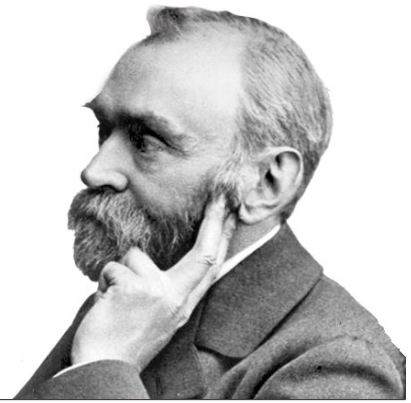


Örebro University's NOBEL DAY FESTIVITIES



BOOK OF ABSTRACTS

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Preface

The “Nobel Day Festivities” were established 2009 by Allan Sirsjö and Nikolaos Venizelos, researchers within Biomedicine, Department of Clinical Medicine (now School of Health Sciences and School of Medical Sciences) at Örebro University.

Every year, the Nobel Prize in Physiology or Medicine is awarded on the 10th of December, the anniversary of Alfred Nobel’s death. The School of Health Sciences and the School of Medical Sciences at Örebro University traditionally honour this day by organizing research activities and festivities.

The day includes scientific activities that are open for all, such as lectures, poster presentations and selected oral presentations by doctoral students, postdocs and specially invited students. All poster presentations are documented in this Book of abstracts.

We warmly welcome you to enjoy the research that will be presented at Nobel Day Festivities!

Table of Contents

Anna-Karin Bäck	5
Gabriela Campanher Pereira	6
Marek Czajkowski	7
Kaveh Dehlaghi Jadid	8
Julie Deprez	9
Tanja Duljic	10
David Fresnais	11
Anh Hoang Nguyen	12
Annalena Kamm	13
Asmatullah Katawazai	14
Evangelia Kerezoudi	15
Malin Lutteman	16
Ann Strandberg	17
Xiaoyu Tang	18
Ásgerdur Thordardóttir	19
Joel Thunberg	20
Lena Uvhagen	21
Jort Veen	22
Maria Wedin	23
Ulrika Westerling	24
Rongrong Wu	25

Bothered but in safe hands: patient experiences of diuresis renography

Anna-Karin Bäck^{1, 2)}, Håkan Geijer^{1, 2)}, Christos Savopoulos^{1, 2)}, Agneta Anderzén-Carlsson^{1, 3)}

1) School of Health Sciences, Örebro University, Örebro, Sweden.

2) Department of Radiology, Örebro, Sweden.

3) University Health Care Research Center, Örebro, Sweden.

Background/Objective: Diuresis renography is a common nuclear medicine examination that can distinguish between obstructive and non-obstructive uropathy (1). The examination methodology is well described (1) but not the patient perspective of the examination. The aim of the study was to gain knowledge of patient experiences throughout the diuresis renography process.

Method: The study had a qualitative descriptive design where data was collected through semi-structured interviews. Seventeen patients (21-82 years old) that had recently undergone the examination were interviewed. The transcripts were analysed using inductive qualitative content analysis to identify their manifest and latent content, by following the steps by Graneheim et al. and Lindgren et al. (2, 3).

Result: One main theme and three subthemes were identified. The main theme was: 'Not smooth all the way through but still in good hands'. The renography was not a straightforward examination. The participants understood the necessity of the examination and endured the examination despite inconveniences and worries. They were bothered by diuretic effects, worried of the word "radioactivity" and some felt isolated during imaging. However, the caring and informative approach by the nuclear medicine technologists eased their negative experiences. The main theme was identified from three subthemes: 'I experienced inconvenience', 'I was worried' and 'I felt safe' (4).

Conclusion: Communication and interaction between patient and technologist are important for creating a good experience. Improved knowledge of patient experiences during renographies could be used to develop patient information and increase technologists' awareness of factors patients may experience as troubling.

