

Clinically relevant cardiac arrest survival model and intervention with thiamine

Main supervisor Asger Granfeldt

Stig Holm Ovesen

Focused Lung Ultrasound and Pneumonia in the Emergency Department

Main supervisor Jesper Weile

Master Thesis, supervisor

Sofie Rødtne Markussen

Patienters oplevelse af DC-konvertering ved brug af henholdsvis midazolam eller propofol som bedøvelse: Et kohortestudie

Sofie Paarup Thomsen

Pacemakere testet efter DC-konvertering: Et kohortestudie

Marianne Lisby, associate professor

PhD students, main supervisor

Trine Worm Thøgersen, MHSc

Preventable acute hospital admissions – terminology, characteristics, and development of an assessment tool for community-based nurses

Tine Louise Dideriksen, MHSc Nurs

GAME CHANGER, A novel way to approach patients suffering from alcohol use disorder: development and (pilot) test of an intervention linking patients and systems

Master Thesis, main supervisor

Line Hansen, stud. med.

Can discharge diagnoses predict readmissions in patients presenting to the emergency department with chief complaint "fever/infection"

Pernille Dyhrberg, stud. MHSc

The association between acute hospital admission and drug treatment

Master Thesis, co-supervisor

Sara Viskum Leth, stud. scient. publ.

Patients with repeated acute admissions: sociodemographic characteristics, illness, and contact with primary healthcare sector – a retrospective matched cohort study.

Karina Andresen, stud. MHSc

The association between medication errors in nursing homes working with the Danish concept "I sikre hænder" and nursing homes that have not

Research Project in the Emergency Department, main supervisor

Mia Blaabjerg, MHSc, project nurse,

Meeting Relatives in Trauma Centers

Research training students, main supervisor

Katarina Weibel Hansen, stud. med.

Patients with pulmonary embolism. Flow in Emergency Departments in a COVID-19 era (research protocol)

Mentor postdoc project

Claus Sixtus Jensen, PhD

Individual Paediatric Early Warning System (I-PEWS) - Does systematic incorporation of nurses clinical judgment in a Paediatric Early Warning System improve detection of clinical deterioration in hospitalised paediatric patients - a cluster randomized trial

Lars Wiuff Andersen, associate professor

PhD students, main supervisor

Nikola Stankovic

The Relationship Between Socioeconomic Factors and Incidence, Treatments, and Outcomes for Patients with In-Hospital Cardiac Arrest in Denmark

Mikael Fink Vallentin (Prehospital Emergency Medical Services, the Central Denmark Region)
Calcium for Out-of-Hospital Cardiac Arrest – A Randomized, Double-Blind, Placebo-Controlled Trial

PhD students, co-supervisor

Marie Kristine Jessen

Fluid administration in adult emergency department patients with sepsis
Main supervisor Hans Kirkegaard

Lauge Vammen

Clinically relevant cardiac arrest survival model and intervention with thiamine
Main supervisor Asger Granfeldt

Claus Sixtus Jensen, postdoc

PhD student, co-supervisor

Mai Buus

Giving children and young people a voice - translating and pre-testing a patient-reported experience measure in a Danish paediatric setting
Main supervisor Marianne Lisby

Josefine Rørbech

Child And Family-Centered Cancer Care Intervention - A development and feasibility study
Main supervisor Pia Dreyer

Camilla Littau Nielsen

Vi vil bare gerne være en familie - Børn med kræft og deres familier
Main Supervisor Jane Clemensen

Mathias Holmberg, MD, PhD

PhD students, co-supervisor

Nikola Stankovic

The Relationship Between Socioeconomic Factors and Incidence, Treatments, and Outcomes for Patients with In-Hospital Cardiac Arrest in Denmark
Main supervisor Lars Wiuff Andersen

Rasmus Aagaard, MD, PhD

PhD student, co-supervisor

Stig Holm Ovesen

Focused Lung Ultrasound and Pneumonia in the Emergency Department
Main supervisor Hans Kirkegaard

Kasper Glerup Lauridsen

PhD student, co-supervisor

Sandra Langsted

Ultra sound guided thoracentesis in the Emergency Department – training and clinical performance

Main supervisor Bo Løfgren

Master Thesis, co-supervisor

The Use of Telemetry Following Acute Myocardial Infarction

Sofie Paarup Thomsen (Aarhus University Health)

Main supervisor Bo Løfgren

Marie Kristine Jessen

Master Thesis, co-supervisor

Marie Egebjerg Jensen

Effekten af præhospital transport på 24 timers væskebehandling hos patienter med mistænkt infektion

Main supervisor Hans Kirkegaard

Project nurse, AQUA 24 and REFACED Sepsis

Marie-Louise Holm Thomsen

6. Current national research projects

VAM-IHCA

Vasopressin and Methylprednisolone for In-Hospital Cardiac Arrest – A Randomized, Double-Blind, Placebo-Controlled Trial

Principal investigator Lars W. Andersen (RECEM)

