

Annual report 2022 - 2023

Interdisciplinary Research Unit of Neonatology

Copenhagen University Hospital Rigshospitalet



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All photos are shown with the permission from patients/parents and staff.



Meeting in the Interdisciplinary Research Team

Preface

At the Department of Neonatal and Paediatric Intensive Care, Rigshospitalet we strive to provide evidence-based treatment and care for our patients.

Our Neonatal Interdisciplinary Research Unit (NIRU) is in its' third year of establishment. We have enjoyed working together in the research team and the management team.

Our focus is still to improve interdepartmental collaboration, as well as national, international, and translational collaboration to improve knowledge, sharing and consolidation of our research efforts.

This is the second annual report from our Interdisciplinary Research Unit of Neonatology covering 2022 and 2023, and it is our hope that this will outline the different themes of our work as well as illustrating the future research development and potential.

We hope you will enjoy the report.

Ragnhild Måstrup and Lise Aunsholt



Ragnhild and Lise, leaders of the Interdisciplinary Research Unit of Neonatology

About us

The Department of Neonatal and Paediatric Intensive Care

Sanne Allermann Beck and Morten Breindahl

The Department of Neonatal and Paediatric Intensive Care (NICU/PICU) is a highly specialized department in Denmark. More than 1,200 patients are admitted every year, and the spectrum of diseases ranges from the extreme premature infant to the small toddler up to 2 years in need for highly specialized treatment. Treatment modalities include all kinds of respiratory and circulatory support incl. dialysis and surgery, diagnosis, and treatment of rare genetic diseases incl. inborn errors of metabolism, malformations, and neurological diseases. The department is a national referral center for infants with congenital heart disease and extracorporeal membrane oxygenation (ECMO). Our Transport Team is available 24/7/365 for acute upscale interhospital transports from the other hospitals in the eastern part of Denmark, Greenland, and the Faroe Islands. All these tasks are completed in close cooperation with our colleagues from the other departments in the Juliane Marie Center and Rigshospitalet. Family centered care is a core principle in every aspect of our daily activities, and the family is an integral part of our values. We work interprofessionally with deep respect for each other.



Local collaboration at the meeting in the Interdisciplinary Research Team

The Interdisciplinary Research Unit

Research is one of the cornerstones at Rigshospitalet both in terms of importance and priority. Research findings are obtained and disseminated through extensive national and international collaboration.

The leadership of the Interdisciplinary Research Unit of Neonatology at the Department of Neonatal and Paediatric Intensive Care is handled by our clinical research associate professorsenior consultant, MD, PhD Lise Aunsholt and senior researcher RN, PhD Ragnhild Måstrup.

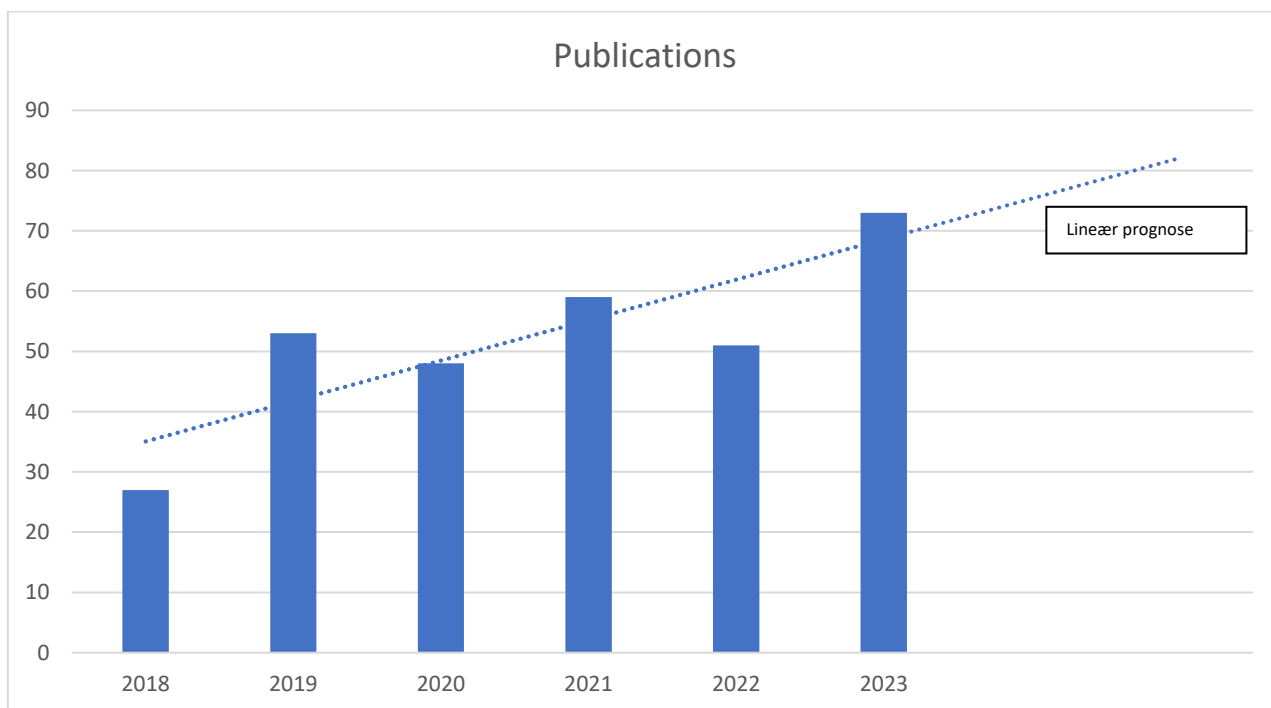
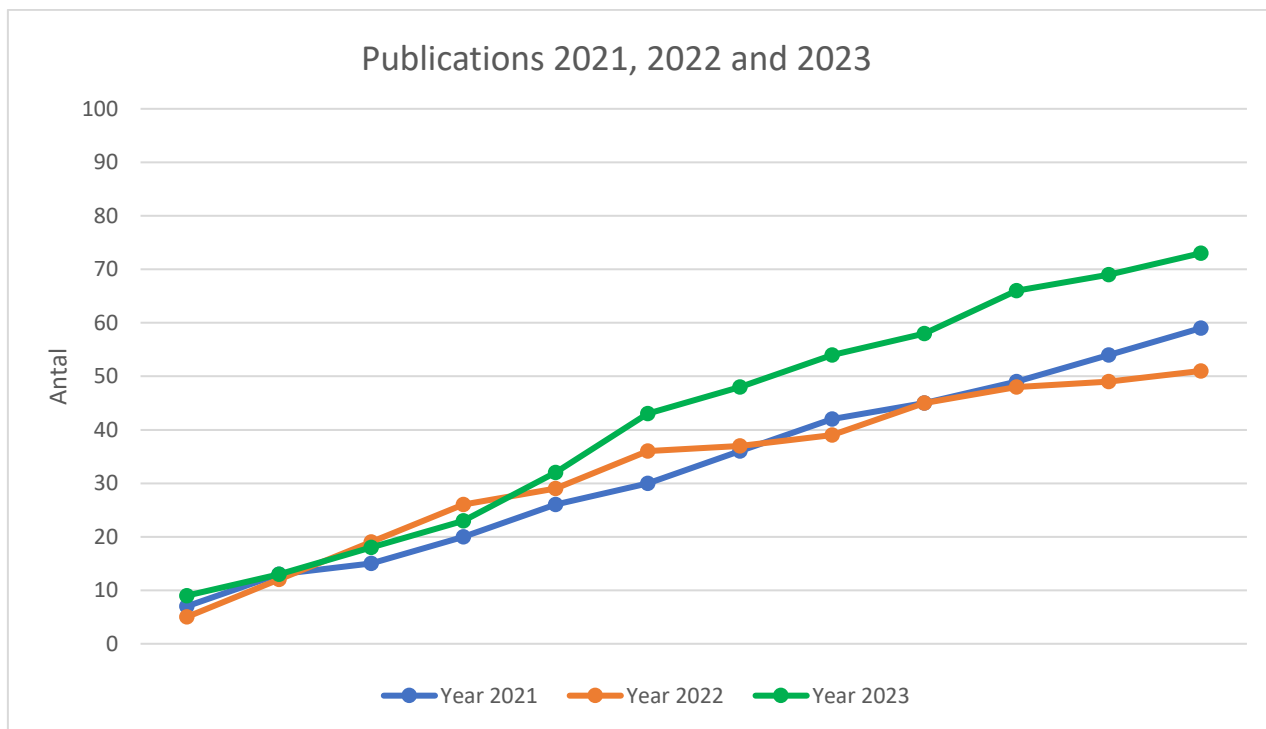
The Interdisciplinary Research Unit comprises a professor emeritus, an external professor, PhD students, postdocs, medical students, and clinicians. In 2022 and 2023, we were involved in 27 research projects.

The department is represented in the leadership of several European Societies and regularly participates in international clinical trials.

Within the last years, we have seen an increased number of active researchers. The interdisciplinary research group meets monthly. We invite speakers, we update each other on our research, share experiences and challenges, inspire and expand projects to be interdisciplinary.



Marie Rasmussen presenting at a meeting



The upper figure is a “true-to-time” curve. The lower figure is from our PURE database. Disparity may appear.

Strategic research areas

The research conducted by members of the Interdisciplinary Research Unit is broad and includes quantitative and qualitative interdisciplinary, monodisciplinary, and multidisciplinary approaches. Studies range from focus on the extreme preterm infant, the critically ill paediatric patient to training strategies to improve skills of health care personal working within the department and are originated locally, national, or internationally.

We aim to include every admitted infant and toddler in at least one research study of either qualitative or quantitative focus, and to improve care, treatment and outcome for future patients. Further, we aim to conduct evidence-based training of colleagues working within the department as part of future studies. We will seek to elaborate our network further and to ensure an interdisciplinary approach. Future studies will aim to include this aspect when possible and meaningful.

It is our ambition to include all the competences available within the interdisciplinary research team to strengthen our output together.



Research is broad and aims at including every admitted infant

PhD projects

Change in gut motility in preterm infants and piglets

Susanne Søndergaard Kappel, (Lise Aunsholt, Ragnhild Måstrup, Per Torp Sangild)

The overall aim of this thesis is to gain better insight into feeding intolerance and disturbed bowel habits in preterm infants. This is reached by infant and piglet studies on how gastric residuals (GR) and gut dysmotility are associated with clinical symptoms, including NEC.

The project has the following goals:

- To identify how GR measurements are used by health care professionals in Denmark. A questionnaire was developed to find out how nurses and physicians conceptualize and describe the evaluation and decision-making for GR measurements (Publiced 2023).
- To evaluate differences in gut motility between infants receiving two types of fortification. Multicentre RCT study. Very preterm infants randomized to human milk fortified with bovine colostrum or conventional fortifier based on formula products (FM85) (Publiced 2022).
- To test if gut transit time, GR volume and composition can predict NEC onset in preterm piglets. An established and validated 5-day protocol for inducing NEC in preterm pigs is used. Gut transit time and GRs are evaluated in healthy piglets and piglets with NEC in relation to diet composition and postnatal age (published February 2020 and January 2021).
- Enrolment ended 31. January 2022. Defended 3rd of June 2022.



Copenhagen BABYSKIN - Barrier dysfunction in Atopic newBorns study

Maria Rasmussen Rinnov, (Simon Trautner)

Aim: examine the development of the skin the first weeks of life in premature infants, and search for biomarkers to predict the onset of atopic dermatitis in both mature and premature infants the first 2 years of life.

Design: two prospective birth cohorts with 150 premature infants and 300 mature infants. We examined the skin repeatedly during the first year of life, and followed-up at 18 and 24 months of age. If signs of eczema before 2 years of age the infants were re-examined.

Status December 2022: Both cohorts recruited from August 2017 to August 2019, last follow-up September 2021. PhD defended in March 2023.

Pediatric delirium in critical care: a prospective intervention study with parental involvement

Rikke Louise Stenkjær, (Suzanne Forsyth Herling, Gorm Greisen, Janne Weis, Erwin Ista and Ingrid Egerod)

Aim: To investigate detection, prevention, and reduction of delirium in acute and critically ill children aged 3 months – 18 years of age. The specific objectives are:

1. To investigate prevalence of delirium and validate the screening tool SOS-PD (published 2022 and 2023)
2. To develop a non-pharmacological complex intervention to prevent pediatric delirium with an international Delphi study (published 2022)
3. To pilot test a non-pharmacologic intervention including partnership with parents to prevent and/or reduce pediatric delirium and investigate parents' experiences of participating in the intervention.

Design: Construct validity evaluation, complex intervention development based on Delphi-study, and evaluation of intervention implementation through semi-structured interviews.

Status December 2023: Three manuscripts were published in 2022-2023. A book chapter about delirium in critically ill children was published in the Autumn of 2022 in the “Delirium”.



Rikke presenting at the EAPS congress 2022

The SafeBoosC-III follow up study

Marie Isabel Rasmussen, (Mathias Lühr Hansen, Gorm Greisen, Bo Mølholm Hansen)

In the SafeBoosC-III trial, treatment guided by cerebral oximetry monitoring for the first 72 hours after birth did not reduce the incidence of death or severe brain injury in extremely preterm infants at 36 weeks' postmenstrual age, as compared with usual care. Despite an association between severe brain injury diagnosed in the neonatal period and later neurodevelopmental disability, this relationship is not always strong. The objective of the SafeBoosC-III follow-up study is to assess mortality, neurodevelopmental disability, or any harm in trial participants at 2 years of corrected age.

Of the 1601 infants randomised in the SafeBoosC-III trial, 1276 infants were alive at 36 weeks' postmenstrual age and will potentially be available for the 2-year follow-up. Inclusion criteria will be enrollment in a neonatal intensive care unit taking part in the follow-up study and parental consent if required by local regulations. We aim to collect data from routine follow-up programmes between the ages of 18 and 30 months of corrected age. If no routine follow-up has been conducted, we will collect informal assessments from other health care records from the age of at least 12 months. A local co-investigator blinded to group allocation will classify outcomes based on these records. We will supplement this with parental questionnaires including the Parent Report of Children's Abilities—Revised. There will be two co-primary outcomes: the composite of death or moderate or severe neurodevelopmental disability and mean Bayley-III/IV cognitive score. We will use a 3-tier model for prioritisation, based on the quality of data. This approach has been chosen to minimise loss to follow-up assuming that little data is better than no data at all. We expect the results of the study to be published during 2025.

PrePhage – improving gut flora in preterm infants using beneficial viruses from healthy infants.

Gustav Riemer Jakobsen (Lise Aunsholt, Susanne Søndergaard Kappel)

The purpose of this study is to improve gut flora in preterm infants and ultimately prevent the severe gut-disease, necrotizing enterocolitis (NEC). We aim to transfer isolated viruses - so called bacteriophages - from healthy term infant stool to preterm infants.

The project has the following sub-goals:

- To map the development of normal gut bacteria and viruses in healthy term infants.
- To test the effect of human bacteriophage transfer to preterm piglets.
- To test the effect and safety of administrating gut-viruses in preterm infants for the first time worldwide.

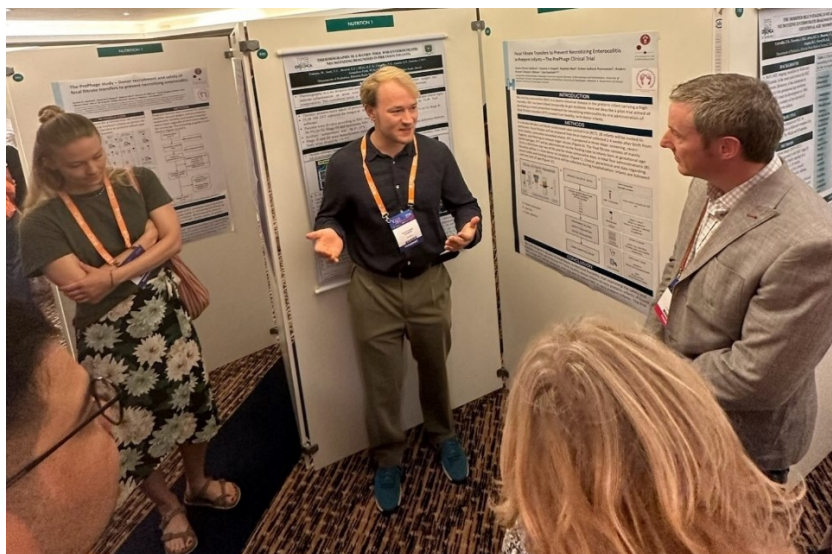
The primary goal is to ensure that the treatment is in fact safe. If the infants receiving the bacteriophages do not experience serious adverse events (SAE), a larger study will be performed.