SHINE-TRAUMA

Efficacy and safety of 72-hour infusion of Prostacyclin (1 ng/kg/min) in trauma patients with haemorrhagic shock induced endotheliopathy – a multicentre randomized, placebo-controlled, blinded, investigator-initiated trial

Principal investigator Pär Johansson Copenhagen University

RECEM investigators Hans Kirkegaard and Christian Fenger-Eriksen

Individual Paediatric Early Warning System (I-PEWS)

Does systematic incorporation of nurses clinical judgment in a Paediatric Early Warning System improve detection of clinical deterioration in hospitalised paediatric patients

Principal investigator Claus Sixtus Jensen (RECEM)

REFACED Sepsis

Restrictive Fluid Administration vs. Standard of Care in Emergency

Department Sepsis Patients (REFACED Sepsis) - a Multicenter, Randomized Clinical Feasibility Trial

Principal investigator Marie Kristine Jessen (RECEM)

7. Current international research projects

TTH48 Targeted Temperature Management for 24 vs 48 hours

The main study is published, sub-study's in preparation

Principal investigator Hans Kirkegaard

TTM2 – Targeted Temperature Management 2

Principal investigator Niklas Nielsen, Lund University

RECEM investigators Hans Kirkegaard and Anders Grejs

TAME

Targeted Therapeutic Mild Hypercapnia After Resuscitated Cardiac Arrest: A Phase III Multi-Centre Randomised Controlled Trial.

Principal investigator Glenn Eastwood Monash University, Melbourne

RECEM investigators Hans Kirkegaard and Anders Grejs

8. Peer review publications

1. Østergaard AMH, Grove EL, Lauridsen KG, Løfgren B. Different perceptions of thorax anatomy and hand placement for chest compressions among healthcare professionals and laypersons: Implications for cardiopulmonary resuscitation. *Resuscitation plus*. 2021 sep.;7:100138. <https://doi.org/10.1016/j.resplu.2021.100138>
2. van den Ende ES, Schouten B, Kremers MNT, Cooksley T, Subbe CP, Weichert I et al. Understanding what matters most to patients in acute care in seven countries, using the flash mob study design. *BMC Health Services Research*. 2021 maj;21(1). 474. <https://doi.org/10.1186/s12913-021-06459-4>
3. COVID-19 working group, Lauridsen KG, Anders LW, Holmberg MJ, Granfeldt A et al. 2021 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Neonatal Life Support; Education, Implementation, and Teams; First Aid Task Forces; and the COVID-19 Working Group. *Resuscitation*. 2021 dec.;169:229-311. <https://doi.org/10.1016/j.resuscitation.2021.10.040>
4. COVID-19 working group, Lauridsen KG, Anders LW, Holmberg MJ, Granfeldt A et al. 2021 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Neonatal Life Support; Education, Implementation, and Teams; First Aid Task Forces; and the COVID-19 Working Group. *Circulation*. 2021 nov. 11. <https://doi.org/10.1161/CIR.0000000000001017>

5. Weile J, Nebbjerg MA, Ovesen SH, Paltved C, Ingeman ML. Simulation-based team training in time-critical clinical presentations in emergency medicine and critical care: a review of the literature. *Advances in Simulation*. 2021 jan.;6. 3. <https://doi.org/10.1186/s41077-021-00154-4>
6. Vestergård LD, Lauridsen KG, Krarup NHV, Kristensen JU, Andersen LK, Løfgren B. Quality of Cardiopulmonary Resuscitation and 5-Year Survival Following in-Hospital Cardiac Arrest. *Open Access Emergency Medicine*. 2021;13:553-560. <https://doi.org/10.2147/OAEM.S341479>
7. Vammen L, Munch Johannsen C, Magnussen A, Povlsen A, Riis Petersen S, Azizi A et al. Cardiac Arrest in Pigs With 48 hours of Post-Resuscitation Care Induced by 2 Methods of Myocardial Infarction: A Methodological Description. *Journal of the American Heart Association*. 2021 dec. 7;10(23). e022679. <https://doi.org/10.1161/JAHA.121.022679>
8. Vallentin MF, Granfeldt A, Meilandt C, Povlsen AL, Sindberg B, Holmberg MJ et al. Effect of Intravenous or Intraosseous Calcium vs Saline on Return of Spontaneous Circulation in Adults With Out-of-Hospital Cardiac Arrest: A Randomized Clinical Trial. *JAMA*. 2021 dec. 14;326(22):2268-2276. <https://doi.org/10.1001/jama.2021.20929>
9. Tygesen GB, Lisby M, Raaber N, Rask MT, Kirkegaard H. A new situation awareness model decreases clinical deterioration in the emergency departments—A controlled intervention study. *Acta Anaesthesiologica Scandinavica*. 2021 okt.;65(9):1337-1344. <https://doi.org/10.1111/aas.13929>
10. Trier F, Fjølner J, Raaber N, Sørensen AH, Kirkegaard H. Effect of the COVID-19 pandemic at a major Danish trauma center in 2020 compared with 2018-2019: A retrospective cohort study. *Acta Anaesthesiol Scand*. 2022;66(2):265-272. doi:10.1111/aas.13997
11. Thøgersen TW, Sædder EA, Lisby M. Is a High Medication Risk Score Associated With Increased Risk of 30-Day Readmission? A Population-Based Cohort Study From CROSS-TRACKS. *Journal of Patient Safety*. 2021 dec. <https://doi.org/10.1097/PTS.0000000000000939>
12. Tchijevitch OA, Nielsen LP, Lisby M. Life-Threatening and Fatal Adverse Drug Events in a Danish University Hospital. *Journal of Patient Safety*. 2021 sep.;17(6):562-567. <https://doi.org/10.1097/PTS.0000000000000411>
13. Sørensen SF, Ovesen SH, Lisby M, Mandau MH, Thomsen IK, Kirkegaard H. Predicting mortality and readmission based on chief complaint in emergency department patients: A cohort study. *Trauma Surgery and Acute Care Open*. 2021 dec.;6(1). e000604. <https://doi.org/10.1136/tsaco-2020-000604>