Status by the end of 2023:

- Recruitment and follow-up of healthy donors has completed
- Safety study in a human-to-pig trial is concluded

Goals for 2024 and 2025:

- Laboratory studies of how bacteriophages interact with host-factors such as human milk or preterm gastric acidity are complete
- Initiate first infant-to-infant fecal filtrate transfer
- Fully randomize 20 infants to receive either the treatment or placebo



Gustav presenting at the jENS conference 2023

NONA-LISA: improving education, assessment of skills, and clinical outcome for surfactant treatment in preterm infants

Niklas Breindahl (Lise Aunsholt, Martin Grønnebæk Tolsgaard og Tine Brink Henriksen)

The research project focuses on surfactant treatment in preterm infants, more specifically the Less Invasive Surfactant Administration (LISA) procedure and how to improve medical education and clinical performance.

First, an international expert consensus will be established on a LISA curriculum (LISA-CUR) and LISA assessment tool (LISA-AT) for training in LISA and evaluation of competence. Second, validity evidence for the LISA-AT will be collected, establishing a pass/fail score and exploring learning curves.

Third, it will be explored whether machine learning can be used to provide automated assessments of LISA performance.

Finally, a multicenter clinical randomized controlled trial will compare a non-pharmacological approach with routine analgesic treatment regarding LISA failure.

- Study 1: Training curriculum and assessment tool for less invasive surfactant administration: an international Delphi consensus study
- Study 2: Collecting validity evidence for the assessment of mastery learning during simulation-based less invasive surfactant administration (LISA) training
- Study 3: Automated assessment using machine learning during simulation-based education of less invasive surfactant administration (LISA)
- Study 4: The non-pharmacological approach less invasive surfactant administration trial (NONA-LISA): protocol for a randomized controlled trial



Niklas presenting at the jENS conference 2023.

Continuity in care and treatment of the new family: Research project on mother-newborn couplet care

Joan Neergaard Larsen (Ragnhild Måstrup, Porntiva Poorisrisak)

The study aims to prepare for a mother-newborn couplet care intervention in family rooms in a highly intensive neonatal and obstetrical department and to develop an educational program for healthcare professionals. The specific aims are:

1. To explore neonatal and obstetrical healthcare professionals' expectations, concerns, and educational needs and to develop an educational program. Focus group study.
2. To map existing clinical practices related to couplet care in Danish obstetric and neonatal departments. Survey.
3. To Investigate clinical data and diagnosis based on medical records for mother-newborn couples to understand the needed level of treatment and care. Cross-sectional study.
4. To measure the level of skin-to-skin contact and lactation for mother-newborn couples across the current neonatal and obstetric departments to identify opportunities for improvement. Survey.

Project period: 01.09.2022 – 31.08.2025

Status Dec 2023: Study 1 submitted. Study 4 data collection ended with 186 respondents.



Joan presenting at the EAPS congress

Pregraduate projects

Methicillin-resistant staphylococcus aureus (MRSA) outbreak in the department of Neonatology, Rigshospitalet

Julia Galuszka (Rikke Louise Stenkjær, Lise Aunsholt).

Purpose: The purpose of the study is to establish which events during hospitalization in the NICU might be connected to a risk of MRSA infection in order to get a better understanding of the MRSA transmission in the department.

Design: The study is a retrospective study based on medical journals from the Department of Neonatology, Rigshospitalet, from 2019 and onward.

Status: Master thesis defended, paper published 2023.

Bowel habits and gastrointestinal presentation in preterm infants

Ulrikke Lyng Beauchamp, (Susanne Søndergaard Kappel, Lise Aunsholt).

Purpose: To investigate whether an implemented observational sheet focusing on bowel habits and gastrointestinal symptoms, will affect the timing of the decision to initiate laxatives in very and extremely preterm infants.

Design: Two retrospective studies; before and after implementation of the observational sheet.

Status December 2022: Manuscript ready for submission. For study two, implementation of the sheet for patients with GA 24 to 30+6 weeks has terminated 150 patients in total. Data registration is ongoing by end of 2023.



Ulrikke presenting at the jENS conference 2023.

Use of antibiotics and the incidence of early and late onset sepsis in preterm infants in East Denmark

Anna Bjerager Arnesen, (Ulrikka Nygaard, Nini Møller, Emma Malchau Carlsen and Bo Mølholm Hansen)

Purpose: This research project consists of two separate studies with an overall aim to investigate the use of antibiotics, the incidence of early and late onset sepsis and the risk of reinfection in a Danish cohort of preterm infants born before 37 weeks of gestation.

Design: A population-based, observational, retrospective cohort study.

Status: Sixty-two preterm infants included from the first study site. Master thesis is defended and manuscript is in preparation.

International consensus on a simulation-based curriculum for neonatologists and interdisciplinary neonatal transport teams

Emma Therese Bay (Niklas Breindahl, Mathilde Maagaard Nielsen, Martin Tolsgaard, Lise Aunsholt)

Purpose: To establish international consensus on a prioritized list of technical skills to be included in a simulation-based curriculum for specialty training in neonatology and interdisciplinary neonatal transport teams, respectively.

Design: Online survey questionnaires using the Delphi method.

Status January 2023: The Delphi study aiming to achieve consensus on a prioritized list of technical skills needed by newly trained neonatologists will conclude in the beginning of March 2023. The article is expected to be submitted in June. The second Delphi study focusing on interdisciplinary neonatal transport teams is initiated ultimo 2023.



Emma with her poster at jENS 2023

The effect of maternal health and social conditions on breast milk composition and the resulting impact on infant growth and health

Natascha Elsborg, (Susanne Søndergaard Kappel, Lise Aunsholt)

Purpose: To examine if certain maternal conditions reduce breast milk quality and, if so, how this affects the infant. This could provide the basis for evaluating the benefit of alternative feeding strategies.

Design: Retrospective cohort study on data from medical journals from approximately 800 hospitalized infants, their mothers, and breast milk analyses performed on a weekly basis.

Status: data registration still ongoing by end of 2023.

Family life with a child who died as newborn

Jens Christian Reventlov Petersen, Gorm Greisen, Laura Emdahl Navne

Aim: to understand the significance of the child and the child's history 10 to 15 years later

Method: Semi structured interviews with 10-15 mothers – and when possible fathers - and thematic analysis.

Status Dec. 2023: Interviews performed.

Duration of skin-to-skin contact in Danish NICUs

Sofia Augoustakis, Ragnhild Maastrup

Aim: To explore the duration of skin-to-skin contact in hospitalized preterm or sick infants in Denmark.

Design: A nationwide cross-sectional survey at all 17 Danish NICUs about skin-to-skin contact in the past 24 hours answered by parents.

Status December 2023: Data collected, paper in manuscript.

Feeding Tube Placement Methods

Sofie Loftager Hansen, (Susanne Søndergaard Kappel, Lise Aunsholt)

Purpose: To evaluate the need for an update of the existing guideline on feeding tube placement methods.

Method: This study reviews the existing methods, tested in clinical studies.

Conclusion: More research is needed on feeding tube placement methods that are applicable in the Danish NICUs, if clinical practises are changed.

Measurement of serum-amoxicillin in newborn infants

Amalie Gudiksen (Emma Louise Malchau Carlsen)

Purpose: To examine the dose of orally administered amoxicillin by measuring trough values.

Design: This is a sub-study, "Absorption of amoxicillin after oral administration". The primary study is a population-based, multicenter, prospective observational cohort study.

Status February 2024: Waiting for statistician to conduct more advanced statistics before publishing article.

Effect of Human Milk Oligosaccharides on the infant gut microbiome: a scoping review

Maria Sofie Reinhardt Jähnel, (Susanne Søndergaard Kappel, Lise Aunsholt)

Purpose: to evaluate existing literature on HMOs impact during weaning and subsequent changes in the gut microbiome in infants.

Design: Scoping review performed using PRISMA-Scr guidelines.

Projects

Detection of EEGraphic seizures by neonatologists using 2-channel monitors. Intra- and interrater agreement

Gitte Holst Hahn, Anne Mette Plomgaard, Christian Heiring, Melita Cacic and Gorm Greisen

Background: Seizures are common in newborn infants and in order to guide anticonvulsive treatment continuous EEG-monitoring of infants with high risk of seizures, or with clinical symptoms that are compatible with seizures, has become standard practice in neonatal intensive care.

Purpose: The purpose of this study is to quantify the intra- and interrater agreement among a rather large group of neonatologists with varying experience in aEEG/EEG monitoring.