14. Svingel LS, Storgaard M, Esen BÖ, Ebdrup L, Ahrensberg J, Larsen KM et al. Prognostic and discriminative accuracy of the quick Sepsis-related Organ Failure Assessment compared with an early warning score: a Danish cohort study. *Emergency Medicine Journal*. 2021 nov. 1. <https://doi.org/10.1136/emered-2020-209746>
15. Stærk M, Vammen L, Andersen CF, Krogh K, Løfgren B. Basic life support skills can be improved among certified basic life support instructors. *Resuscitation plus*. 2021 jun.;6. <https://doi.org/10.1016/j.resplu.2021.100120>
16. Stankovic N, Høybye M, Holmberg MJ, Lauridsen KG, Andersen LW, Granfeldt A. Factors associated with shockable versus non-shockable rhythms in patients with in-hospital cardiac arrest. *Resuscitation*. 2021 jan.;158:166-174. <https://doi.org/10.1016/j.resuscitation.2020.11.022>
17. Stankovic N, Holmberg MJ, Høybye M, Granfeldt A, Andersen LW. Age and sex differences in outcomes after in-hospital cardiac arrest. *Resuscitation*. 2021 aug.;165:58-65. <https://doi.org/10.1016/j.resuscitation.2021.05.017>
18. Seidenfaden SC, Kjerulff JL, Juul N, Kirkegaard H, Møller MF, Münster AMB et al. Diagnostic accuracy of prehospital serum S100B and GFAP in patients with mild traumatic brain injury: a prospective observational multicenter cohort study – “the PreTBI I study”. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*. 2021 dec.;29. 75. <https://doi.org/10.1186/s13049-021-00891-5>
19. Schmidt AS, Lauridsen KG, Møller DS, Christensen PD, Dodt KK, Rickers H et al. Anterior-Lateral Versus Anterior-Posterior Electrode Position for Cardioverting Atrial Fibrillation. *Circulation*. 2021 dec.;144(25):1995-2003. <https://doi.org/10.1161/CIRCULATIONAHA.121.056301>
20. Ross CE, Moskowitz A, Grossestreuer AV, Holmberg MJ, Andersen LW, Yankama TT et al. Trends over time in drug administration during pediatric in-hospital cardiac arrest in the United States. *Resuscitation*. 2021 jan.;158:243-252. <https://doi.org/10.1016/j.resuscitation.2020.09.040>
21. Pfeiffer S, Lauridsen KG, Wenger J, Hunt EA, Haskell S, Atkins DL et al. Code Team Structure and Training in the Pediatric Resuscitation Quality International Collaborative. *Pediatric Emergency Care*. 2021;37(8):E431-E435. <https://doi.org/10.1097/PEC.0000000000001748>
22. Paramanathan S, Grejs AM, Jeppesen AN, Søreide E, Kirkegaard H, Duez CHV. Copeptin as a Prognostic Marker in Prolonged Targeted Temperature Management After Out-of-Hospital Cardiac Arrest. *Therapeutic Hypothermia and Temperature Management*. 2021 dec.;11(4):216-222. <https://doi.org/10.1089/ther.2020.0030>

23. Nguyen DT, Lauridsen KG, Krogh K, Løfgren B. Bystander performance using the 2010 vs 2015 ERC guidelines: A post-hoc analysis of two randomised simulation trials. *Resuscitation plus*. 2021 jun.;6. 100123. <https://doi.org/10.1016/j.resplu.2021.100123>
24. Müller SD, Lauridsen KG, Palic AH, Frederiksen LN, Mathiasen M, Løfgren B. Mobile app support for cardiopulmonary resuscitation: Development and usability study. *JMIR mHealth and uHealth*. 2021 jan.;9(1). e16114. <https://doi.org/10.2196/16114>
25. Müller SD, Kristensen M, Lauridsen KG, Zwanenburg M, Løfgren B. IT, situation awareness, and non-technical skills in cardiac arrest teams. I Bui TX, red., *Proceedings of the 54th Hawaii International Conference on System Sciences*. University of Hawai'i at Manoa . 2021. s. 3635-3644 <https://doi.org/10.24251/HICSS.2021.441>
26. Madsen J, Lauridsen KG, Løfgren B. In-hospital cardiac arrest call procedures and delays of the cardiac arrest team: A nationwide study. *Resuscitation plus*. 2021 mar.;5. 100087. <https://doi.org/10.1016/j.resplu.2021.100087>, <https://doi.org/10.1016/j.resplu.2021.100087>
27. Lind PC, Munch Johannsen C, Vammen L, Magnussen A, Andersen LW, Granfeldt A. Translation from animal studies of novel pharmacological therapies to clinical trials in cardiac arrest: A systematic review. *Resuscitation*. 2021 jan.;158:258-269. <https://doi.org/10.1016/j.resuscitation.2020.10.028>
28. Lauritsen SM, Thiesson B, Jørgensen MJ, Riis AH, Espelund US, Weile JB et al. The Framing of machine learning risk prediction models illustrated by evaluation of sepsis in general wards. *npj Digital Medicine*. 2021 nov.;4. 158. <https://doi.org/10.1038/s41746-021-00529-x>
29. Lauridsen KG, Baldi E, Smyth M, Perkins GD, Greif R, Education Implementation and Team Task Force of the International Liaison Committee on Resuscitation (ILCOR). Clinical decision rules for termination of resuscitation during in-hospital cardiac arrest: A systematic review of diagnostic test accuracy studies. *Resuscitation*. 2021 jan.;158:23-29. <https://doi.org/10.1016/j.resuscitation.2020.10.036>
30. Lauridsen KG, Morgan RW, Niles DE, Duval-Arnould J, Berg R, Sutton RM et al. 1193: Chest compression quality before and after pauses during pediatric In-hospital Resuscitation. *Critical Care Medicine*. 2021 jan.;49(Supplement 1):599. <https://doi.org/10.1097/01.ccm.0000730660.01504.eb>
31. Lauridsen KG, Krogh K, Müller SD, Schmidt AS, Nadkarni VM, Berg RA et al. Barriers and facilitators for in-hospital resuscitation: A prospective clinical study. *Resuscitation*. 2021 jul.;164:70-78. <https://doi.org/10.1016/j.resuscitation.2021.05.007>

32. Lauridsen KG, Højbjerg R, Schmidt AS, Løfgren B. Why Do Not Physicians Attend Hospital Cardiopulmonary Resuscitation Training? Open Access Emergency Medicine. 2021 dec.;13:543-551. <https://doi.org/10.2147/OAEM.S332739>
33. Lauridsen KG, Morgan RW, Dewan M, Gawronski O, Sen AI, PediRES-Q Investigators. In-hospital cardiac arrest characteristics, CPR quality, and outcomes in children with COVID-19. Resuscitation. 2021 dec.;169:39-40. <https://doi.org/10.1016/j.resuscitation.2021.10.013>
34. Lauridsen KG, Løfgren B, Brogaard L, Paltved C, Hvidman L, Krogh K. Cardiopulmonary Resuscitation Training for Healthcare Professionals: A Scoping Review. Simulation in healthcare : journal of the Society for Simulation in Healthcare. 2021 okt. 13. <https://doi.org/10.1097/SIH.0000000000000608>
35. Larsen KSR, Lisby M, Kirkegaard H, Petersen AK. Functional decline in emergency department patients with dyspnea: A register-based cohort. International Journal for Quality in Health Care. 2021;33(1). mzab047. <https://doi.org/10.1093/intqhc/mzab047>
36. Johansson PI, Eriksen CF, Schmal H, Gaarder C, Pall M, Henriksen HH et al. Efficacy and safety of iloprost in trauma patients with haemorrhagic shock-induced endotheliopathy- Protocol for the multicentre randomized, placebo-controlled, blinded, investigator-initiated shine-trauma trial. Acta Anaesthesiologica Scandinavica. 2021 apr.;65(4):551-557. <https://doi.org/10.1111/aas.13776>
37. Jessen MK, Andersen LW, Thomsen MLH, Jensen ME, Kirk ME, Kildegaard S et al. Twenty-four-hour fluid administration in emergency department patients with suspected infection: A multicenter, prospective, observational study. Acta Anaesthesiologica Scandinavica. 2021 sep.;65(8):1122-1142. <https://doi.org/10.1111/aas.13848>
38. Jessen MK, Fink Vallentin M, Holmberg MJ, Bolther M, Hansen FB, Holst JM et al. Goal-directed haemodynamic therapy during general anaesthesia for noncardiac surgery: a systematic review and meta-analysis. British Journal of Anaesthesia. 2021 dec. 13. <https://doi.org/10.1016/j.bja.2021.10.046>
39. Jensen TH, Juhl-Olsen P, Nielsen BRR, Heiberg J, Duez CHV, Jeppesen AN et al. Echocardiographic parameters during prolonged targeted temperature Management in out-of-hospital Cardiac Arrest Survivors to predict neurological outcome – a post-hoc analysis of the TTH48 trial. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine. 2021 feb.;29(1). 37. <https://doi.org/10.1186/s13049-021-00849-7>
40. Iversen BN, Meilandt C, Væggemose U, Terkelsen CJ, Kirkegaard H, Fjølner J. Pre-charging the defibrillator before rhythm analysis reduces hands-off time in patients with out-of-hospital cardiac arrest with shockable rhythm. Resuscitation. 2021 dec.;169:23-30. <https://doi.org/10.1016/j.resuscitation.2021.09.037>