Design: Retrospective study on already obtained aEEG/EEG data from 90 mature neonatal infants with regard to seizure burden and background activity.

Status: still awaiting data.

ONE study

Christian Heiring, Lise Aunsholt

Aim: To determine the optimal route for neonatal intubation in an acute situation.

Method: Benchtop study using a simulated neonatal resuscitation measuring different speed and accuracy of different providers performing oral or nasal intubation on a manikin.

Status: Protocol phase.

O2Matic

Christian Heiring

Aim: To assess a device for automatic oxygen control and regulation in preterm infants receiving high flow therapy (HFT) as respiratory support.

Method: Randomized cross-over design in a group of preterm infants on HFT. The patients will cross-over from receiving HFT with standard nurse driven regulation of inspired oxygen level to automatic regulation of inspired oxygen level using a device called O2Matic and vice versa, measuring the duration of the blood oxygen level measured by pulse oximetry being within the prescribed range.

Status: Approved by Research Ethics, recruitment will start 2024.

STABILITY Trial

Christian Heiring, Lise Aunsholt, Emma Malchau Carlsen, Porntiva Poorisrisak, Mathilde Maagaard, Kasper Kyng

Aim: The purpose of this trial (**The STABILITY Trial - Stabilize babies during nasal intubation with CPAP therapy**) is to investigate if the use of CPAP during neonatal intubation via the ETT connected to a T-piece resuscitator will lead to increased stability.

Method: Randomized clinical trial in 4 Danish university based neonatal units.

Status: Protocol phase.

Single-family rooms (SFR) in a NICU: A Thematic analysis of experiences from parents and nurses.

Joan Neergaard Larsen

Background and aims: Due to flooding from broken water pipes we had to move to a satellite unit, with SFR instead of two-bedded rooms. The situation gave us an opportunity to collect experiences from parents and nurses in relation to SFR.

Method: Two focus group interviews with parents and nurses. Before the interviews, the participants were handed a set of unfinished sentences which they completed in writing as self-reflection in preparation for the interview. The unfinished sentences were developed to target each focus group and were inspired by Guided self-determination (GSD) - an evidence-based dialogue tool for mutual decision making. The interviews were analysed using thematic analysis. Ethical approval was obtained, and all participants gave informed consent.

Status December 2023: Article in review process.

SUGARNIRS

Sandra Meinich Juhl, Gitte Holst Hahn, Gorm Greisen

Aim: To determine with near-infrared spectroscopy (NIRS) the plasma glucose threshold at which cerebral oxygenation is not changed after rescue therapy for hypoglycaemia in term or near-term neonates.

Design: To study the effect of an intravenous glucose bolus on cerebral oxygenation in two groups of infants: ¹⁾ 30 *hypoglycaemic* infants treated according to the national guideline for hypoglycaemia, and ²⁾ 30 *normoglycemic* infants receiving an intravenous access to receive antibiotics. The study includes patients admitted to neonatal departments at Rigshospitalet, Hvidovre Hospital, and H.C. Andersen's Children's Hospital in Odense.

Status: Inclusion paused due to changed national guideline and awaits further decision.

Long-term treatment with indomethacin for extreme preterm labor - a single center study

Caroline Madsen (Ane Lando)

Aim: To describe the usage of indomethacin and the neonatal outcome. This is a study from the maternity ward and neonatal ward at Rigshospitalet, Denmark, from 1st of January 2008 till 31st of December 2020. The study includes pregnant women at gestational age < 28 weeks who received long-term treatment with indomethacin..

Project start: April 2022. Project finish June 2023, awaits data interpretation.

LISA vs. INSURE

Sofie Sommer (Christian Heiring, Ane Lando, Emma Malchau Carlsen, Lise Aunsholt)

Aim: To investigate the quality of LISA compared to INSURE. LISA was introduced at the department in August 2017 to reduce ventilator induced lung injury, and is primarily used for infants born before week 28.

Design: A retrospective study of all immature infants receiving surfactant from 2013-2021 in a level IV NICU by LISA or INSURE. Infants exposed to LISA were matched 1:1 with INSURE according to GA and inspired oxygen (FiO₂). A total of 639 immature infants were admitted to the NICU. Of these, 387 received surfactant within the first 72 hours after birth (50 LISA, 85 INSURE, 252 mechanical ventilation).

Status: Manuscript in preparation.

Validation of the Danish version of the EMPATHIC-N questionnaire

Sanne Allermann Beck and Janne Weis

Aim: To translate and validate a Danish version of the EMPATHIC-N (EMpowerment of PArnts in THE Intensive Care-Neonatology) to determine suitability of the instrument for assessing parent satisfaction in Danish NICUs.

Method: A psychometric study design evaluating the validity of the Danish version was applied.

Status: Paper submitted.

CMV CHILD

Stine Lund, Ane Lando, Porntiva Poorisrisak, Anja Poulsen, Ulrikka Nygaard, Lise Aunsholt

Aim: To describe the natural history of and immunology of pCMV amongst immature and premature infants in a Neonatal Intensive Care Unit (NICU).

Design: Single-center prospective, observational cohort study from the 1st February 2022 till 31st January 2024. Eligible infants are born with a GA below 28 weeks or a birthweight below 1,200 grams that receive mother's own milk (MOM). We study ^{a)} the incidence of pCMV in immature infants in a NICU, ^{b)} estimate the mortality and morbidity of pCMV (NEC, ROP, respiratory support, oxygen treatment, admission days), ^{c)} explore the CMV genotypes and immunological response (RNA signature) of children with pCMV, and ^{d)} assess the long-term neurodevelopmental effects of pCMV.

Status: Project ongoing.

The Preterm Infant Obstipation Questionnaire

Susanne Søndergaard Kappel and Lise Aunsholt (Ilan J.N. Koppen, Marc Benninga).

Purpose: To set criteria to define preterm infant constipation and criteria for treatment, based on current interdisciplinary practices. Further, we aim to describe the consequences of preterm infants, reported by nurses and physicians across Europe.

Design: A international questionnaire (Denmark, Norway, Sweden, Belgium, UK, France, Germany and the Netherlands)

Status December 2022: The survey is distributed, data collection terminated december 2023.

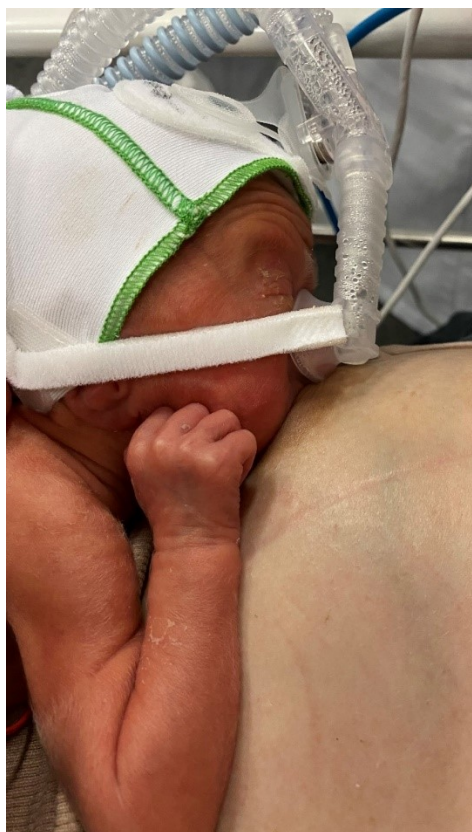
Human milk oligossacharides' (HMO) impact on maturation of the gut microbiota participating

Susanne Søndergaard Kappel and Lise Aunsholt (Maher Abou Hachem)

Purpose: To investigate the role of HMOs from mother's milk in the maturation of a healthy gut bacterial community during weaning.

Design: From 20 mother-infant pairs, samples of mothers' milk and faecal mass, and infant faecal mass are collected just before the introduction of solid food, and thereafter at two occasions during weaning. The samples will be pseudonymized and analyzed to bring insight into the functional aspects of the human gut microbiota during the transition from mother's milk to solid food.

Status December 2022: Recruitment is active by December 2023.



Preterm infants participate in research in early breastfeeding

Support for first time fathers of preterm infants – the SUPPORTED study, sub study 2 and 3

Ragnhild Måstrup, Mette Petersen

Aim sub-study 2: To develop a complex family-centered healthcare intervention to support first-time fathers' engagement in early parenthood when having preterm infants.

Design: The study employs a Participatory Action Research design, utilizes Learning Cycles as the methodology, and will analyze the generated data through thematic analysis.