41. Høybye M, Stankovic N, Holmberg M, Christensen HC, Granfeldt A, Andersen LW. In-Hospital vs. Out-of-Hospital Cardiac Arrest: Patient Characteristics and Survival. *Resuscitation*. 2021 jan.;158:157-165. <https://doi.org/10.1016/j.resuscitation.2020.11.016>
42. Høybye M, Stankovic N, Lauridsen KG, Holmberg MJ, Andersen LW, Granfeldt A. Pulseless electrical activity vs. asystole in adult in-hospital cardiac arrest: Predictors and outcomes. *Resuscitation*. 2021 aug.;165:50-57. <https://doi.org/10.1016/j.resuscitation.2021.05.036>
43. Hästbacka J, Kirkegaard H, Søreide E, Taccone FS, Rasmussen BS, Storm C et al. Severe or critical hypotension during post cardiac arrest care is associated with factors available on admission - a post hoc analysis of the TTH48 trial. *Journal of Critical Care*. 2021 feb.;61:186-190. <https://doi.org/10.1016/j.jcrc.2020.10.026>
44. Hovgaard HL, Juhl-Olsen P, Krogh KB. Pneumothorax efter selvudført akupunktur. *Ugeskrift for Læger*. 2021 jan.;183(4). V08200603.
45. Holmberg MJ, Andersen LW, Moskowitz A, Berg KM, Cocchi MN, Chase M et al. Ubiquinol (reduced Coenzyme Q10) as a Metabolic Resuscitator in Post-Cardiac Arrest: A Randomized, Double-Blind, Placebo-Controlled Trial. *Resuscitation*. 2021 maj;162:388-395. <https://doi.org/10.1016/j.resuscitation.2021.01.041>
46. Holmberg MJ, Granfeldt A, Moskowitz A, Andersen LW, American Heart Association's Get With The Guidelines-Resuscitation Investigators. Age-Related Cognitive Bias in In-Hospital Cardiac Arrest. *Resuscitation*. 2021 maj;162(5):43-46. <https://doi.org/10.1016/j.resuscitation.2021.01.016>
47. Holm A, Kirkegaard H, Taccone FS, Søreide E, Grejs AM, Toome V et al. Factors Associated With Rebound Hyperthermia After Targeted Temperature Management in Out-of-Hospital Cardiac Arrest Patients: An Explorative Substudy of the Time-Differentiated Therapeutic Hypothermia in Out-of-Hospital Cardiac Arrest Survivors Trial. *Critical care explorations*. 2021 jul.;3(7). e0458. <https://doi.org/10.1097/CCE.0000000000000458>
48. Hoeyer-Nielsen AK, Holmberg MJ, Grossestreuer AV, Yankama T, Branton J-P, Donnino MW et al. Association Between the Oxygen Consumption: Lactate Ratio and Survival in Critically Ill Patients With Sepsis. *Shock*. 2021 jun.;55(6):775-781. <https://doi.org/10.1097/shk.0000000000001661>
49. Hoeyer-Nielsen AK, Holmberg MJ, Christensen EF, Cocchi MN, Donnino MW, Grossestreuer AV. Thermoregulation in Post-cardiac Arrest Patients Treated with Targeted Temperature Management. *Resuscitation*. 2021 maj;162:63-69. <https://doi.org/10.1016/j.resuscitation.2021.02.005>