Status December 2023: The initial workshop, held in December 2023, engaged fathers, public health nurses, and neonatal nurses.

Aim sub study 3: To explore whether an intervention of support in early involvement of first-time fathers of preterm infants has positive effects on the father and the infant.

Design: A quasi-experimental study will evaluate the intervention. During developing phase (2023 – 2024), data will be collected for the comparison group. After implementation, data will be collected for the intervention group (2025).

Status December 2023: Ongoing enrollment of first time fathers for the comparison group (practice as usual).

Hand and arm hygiene compliance among health personnel in a Danish level IV NICU

Sunna Guðrúnardóttir Herrmann, Sussie Laustsen

Aim: To assess and improve hand and arm hygiene compliance among healthcare professionals in a Danish NICU.

Design: Direct observations of hand hygiene opportunities were conducted one month pre-intervention, one month post-intervention, and six months post-intervention.

Status December 2023: Data collected, paper in manuscript.

Researchers

Senior researchers

Lise Aunsholt MD, PH.D. Head of research, Assoc. Professor (CPN-KU), Consultant, Neonatologist.

Lise is senior consultant neonatologist and has been working in the department since 2016. She has since 2019 been associated professor at Comparative Pediatrics and Nutrition and since 2022 at the Institute for Clinical Medicine at University of Copenhagen. She defended her thesis *“Efficacy of bovine colostrum in short bowel syndrome”* in 2013. Main research areas of interest are related to the gastrointestinal tract and the development of the neonate, with a special focus on nutrition for the neonate. Translational research is considered important for her, when effects of nutrition and development of the gastrointestinal tract is investigated, and she values the academic depth related to experimental research. Areas of focus have expanded during the years, to include respiratory problems, and infections in neonates as well as educational aspects. She is/has been tutoring 3 PhD students, 9 master and 5 bachelor students. She is or has been principal investigator of several national and international studies and is collaborating with colleagues from all parts of the world with different academical background. With these, she has had success in receiving funding of more than 20 million DKK.

The aim of her research leadership is to improve the understanding of translational research, to be inclusive and transparent and to help students and colleagues “grow” and achieve their goals.

Ragnhild Måstrup RN, PH.D. Co-leader of the interdisciplinary research unit, nursing researcher.

Ragnhild is a registered nurse and an international board certified lactation consultant (IBCLC). She defended her thesis about factors influencing breastfeeding in preterm infants in 2014. This Danish multicentre study found the following factors in clinical practice as positively associated with exclusive breastfeeding at infant discharge: Early initiation of breastmilk expression, prolonged skin-to-skin contact, minimizing pacifier use during transition to breastfeeding, use of test-weighing, and mother-infant rooming-in. Use of nipple shields was negatively associated with exclusive breastfeeding. A later multicentre study found that implementation of these six practices

improved exclusive breastfeeding rates in preterm infants. She has also been part of developing “The Baby-friendly Hospital Initiative for Neonatal Wards” and measured international compliance with these standards. Other fields of research are skin-to skin contact and pain management in neonates. In the department of neonatology, she serves as a clinical researcher and nurse specialist. She has 23 peer-review publications, 1,300 citations and an H-index of 13.

Gorm Greisen Professor emeritus of Paediatrics

Gorm Greisen became emeritus professor and honorary consultant neonatologist in 2021 after 30 years as consultant, 11 of them as head of department, and more than 20 years as professor. He defended his thesis on cerebral blood flow (CBF) in mechanically ventilated preterm infants in 1989, utilizing the access to 133-xenon clearance as gold-standard method for measuring CBF. He demonstrated that CBF in preterm infants is less than half of the normal values of adults, not higher as expected from animal work. He also demonstrated a robust reactivity of CBF to changes in pCO₂ in preterm infants, and the association between mechanical ventilation, hypocapnia and cerebral palsy. CBF, brain electrical function, cerebral oxygenation as measured by near-infrared spectroscopy and neurodevelopmental outcome has remained his main research focus, culminating in the SafeBoosC-project. Other fields of research are perinatal growth and research ethics. He has tutored more than 30 PhD-students, has more than 400 publications on PubMed, and more than 10,000 citations and an H-index of 54 on Web of Science. He hosted the annual meeting of European Society for Paediatric Research in Copenhagen in 1999 and has held various positions in the society. He is a founding member of the European Neonatal Brain Club.

Per Sangild Professor of Comparative Pediatrics and Nutrition at University of Copenhagen. Part-time Professor of Pediatrics at Rigshospitalet and Odense University Hospitals. He is MSc in Agricultural Science (1986), PhD in Animal Physiology (1990), Doctor of Veterinary Medicine (DVSc, 1996) and Doctor of Human Medicine (DMSc, 2010). Per's research focus is on clinical nutrition and developmental gastroenterology with focus on animal models for infants. Analytical focus is nutrition, metabolism, immunology, microbiology, and endocrinology. Per Sangild has led 50 separate research projects (total 30 mio Euro), supervised 40 PhD students and has international

research experience from United Kingdom, Australia, and China. Publications: 260 peer-review, 450 abstracts, 45 book chapters, H-index 55.



Researching NEC in preterm piglets

Postgraduate researchers

Christian Heiring: Senior consultant neonatologist with primary focus on respiratory support of infants born prematurely in addition to neonatal retrieval medicine.

Emma Malchau Carlsen: Staff specialist, neonatologist, PhD, actively researching neonatal infectious diseases, with focus on incidence and management. In February 2021, the 2-year long prospective cohort study “shift from intravenous to oral antibiotic treatment” was completed and is now being analyzed and prepared for publication.

Gitte Holst Hahn: Staff specialist, neonatologist, PhD, researching neurological conditions in neonates, with a special focus on cerebral oximetry.

Gorm Greisen: Professor emeritus. Research focus on measurement of brain blood flow and oxygenation, hypoxic-ischemic brain injury and the clinical value of monitoring of cerebral oxygenation. Long-term outcome after preterm birth and perinatal growth restriction. Research ethics.

Gustav Riemer Jakobsen: MD, PhD-student. Research field is the preterm gut microbiome and necrotizing enterocolitis (NEC), currently conducting the PrePhage trial which aims to use fecal filtrate transfers to prevent NEC.

Jeppe Nielsen: Staff specialist, pediatric intensivist, PhD, researching sepsis, but lately with more focus on PICU and critically ill children including those with cancer.

Joan Neergaard Larsen: Clinical nurse specialist, RN, PhD-student with a strong interest in family centered care and education. Research in zero-separation for mother-newborn in collaboration with obstetrical department.

Lise Aunsholt, consultant neonatologist, Ph.D., associate professor and Head of research. My main focus is nutrition, intestinal diseases, motility and development, the microbiome and use of antibiotics for preterm and newborn infants. Further respiratory problems related to prematurity and educational research has been included in my curriculum. I have a translational and

interdisciplinary approach and aim to expand areas of interests **Maria Rasmussen Rinnov**, MD, Ph.D. student, Junior doctor. Main research topics are atopic dermatitis and the skin barrier in infants.

Morten Breindahl, head of department, consultant neonatologist, PhD. Special focus on leadership and organizational development, psychological safety, innovation, and entrepreneurship in neonatology. Scientific contributions within acute interfacility transport of the sick newborn infant, stabilisation, resuscitation, and heat loss prevention. Serial inventor and patentholder of NeoHELP® - a resuscitation bag for the very sick newborn and especially preterm infant. Has raised > 35 mio DKK for research and innovation products.

Niklas Breindahl: Medical doctor, PhD-student, conducting research on surfactant treatment in preterm infants, more specifically the Less Invasive Surfactant Administration (LISA) procedure to improve medical education and clinical performance.

Per Torp Sangild; Professor. Research focus on gut, immunity and brain functions after preterm birth and the effects of nutrition, microbiota, and hormonal interventions. Studies in animal models of preterm infants (preterm pigs) are coupled with infant cohort and intervention studies worldwide.

Porntiva Poorisrisak: Staff specialist, neonatologist, PhD, research premature infants on respiratory support.

Ragnhild Måstrup, clinical nurse specialist and researcher, RN, IBCLC, Ph.D. Main research topics are breastfeeding of preterm infants, recommendations for breastfeeding practices in NICUs, skin-to-skin contact, and pain assessment.





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|---------------------------------|----------------------------|
| 1. Christian Heiring | 15. Ane Lando |
| 2. Anne-Mette Bæk Jensen | 16. Maria Rasmussen Rinnov |
| 3. Susanne Søndergaard Kappel | 17. Rikke Louise Stenkjær |
| 4. Janne Weis | 18. Lise Aunsholt |
| 5. Porntiva Poorisrisak | 19. Gorm Greisen |
| 6. Sandra Meinich Juhl | 20. Per Torp Sangild |
| 7. Sofie Sommer Hedegaard | 21. Ragnhild Måstrup |
| 8. Charlotte Kruse | 22. Morten Breindahl |
| 9. Joan Neergaard Larsen | 23. Sanne Allermann Beck |
| 10. Gitte Hahn | 24. Simon Trautner |
| 11. Rasmus Skov Kolind | 25. Gustav Riemer Jakobsen |
| 12. Stine Lund | 26. Niklas Breindahl |
| 13. Emma Louise Malchau Carlsen | 27. Sunna G. Herrmann |
| 14. Mathias Lühr Hansen | 28. Mette Petersen |

Rikke Louise Stenkjær, clinical nurse specialist, RN, PhD-student in Department of Neonatal and Paediatric Intensive Care. Research in pediatric delirium in children aged 3 months to 18 years in five different units at Rigshospitalet.

Sandra Meinich Juhl, MD, PhD, pediatric resident. Previously performed a PhD with the prevention of NEC as primary focus with involvement in clinical nutrition- and microbiota-studies. Currently working on the SUGARNIRS-project.

Sanne Allermann Beck, Head nurse, RN, MScN, with research interest in empowerment of parents in the NICU and PICU.

Simon Trautner, consultant neonatologist, PhD. Research focus: Regulation of cardiovascular function in heart failure and other pathological states. Member of the steering committee of The Danish National Clinical Neonatal Database DKN, part of The Danish Clinical Quality Program – National Clinical Registries (RKKP). Member of The Collaboration of Nordic Neonatal Quality Databases. Member of the Copenhagen Baby Skin Research Group, investigating the processes of maturation of the skin barrier in premature and immature newborns, cutaneous inflammation markers and prediction of dermatological conditions in these babies.

Sofie Sommer senior registrar. Respiratory research focus.

Stine Lund, senior consultant, neonatologist, PhD. Her special area of research interest is infectious diseases in neonates, global neonatology, and the use of innovative technology particularly in training of health personnel. Funding received from Helsefonden and Region Hovedstadens Forskningsfond for health research.

Sunna Guðrúnardóttir Herrmann, RN, MN, CCRN and Clinical Nurse Specialist. Science field; Hygiene and infection prevention within neonatology.

Susanne Søndergaard Kappel, clinical nurse specialist and researcher, RN, PhD. Main research topics are feeding intolerance, motility and bowel habits in preterm infants.

Ulrik Lausten-Thomsen, senior consultant, neonatologist, PhD. Research focus on epidemiology of prenatal birth, on congenital surgical conditions, on neonatal pharmacology, and on various other epidemiological aspects of public health.

Pregraduate researchers

Anna Bjerager Arnesen, pregraduate student, investigating the incidence of severe infections in preterm infants in East Denmark, with the aim of providing new knowledge on early and late onset sepsis and the risk of reinfection, including the importance of maternal risk factors and intrapartum antibiotics.

Caroline Sophie Kleis Schmidt, research assistant and medical student. Bachelor thesis on how the COVID-19 Pandemic affected the East Danish NICUs. Partly responsible for the department's participation in the Vermont Oxford Network (VON).

Emma Therese Bay, pregraduate student, medical student, and research assistant. Currently conducting two Delphi studies aiming to achieve international consensus on technical skills needed by neonatologists, and interdisciplinary neonatal transport teams, respectively. Partly responsible for the department's participation in the Vermont Oxford Network (VON) and the department's social media channels.

Julia Galuszka, master's thesis investigating which events and characteristics during hospitalization in the Neonatal Intensive Care Unit that might be connected to a greater risk of getting a MRSA infection.

Marie Isabel Skov Rasmussen, medical student and PhD student, project manager of the SafeBoosC-III follow up study. Research areas include neurodevelopmental outcomes after preterm birth and research methodology.

Natascha Sofia Elsborg, medical student. Currently working on a research project, which examines how maternal health and social conditions may affect the composition of macronutrients and energy in breast milk, and, in turn, how this affects neonatal growth and health.

Ulrikke Lyng Beauchamp, medical student. Completed a research year at GN in September 2022 resulting in a master's thesis. Currently continuing this work, looking into bowel habits and laxative use in very and extremely preterm infants, and the possible influence of prenatal and perinatal events e.g., maternal antibiotics.

Sofia Augoustakis, Registered Nurse (RN) and Stud. Cur. Advanced Practice Nursing (APN). Science field; Nursing interventions, skin-to-skin contact and involvement of fathers in neonatal care. Special interest in bioethics in daily nursing practice.

Amalie Gudiksen, medical student. Currently working on a research project, which examines the amount of positive blood cultures at the Intensive Care Unit at Rigshospitalet from 2018-2023.

Maria Sofie Reinhardt Jähnel, medical student. Performing a scoping review to collect the current knowledge about the effect of HMOs on the infant gut microbiome during weaning



1. Marie Isabel Skov Rasmussen
2. Caroline Sophie Kleis Schmidt
3. Ulrikke Lyng Beauchamp
4. Julia Galuszka
5. Anna Bjerager Arnesen
6. Emma Therese Bay
7. Natascha Elsborg
8. Maria Sofie Reinhardt Jähnel
9. Amalie Gudiksen
10. Sofia Augoustakis
11. Sofie Loftager

Collaborative partners

We have active research collaboration with several national and international partners.

- Copenhagen University Hospital Rigshospitalet
- Copenhagen University Hospital Bispebjerg, Mental Health Center
- Odense University Hospital
- Aarhus University Hospital
- University of Copenhagen
 - Translational Pediatrics and Nutrition
 - Section for Microbiology and Fermentation
- Technical University of Denmark
- University of Aarhus
- Det Nationale Forsknings- og Analysecenter for Velfærd
- CAMES
- SCENE research network (Separation and Closeness Experiences in the Neonatal Environment)
- Neomune, NEOCOL
- Pampas
- Newcastle University, Newcastle Neonatal Service
- Erasmus MC – Sophia Children's Hospital, University Medical Center Rotterdam, Rotterdam, the Netherlands
- ICARS – International Center for Anti microbiological Resistance Public Health Laboratory- IdC Pemba, Tanzania

Fundraising

- Novo Nordisk Foundation
- Innovationsfonden
- Chiesi, Parma
- RH-OUH Puljen
- State Serum Institute
- Danish National Board of Health
- Danish Pediatric Society
- The Royal Academy
- A.P. Møller Foundation
- Copenhagen Medical
- ICARS – International Center for Anti microbiological Resistance Public Health Laboratory-IdC Pemba, Tanzania

Scientific production of 2022 and 2023

PhD thesis from the Interdisciplinary Research Unit of Neonatology

Susanne Søndergaard Kappel. Feeding Intolerance and Bowel Habits in Preterm Neonates, June 2022. Copenhagen University. Lise Aunsholt faculty PhD supervisor.

Bjørn Andresen. Optical measurements of cerebral hemodynamic in infants. Maj 2022.

Copenhagen University. Gorm Greisen faculty PhD supervisor.

Maria Rasmussen Rinnov. Biomarkers and Atopic Dermatitis in children. Marts 2023. Copenhagen University. Simon Trautner supervisor.



Susanne and the assessment committee



Maria and supervisor Simon

PhD Examinations

The department was in 2022 involved in PhD defences as chairmen, assessment committee or examination board members.

Danish PhDs:

Sisse Sundell Haslund-Krog. Off-patent medicine inadequately studied in children. December, 2022. Copenhagen University. Gorm Greisen as the chairman of the assessment board.