50. Heimborg K, Lilja G, Tornberg ÅB, Ullén S, Blennow Nordström E, Friberg H, Kirkegaard H et al. Physical activity after cardiac arrest; protocol of a sub-study in the Targeted Hypothermia versus Targeted Normothermia after Out-of-Hospital Cardiac Arrest trial (TTM2). *Resuscitation plus*. 2021 mar.;5. 100076. <https://doi.org/10.1016/j.resplu.2021.100076>
51. Hansen FB, Secher N, Mattson T, Løfgren B, Simonsen U, Granfeldt A. Effect of the KCa3.1 blocker, senicapoc, on cerebral edema and cardiovascular function after cardiac arrest — A randomized experimental rat study. *Resuscitation plus*. 2021 jun.;6. 100111. <https://doi.org/10.1016/j.resplu.2021.100111>
52. Hansen FB, Esteves G, Mogensen S, Prat Duran J, Secher N, Løfgren B et al. Increased cerebral endothelium-dependent vasodilation in rats in the postcardiac arrest period. *Journal of Applied Physiology*. 2021 okt.;131(4):1311-1327. <https://doi.org/10.1152/japplphysiol.00373.2021>
53. Hansen MV, Løfgren B, Lauridsen KG. Layperson use of AEDs - what happens after shock delivery? *Resuscitation*. 2021 dec.;169:113-114. <https://doi.org/10.1016/j.resuscitation.2021.10.032>
54. Granholm A, Kaas-Hansen BS, Kjær MBN, Anthon CT, Sivapalan P, Schjørring OL, Andersen LW et al. Patient-important outcomes other than mortality in recent ICU trials: Protocol for a scoping review. *Acta Anaesthesiologica Scandinavica*. 2021 aug.;65(7):1002-1007. <https://doi.org/10.1111/aas.13937>
55. Granfeldt A, Holmberg MJ, Nolan JP, Soar J, Andersen LW, Advanced Life Support Task Force at the International Liaison Committee on Resuscitation (ILCOR). Targeted Temperature Management in Adult Cardiac Arrest: Systematic Review and Meta-Analysis. *Resuscitation*. 2021 okt.;167:160-172. <https://doi.org/10.1016/j.resuscitation.2021.08.040>
56. Granfeldt A, Holmberg MJ, Nolan JP, Soar J, Andersen LW. Reply to: Meta-analyses of targeted temperature management in adult cardiac arrest studies - the big picture is dependent on study selection! *Resuscitation*. 2021 dec.;169:225-226. <https://doi.org/10.1016/j.resuscitation.2021.10.018>
57. Evald L, Brønnick K, Duez CHV, Grejs AM, Jeppesen AN, Søreide E et al. Younger age is associated with higher levels of self-reported affective and cognitive sequelae six months post-cardiac arrest. *Resuscitation*. 2021 aug.;165:148-153. <https://doi.org/10.1016/j.resuscitation.2021.04.009>
58. TTH48 Investigators. Quality of targeted temperature management and outcome of out-of-hospital cardiac arrest patients: A post hoc analysis of the TTH48 study. *Resuscitation*. 2021 jun. 21;165:85-92. <https://doi.org/10.1016/j.resuscitation.2021.06.007>

59. Brønnick K, Evald L, Valdemar Duez CH, Grejs AM, Jeppesen AN, Kirkegaard H et al. Biomarker prognostication of cognitive impairment may be feasible even in out-of hospital cardial arrest survivors with good neurological outcome. *Resuscitation*. 2021 maj;162:396-402. <https://doi.org/10.1016/j.resuscitation.2021.02.025>
60. Brogård Andersen H, Andersen M, Hansen LH, Andelius TCK, Ringgaard S, Løfgren B et al. Resuscitation after cardiac arrest in a newborn piglet model of LPS induced sepsis; randomization to epinephrine versus placebo and the effects on ROSC and markers of CNS outcome. *Pediatric Research*. 2021 okt. 13;90(4):45. ID362. <https://doi.org/10.1038/s41390-021-01765-3>
61. Bach HM, Duez CHV, Jeppesen AN, Strand K, Søreide E, Kirkegaard H et al. MR-proANP and NT-proBNP During Targeted Temperature Management Following Out-of-Hospital Cardiac Arrest: A Post hoc Analysis of the TTH48 Trial. *Therapeutic Hypothermia and Temperature Management*. 2021 aug. 10. <https://doi.org/10.1089/ther.2021.0012>
62. Arvig MD, Laursen CB, Weile JB, Tiwald G, Graumann O, Posth S. Point of care-UL-skanning i danske akutafdelinger. *Ugeskrift for Læger*. 2021 apr.;183(16). V12200906.
63. Andersen LW, Sindberg B, Holmberg MJ, Isbye DL, Kjaergaard J, Zwisler ST et al. Vasopressin and methylprednisolone for in-hospital cardiac arrest: Protocol for a randomized, double-blind, placebo-controlled trial. *Resuscitation Plus*. 2021 mar.;5. 100081. <https://doi.org/10.1016/j.resplu.2021.100081>
64. Andersen LH, Løfgren B, Krogh K, Nadkarni V, Lauridsen KG. Perceived challenges during resuscitation of in-hospital cardiac arrests in the COVID-19 era. *Resuscitation*. 2021 okt.;167:89-90. <https://doi.org/10.1016/j.resuscitation.2021.08.021>
65. Andersen CF, Bang C, Lauridsen KG, Frederiksen CA, Schmidt M, Jensen T et al. Single troponin measurement to rule-out acute myocardial infarction in early presenters. *International Journal of Cardiology*. 2021 okt.;341:15-21. <https://doi.org/10.1016/j.ijcard.2021.08.005>
66. Andersen LW, Isbye D, Kjaergaard J, Kristensen CM, Darling S, Zwisler ST et al. Effect of Vasopressin and Methylprednisolone vs Placebo on Return of Spontaneous Circulation in Patients with In-Hospital Cardiac Arrest: A Randomized Clinical Trial. *JAMA*. 2021 okt.;326(16):1586-1594. <https://doi.org/10.1001/jama.2021.16628>
67. Andersen CF, Bang C, Lauridsen KG, Frederiksen CA, Schmidt M, Jensen T et al. External validation of a high-sensitive troponin I algorithm for rapid evaluation of acute myocardial infarction in a Danish cohort. *European Heart Journal: Acute Cardiovascular Care*. 2021 dec.;10(9):1056-1064. <https://doi.org/10.1093/ehjacc/zuab062>

68. Kobberup FB, Sode B-S, Tygesen GB, Kalmríz M. Investigating the possibilities of using patient-generated health data in emergency care: an explorative study. *Dansk Tidsskrift for Akutmedicin*. 2021 sep.;4(1):10-18.

9. Book chapter

1. Bové HM, Norlyk A. Med Lifeworld led care i en akutafdeling. I *Sygeplejens superhelte : Sygeplejeteoretikere der styrker klinisk praksis*. København: Munksgaard . 2021. s. 61-76

10. Invited international lectures and presentations

Lars Wiuff Andersen

Critical Care Reviews Trials Results Livestream
VAM-IHCA Trial
29 September 2021

Critical Care Reviews Trials Results Livestream
COCA Trial
30 November 2021

Claus Sixtus Jensen

EuSEM - Portugal
Signs and symptoms, apart from vital signs, that trigger nurses' concerns about deteriorating conditions in hospitalized pediatric patients: A scoping review
27 October 2021 - 31 October 2021

11. Invited national lectures and presentations

Kristian Krogh

Danish Orthopaedic Association, Keynote-speaker, UDDU-symposium
18 November 2021

12. International cooperation

Hans Kirkegaard

Eldar Søreide, Professor, MD, PhD, FERC, Department of Anaesthesiology and Intensive Care and Alf Inge Larsen, Professor, MD, PhD, FESC; Department of Cardiology, Stavanger University Hospital, Stavanger, Norway and Department of Clinical Medicine, University of Bergen, Bergen, Norway

Fabio Silvio Taccone, Professor, MD, PhD; Department of Intensive Care, Erasme Hospital, Université Libre de Bruxelles (ULB), Brussels, Belgium

Valdo Toome, MD; Department of Intensive Cardiac Care, North Estonia Medical Centre, Tallinn, Estonia

Christian Storm, MD, PhD; Department of Internal Medicine, Nephrology and Intensive Care, Charité-Universitätsmedizin Berlin, Berlin, Germany

Timo Laitio, MD, PhD; Department of Anaesthesiology and Intensive Care, Turku University Hospital and University of Turku, Finland

Markus B Skrifvars, Associated professor, MD, PhD, EDIC, FCICM; Division of Intensive Care, Department of Anesthesiology and Intensive Care Medicine, Helsinki University Hospital and University of Helsinki, Finland, and Australian and New Zealand Intensive Care Research Centre, School of Public Health and Preventive Medicine, Monash University Melbourne, Australia
Nathan Shapiro Ass. Professor, MD Emergency Department, Beth Israel Deaconess Medical Center, Longwood, Boston, USA
Michael Donnino, Ass. Professor MD, Emergency Department, Beth Israel Deaconess Medical Center, Longwood, Boston, USA
Bo Madsen, Associated professor, MD, Emergency Department, Mayo Clinic, Rochester, Minnesota, USA
Jeff Keep, MD, FRCER Consultant & Honorary Senior Lecturer in Emergency Medicine & Major Trauma Lead for Research & Clinical Governance King's College Hospital, London, United Kingdom
Philip Andersson, Adjunct professor, MD, Emergency Department, Brigham & Womens Hospital, Boston, MA, USA.
Dr. Ben Bloom Consultant Emergency Medicine, Barts Health NHS Trust Royal London Hospital, United Kingdom

Marianne Lisby

Professor Bernie Pauly, University of Victoria, BC, Canada Professor David Westfall Bates, Brigham & Womens Hospital og Harvard Medical School, MA, USA
Lektor Patricia Dykes, Brigham & Womens Hospital og Harvard Medical School, MA, USA Adjunkt Ronen Rozenblum, Brigham & Womens Hospital og Harvard Medical School, MA, USA
Nordisk samarbejde om Missed Nursing care: Professor Helga Bragadóttir, University of Iceland, Island:
Professor Ingibjörg Hjaltadóttir, University of Iceland, Island Docent Ann-Charlotte Falk, Sverige, Karolinska University Hospital, Sverige Dr. Med. Carolyn Nymark, Karolinska University Hospital, Sverige
Associate professor, Ann-Christin von Vogelsang, Karolinska University Hospital, Sverige
Associate professor Katarina Göransson, Dalarne University, Sverige
Professor Beate Andre, Norwegian University of Science and Technology, Norge
Professor Kjersti Grønning, Norwegian University of Science and Technology, Norge