Scientific presentations 2022

- **Emma Malchau Carlsen:** Switch from intravenous to oral antibiotic treatment of term babies with early onset infection: a Danish prospective multicenter cohort study. @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.
- **Gorm Greisen:** 4 lectures on cerebral blood flow and oxygenation at the Ipocrates seminar on Neonatal haemodynamics @ Modena, Italy, June 2022.
- **Gorm Greisen:** 3 lectures @ EAPS, Barcelona, Spain, October 2022.
- **Gorm Greisen:** Clinical use of cerebral oximetry @ Neonatal Emergencies. Poznan, Poland, November 2022.
- **Gorm Greisen:** Cerebral oximetry and the SafeBoosC-project. @ Belgian Neonatal meeting. Grimbergen, Belgium, November 2022.
- **Joan Neergaard Larsen:** Single-family rooms in a neonatal intensive care unit: a thematic analysis of experiences from parents and nurses. @European Academy of Paediatric Societies (EAPS), Barcelona, November 2022.
- **Christian Heiring:** Neonatal and Paediatric interhospital transports in Capital Copenhagen. @ Børnedage, Danish Paediatric Society, Annual Meeting, May 2022
- **Gustav Riemer Jakobsen:** Fecal Filtrate Transfers in Preterm Infants. @ Gustav Riemer Jakobsen Life Cycle in Medicine Research Seminar, 2.-3. June 2022
- **Gustav Riemer Jakobsen:** Fækal filtrat transplantation til Tidligt fødte. @ Landssymposium i Neonatologi 24. September 2022.
- **Marie Isabel Rasmussen Abstract Title:** Feasibility of the web-based training and certification of clinical staff for the randomized clinical trial SafeBoosC-III. @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.
- **Morten Breindahl:** Development of a feedback culture at an intensive care unit. @ Educational Symposium at Rigshospitalet 2022, Copenhagen, Denmark, December 2022.
- **Morten Breindahl:** Interhospital neonatal transports - experiences from Denmark. @National Neonatal Transport Conference, Gothenburg, Sweden, November 2022.

- **Morten Breindahl:** Leading together - experiences on parent involvement, cross-professional leadership, and construction of a leadership group. @ The Capital Region's Leadership Conference 2022, November 2022.
- **Morten Breindahl:** Experiences from a clinical department with transformational leadership, recruitment and retention. @The General Assembly of the Union of Medical Consultants in Denmark, Hotel Munkebjerg, Vejle, Denmark, October 2022.
- **Morten Breindahl:** Subspecialist training in neonatology in Denmark. @ National Symposium on Neonatology, Svendborg, September 2022.
- **Morten Breindahl:** The necessity of patient monitoring systems in the ICU, CIMT. @Copenhagen, September 2022.
- **Morten Breindahl:** Highly specialized neonatology in Denmark - cooperation on a national scale. @Børnedage 2022, Roskilde, June 2022.
- **Morten Breindahl:** From idea to product - innovation in health care, ups and downs. @ The Nerd Committee, Rigshospitalet, March 2022.
- **Morten Breindahl:** Highly specialized neonatology in Denmark - what is needed. @ Online Guideline Meeting, DPS, February 2022
- **Morten Breindahl:** Highly specialised neonatology in Denmark - development and future perspective. Advisory Board for the Planning of Specialties in Denmark, Danish National Board of Health (Det Rådgivende Udvalg for Specialeplanlægning under Sundhedsstyrelsen), February 2022.
- **Niklas Breindahl:** Consensus on training and assessment of LISA competence in premature infants: A worldwide Delphi survey. @ Landssymposium i neonatologi. September 2022. Odense, Denmark
- **Niklas Breindahl:** Consensus on training and assessment of less invasive surfactant administration competence: An international Delphi survey @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.
- **Niklas Breindahl:** The NON-pharmacological Approach Less Invasive Surfactant Administration (NONA-LISA) trial. @ Öresundsmødet. November 2022, online.
- **Ragnhild Maastrup:** Nipple shield use in preterm infants. Invited speaker @ ELACTA conference, Bremen, Germany. Invited speaker, May 2022.

- **Ragnhild Maastrup:** First breastfeeding attempt in preterm infants: When and how? @ Rigshospitalet's Nursing Symposium, Copenhagen, September 2022.
- **Ragnhild Maastrup:** Pain assessment and treatment in hospitalized infants, children and young people @ National Symposium on Neonatology, Svendborg, September 2022.
- **Ragnhild Maastrup:** Pain assessment and treatment in hospitalized infants, children and young people @ EAPS, Barcelona, October 2022.
- **Ragnhild Maastrup:** Increased standard for early skin-to-skin contact. Danish Neonatal Qualitative Database @ Qualitative Conference, RKKP, Aalborg, November 2022.
- **Rikke Louise Stenkjaer:** Klinisk anvendelse af et redskab til deliriumscreening hos børn (SOS-PD) i Danmark: et feasibility studie. @ Rigshospitalets sygeplejesymposium, May 2022
- **Rikke Louise Stenkjaer:** Clinical application of "Sophia Observation Withdrawal Symptoms – Pediatric Delirium" screening tool Danish version: A feasibility study. @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.
- **Rikke Louise Stenkjaer:** Development of a non-pharmacologic delirium management bundle in pediatric intensive care units. @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.
- **Rikke Louise Stenkjaer:** Klinisk anvendelse af et redskab til deliriumscreening hos børn (SOS-PD) i Danmark: et feasibility studie. @ Region Hovedstaden intensivsygeplejesymposium, November 2022.
- **Rikke Louise Stenkjaer:** Udvikling af en non-farmakologisk intervention til forebyggelse og behandling af pædiatrisk delirium gennem en Delphi-undersøgelse. @ Region Hovedstaden intensivsygeplejesymposium, November 2022.
- **Sofie Sommer Hedeland:** LISA versus INSURE – implementing a new procedure. @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.
- **Susanne Søndergaard Kappel:** FortiColos – a multicenterstudy. @ National Symposium on Neonatology, Svendborg, September 2022.
- **Susanne Søndergaard Kappel:** Bovine colostrum fortification of human milk affects bowel habits in preterm infants (FortiColos study). @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.

- **Susanne Søndergaard Kappel:** FortiColos – a multicenter study. @ SIG-Neonatal temadag, Odense. Invited speaker, November 2022.

Scientific presentations 2023

- **Christian Heiring:** A multicenter, randomized trial of surfactant therapy guided by measurement of surfactant in gastric aspirate: a study protocol @ Congress of Joint European Neonatal Societies, Rome, September 2023.
- **Christian Heiring:** Prediction of the need for surfactant treatment using gastric aspirates at birth – clinical validation of a new POC-method @ Congress of Joint European Neonatal Societies, Rome, September 2023.
- **Christian Heiring:** Do intermittent sigh breaths during HFOV improve end-expiratory lung volume, distribution of ventilation and oxygenation in preterm infants? @ Congress of Joint European Neonatal Societies, Rome, September 2023.
- **Emma Bay:** Technical Skills Curriculum in Neonatology, poster presentation @ Conference for undergraduate and graduate medical research, Sønderborg, March 2023.
- **Emma Bay:** Technical Skills Curriculum in Neonatology, poster presentation @ “2023 Poster and Presentation Competition” hosted by “*The Collaboration of Young Researchers (FYF)*”, Copenhagen University Hospital, April 2023.
- **Emma Bay:** Technical Skills Curriculum in Neonatology, oral presentation @ Danish Neonatal Guideline Meeting 2023, April 2023.
- **Emma Bay:** Technical Skills Curriculum in Neonatology, poster presentation @ Congress of joint European Neonatal Societies (jENS), September 2023 .
- **Emma Bay:** A medical skills curriculum for interdisciplinary neonatal transport teams: A European Delphi consensus study, poster presentation @ Congress of joint European Neonatal Societies (jENS), September 2023.
- **Emma Malchau Carlsen:** Technical skills required by neonatal experts: a European Delphi study. @ Congress of joint European Neonatal Societies (jENS), September 2023.
- **Gorm Greisen:** Clinical use of cerebral oximetry – why not yet? @ 14th International Newborn Brain Conference. Florida. Febr-2023.
- **Gorm Greisen:** Four lectures @ Ipocrates: Prevention, protection, and repair of brain injury in neonates: a comprehensive practical approach. Tel Aviv. Febr-2023.