Kasper Glerup Lauridsen

Professor Vinay Nadkarni, MD, MS, Children's Hospital of Philadelphia & University of Pennsylvania, Perelman School of Medicine, USA
Professor Robert A. Berg, MD, Children's Hospital of Philadelphia & University of Pennsylvania, Perelman School of Medicine, USA
Dr. Akira Nishisaki, MD, MSCE, Children's Hospital of Philadelphia & University of Pennsylvania, Perelman School of Medicine, USA
Professor Robert Greif, MD, Bern University Hospital, Switzerland Dr. Enrico Baldi, MD, University of Pavia, Italy
Ass. Professor Jordan Duval-Arnould, MPH, DrPH, Johns Hopkins University Hospital, USA
Professor Marc Berg, MD, Stanford University & Lucile Packard Children's Hospital, Stanford, USA
Professor Adam Cheng, MD, University of Calgary & Alberta Children's Hospital, Canada Ass. Professor Joyce Yeung, MD, PhD, University Hospitals Birmingham NHS Foundation Trust & University of Warwick, UK
Professor Ian Maconochie, MD, PhD, Imperial College, London, UK
Professor D Therese Djärv, Karolinska Institutet

Lars Wiuff Andersen & Mathias Holmberg

Michael Donnino, BIDMC, Harvard Medical School, Boston

Claus Sixtus Jensen

Professor Ian Maconochie FRCPC FRCPI FRCM PhD Consultant in Paediatric Accident and Emergency Medicine St Mary's Hospital London, UK Faculty of Medicine, Imperial College, London, UK

Professor Colin Powell MB ChB, DCH, MRCP(UK), FRACP, FRCPC, MD Emergency Department Sidra Medical and Research Center, Doha Qatar Emergency Department, Weill Cornell University, Doha Qatar School of Medicine Cardiff University, Cardiff, UK
Dr. Sue Chapman RN, PhD Gulf Regional Clinical Manager Dubai Office

Marie Kristine Jessen

Nathan Shapiro Ass. Professor, MD Emergency Department, Beth Israel Deaconess Medical Center, Longwood, Boston, USA

13. Review committee assessments

Hans Kirkegaard

Chairman of the PhD assessment committee, DESIGN-EM, Aarhus BSS & Aarhus University
Line Stjernholm Tipsmark

Organisation of emergency departments: An evaluation of the policy design
Defence 19 March 2021

Member of PhD review committee
Jens Wretborn

Emergency Department Crowding Objective Modelling based on Workload.
Defence 29 May 2021, Lund University, Sweden

Marianne Lisby

Assessor: PhD dissertation, University of Southern Denmark
Assessor: PhD dissertation, University of Copenhagen

Assessor: Individual course (examiner)
Altered mental status patients in the Danish emergency department: Etiology and mortality.
Cathrine Præst Mose, medical student

Performance of Danish Emergency Process Triage in patients with abdominal pain
Marie Schmidt-Rasmussen Nielsen, medical student

The Prehospital
Rosc after cardiac arrest – prognostic factors to predict outcome after out-of-hospital cardiac arrest
Patrick Ravn Nielsen

Assessor Master Thesis (examiner)
Association between sedative medication and discharge destination in patients assigned chief complaint "Dizziness/risk of fall"

Pernille Dyhrberg, cand.scient.san

Can discharge diagnoses predict readmissions in patients presenting to the emergency department with the chief complaint fever/infection?

Line Hansen, medical student

Assessment committees:

Health Research Foundation of Central Denmark Region, scholarship committee

Health care science fund, Aarhus University Hospital (SVP puljen)

The assessment committee of TVÆRSPOR: to assess projects applying for data from the cohort of TVÆRSPOR

Gitte Boier Thygesen

Editor, Danish Journal of Emergency Medicine (Dansk Tidsskrift for Akutmedicin)

Claus Sixtus Jensen

Assessor: Master in avansert klinisk nyfødtsykepleie at Lovisenberg diakonale høgskole

14. Grants and funding

Awarded researchers listed by rewarding funds

Independent Research Fund Denmark

Kasper Glerup Lauridsen (DKK 600.000)

The Danish Foundation Trygfonden

Mathias J. Holmberg (DKK 195.920)

The Research and Development Foundation of Central Denmark Region

Kasper Glerup Lauridsen (DKK 300.000)

The Research Foundation of Central Denmark Region

Stine Fjendbo Galili (DKK 408.000)

Memorial Foundation of Knud and Edith Eriksen

Sandra Langsted (DKK 25.000)

Seed Grant (spiremidler) Regional Hospital Randers

Sandra Langsted (DKK 19.720)

15. Awards

Best oral presentation among physicians, DEMC9

Effect of after-hour admission on fluid administration in emergency department patients with suspected infection – a sub-study of a prospective, observational multicentre study

Marie Kristine Jessen

The PhD Award 2021 from Aarhus University Research Foundation

Mathias Johan Holmberg

Fogh-Nielsen Competition, 2nd prize

Kasper Glerup Lauridsen