- **Gorm Greisen:** What is a realistic clinical benefit when testing a new intervention to improve brain outcomes? @ 13th Irish Neonatal research Symposium. Dublin. Marts-2023.
- **Gorm Greisen:** Five lectures @ Ipocrates: Neonatal haemodynamics. Porto. May-2023.
- **Gorm Greisen:** What outcomes should we be measuring in clinical trials? @ 8th International Neonatology Association Conference. Dublin. Sept-2023.
- **Gorm Greisen:** Does measuring cerebral oxygenation improve outcome? @ 8th International Neonatology Association Conference. Dublin. Sept-2023.
- **Gorm Greisen:** The cost of saving a newborn life. @ Congress of Joint European Neonatal Societies, Rome, September 2023.
- **Gorm Greisen:** Does measuring cerebral oxygenation improve clinical outcome? @ Cleveland Clinic Children's Brain Club. E-only. Oct-2023.
- **Gorm Greisen:** Cerebral oximetry in preterm infants. Should we be using it? @ Neonatal Update. London. Nov-2023.
- **Gustav Rimer Jakobsen:** Fecal Filtrate Transfers to Prevent Necrotizing Enterocolitis in Preterm Infants – The PrePhage Clinical Trial. @ Congress of joint European Neonatal Societies (jENS), Rome, September 2023.
- **Gustav Rimer Jakobsen:** The PrePhage study – Donor recruitment and safety of fecal filtrate transfers to prevent necrotizing enterocolitis.@ Congress of joint European Neonatal Societies (jENS), Rome, September 2023.
- **Joan Neergaard Larsen:** Protocol Implementation and evaluation of a mother-newborn Zero-separation intervention in high-intensive care. @ Separation and Closeness in Neonatal (SCEENE) Symposium, Grange-Over-Sands, April 2023.
- **Joan Neergaard Larsen:** Single-family rooms in a neonatal intensive care unit: a thematic analysis of experiences from parents and nurses. @ Maternal and Infant Nutrition and Nurture Unit (MAINN) Conference, Grange-Over-Sands, April 2023.
- **Joan Neergaard Larsen:** Neonatal homecare. @ SIG-symposium on Transistion, Odense, November 2023.
- **Joan Neergaard Larsen:** Single-family rooms in NICU. @ Neonatal Landssymposium, Sørup, September 2023.
- **Mathias Lühr Hansen:** Cerebral NIRS in the NICU. @ Congress of joint European Neonatal Societies (jENS), September 2023.

- **Morten Breindahl:** Feedback as a tool for psychological safety and development in an intensive care department, @ Leader-EmployerCommittee (LMU) for the Department of Haematology, Rigshospitalet. ComWell Holte, January 2023.
- **Morten Breindahl:** Importance of team cooperation in an intensive care unit. @ Committee on recruitment and retention (FRU), theCapital Region in Denmark, CAMES, Herlev, february 2023.
- **Morten Breindahl:** Challenges in blood sampling in the sick newborn and very preterm infant. @Radiometer, Copenhagen, may 2023.
- **Morten Breindahl:** Integration of research and innovation at the Department of Neonatal and Paediatric Intensive Care. @Rigshospitalet. Staff from the ENT Department, Rigshospitalet, august 2023.
- **Morten Breindahl:** Neonatology in the future. Society for young pediatricians (Yngre Pædiatere), @DPS, Middelfart, October 2023.
- **Morten Breindahl:** Leadership panel at the Capital Region's Leadership Conference.@ DR Byen, November 2023.
- **Morten Breindahl:** The Future of Neonatology-do we dare to look? @International Neonatal Conference, Kyiv, Ukraine, December 2023.
- **Morten Breindahl:** Re-inventing Leadership in the Department of Neonatal and Pediatric Intensive Care- from Hierarchy to Matrix. @International Neonatal Conference, Kyiv, Ukraine, December 2023.
- **Niklas Breindahl:** The NON-pharmacological Approach to Less Invasive Surfactant Administration trial (NONA-LISA): Protocol for a randomised controlled trial, @ Congress of Joint European Neonatal Societies, Rome, September 2023.
- **Niklas Breindahl:** Training curriculum and assessment tool for less invasive surfactant administration: an international delphi consensus study. @ Congress of Joint European Neonatal Societies, Rome, September 2023.
- **Niklas Breindahl:** Artificial Intelligence in paediatric Video Intubation (VITON-AI): A prospective observational pilot study. @ Østdansk neonatalmøde, September 2023.
- **Niklas Breindahl:** The NON-pharmacological Approach to Less Invasive Surfactant Administration trial (NONA-LISA): Protocol for a randomised controlled trial. @ Østdansk neonatalmøde, September 2023.
- **Ragnhild Maastrup:** First breastfeeding attempt in preterm infants. @ Maternal and Infant Nutrition and Nurture Unit (MAINN) Conference, Grange-Over-Sands, April 2023

- **Rikke Louise Stenkjaer:** Development of a non-pharmacologic delirium management bundle in pediatric intensive care units. @Nordic Child Intensive Care Symposium, Odense, Denmark, April 2023.
- **Rikke Louise Stenkjaer:** Prospective validation of Sophia Observation withdrawal Symptoms-Paediatric Delirium scale in critically ill children in Denmark'. @ESCAP, the European Society for Child and Adolescent Psychiatry, Copenhagen, Denmark, June 2023.
- **Rikke Louise Stenkjaer:** Prospective validation of Sophia Observation withdrawal Symptoms-Paediatric Delirium scale in critically ill children in Denmark. @ESPNIC, the European Society of Paediatric and Neonatal Intensive Care, Athen, Greece, June 2023.
- **Rikke Louise Stenkjaer:** Development of a non-pharmacologic delirium management bundle in pediatric intensive care units. @ESPNIC, the European Society of Paediatric and Neonatal Intensive Care, Athen, Greece, June 2023.
- **Rikke Louise Stenkjaer:** Paediatric Delirium in critically ill children in Denmark'. @Professional Society for Children and Adolescents in Demark, Middelfart, Denmark, October 2023.
- **Rikke Louise Stenkjaer:** Prospective validation of Sophia Observation withdrawal Symptoms-Paediatric Delirium scale in critically ill children in Denmark.@ Regions intensive nursing symposium, November 17, 2023.
- **Sunna G. Herrmann:** Hygiene efforts in light of an MRSA outbreak. @ National Symposium on Neonatology, Sørup Herregaard, Denmark, September 2023.
- **Sunna G. Herrmann:** Hygiene efforts in light of an MRSA outbreak in NICU. @ Infection Hygiene Comittee, Copenhagen University Hospital, Rigshospitalet, Copenhagen, September 2023.
- **Susanne Søndergaard Kappel:** Trial-related blood sampling and red blood cell transfusion in preterm infants. @ Congress of joint European Neonatal Societies (jENS), September 2023.
- **Ulrikke Beauchamp:** Prenatal Events and Bowel Habits in Preterm Infants: Observations from the First Two Weeks of Life. @ Congress of joint European Neonatal Societies (jENS), September 2023.



Morten Breindahl and Lise Aunsholt, charing the Öresundsmeeting 2023

Hosted meetings

November 2022 we, Morten Breindahl and Lise Aunsholt, hosted the Öresundsmeeting, this time as an online event. The topic was the Extreme Premature Infant and the First two weeks of Life, and rounded up with presentations of ongoing research within the Nordic countries. There were multiple esteemed speakers and during the break-out sessions active discussions between participants and speakers. More than 90 participants joined the meeting sponsored by Chiesi, who also organized the technical part of the meeting.

Scientific – and other - awards

Gustav Riemer Jakobsen: Best Oral Presentation @ Life Cycle in Medicine Research Seminar, 2.-3. June 2022, 15.000 kr.

Ragnhild Maastrup: Best ESPNIC NICU Nursing e-poster Award for 2022 @ European Academy of Pediatric Societies (EAPS), Barcelona, October 2022.

Per Torp Sangild: The Order of Dannebrog.

Gorm Greisen: The *Pediatric Research* reviewer award for the year of 2022.



Gorm Greisen and Ragnhild Maastrup

Emma Therese Bay: Best poster presentation @ Conference for undergraduate and graduate medical research, Sønderborg, March 2023.

Best speed-presentation @ Speed-presentation competition 2023 at the Department of Neonatal and Pediatric Intensive Care, Copenhagen University Hospital, May 2023.

Scientific publications 2022

1. Vedel, C., Jørgensen, D. S., Kristensen, D. M., Petersen, O. B., & Greisen, G. (2022). The use of paracetamol during pregnancy: A qualitative study and possible strategies for a clinical trial. *PLoS One*, 17(9), 1-7. [e0271537]. <https://doi.org/10.1371/journal.pone.0271537>
2. Stensgaard, C. N., Bech, C. M., Holm-Hansen, C., Skytte, T. B., Ali, S. M., Mohd, U. A., Kjærgaard, J., Greisen, G., Poulsen, A., & Lund, S. (2022). Essential newborn care practices for healthy newborns at a district hospital in Pemba, Tanzania: a cross-sectional observational study utilizing video recordings. *Global Health Action*, 15(1), [2067398]. <https://doi.org/10.1080/16549716.2022.2067398>
3. Stenkjær, R. L. (2022). Delirium hos kritisk syge hospitalsindlagte børn. I *Delirium* (1. udgave udg., s. 162-181). FADL's Forlag.
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