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The counteracting effect of chrysin on dietary fructose-induced metabolic disruption and hepatic injury in the rat

Gabriela Campanher Pereira^{1,2}

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) University of Porto, Portugal

Background/Objective: Metabolic syndrome incorporates an array of conditions such as type 2 diabetes, hypertension, non-alcoholic fatty liver disease, cardiovascular disease, and excessive abdominal adiposity, related to metabolic disruption. Its presence has been exacerbated by the exponential increase in obesity worldwide in the last few decades, particularly in developing countries amongst low-income households. Thus, there is an increasing need for affordable interventions for a population with lesser resources. Chrysin is a polyphenol found in an array of natural sources such as propolis. This project explores the effect of chrysin implementation on hepatic injury and hepatic and adipose tissue lipid and glucose metabolism in rats presenting metabolic syndrome-associated conditions.

Method: The study included 24 rats fed a standard chow diet and separated in 4 groups, treated for 18 weeks: the Control group (tap water), the Fructose group (tap water with 10% fructose), the Chrysin group (tap water + a daily dose of chrysin (100 mg/kg, p.o.) and the Fructose + Chrysin group (water with 10% fructose + a daily dose of chrysin (100 mg/kg, p.o.)). Quantitative histological analysis was performed on liver tissue for determination of hepatic lipid and glycogen storage. A NAFLD activity score (NAS) was assigned to all animals by evaluation of the degree of hepatic steatosis, lobular inflammation, and hepatocyte ballooning. qRT-PCR was performed on lipid and glucose metabolic markers in liver and adipose tissue. One-way ANOVA was performed followed by Student Newman-Keuls post-hoc test.

Result: Chrysin attenuated the increase in lipid and glycogen hepatic storage induced by the HFD. Additionally, it also decreased liver lipid storage in a chow diet. The NAS score was improved by chrysin in a HFD. Chrysin also promoted improvements in lipid (ACC, FAS) and glucose (HK2, GS, GK) metabolic markers in the liver and AT.

Conclusion: Our results suggest chrysin to be a beneficial addition to a daily diet in terms of improvement of hepatic health, by aiding in improvement of lipid and glycogen storage. Our results also show that chrysin affects liver and AT glucose and lipid metabolic markers. These results are particularly significant for individuals suffering from conditions related to metabolic syndrome.

Conflicts of Interest and Industry Funding Declarations in Systematic Reviews of Interventions for Six Common Diagnoses

Marek Czajkowski ^{1),2)}, Alexandra Snellman, Louise Olsson ^{1),3)}

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) AvestaHälsan Medical Centre, Avesta, Sweden

3) Centre for Assessment of Medical Technology in Örebro, Örebro University Hospital, Örebro, Sweden

Background/Objective: There is little data on how the prevalence of conflict of interest (COI) in systematic reviews of interventions for common diagnoses has evolved over time (1-2).

Method: PubMed was searched for systematic reviews on interventions for chronic obstructive pulmonary disease, type 2 diabetes mellitus, hypertension, dementia, major depression, and osteoarthritis published in 2010 and 2019. Two independent authors selected relevant systematic reviews. Basic characteristics, disclosures of COI, and funding sources were extracted by one author and partially checked by two others. An identified framework (1) was adopted for the categorization of declared COI, without any assessment of their validity.

Result: In total, 746 systematic reviews were included. One-third involved pharmacological interventions for both years, systematic reviews from China increased from 4% in 2010 to 21% in 2019, while those endorsed by Cochrane decreased from 19% to 4%.

Systematic reviews with a COI statement increased from 78% to 94%. Those with at least one author declaring individual financial COI decreased from 22% to 17% but remained at about 22% both years when systematic reviews from China were excluded. Almost one in three systematic reviews on pharmacological interventions and invasive procedures declared individual financial COI in 2019. Intellectual COI were declared in 2.5% systematic reviews in 2019, whereas other types of COI were very rare.

Systematic reviews with a funding statement increased from 65% to 81%, and funding from industry decreased from 6% to 3.4%. Including industry funding to the prevalence of systematic reviews with financial COI only made a marginal difference in both 2010 and 2019.

Conclusion: The proportion of systematic reviews on interventions for common diagnoses declaring individual financial COI remained at approximately one in five systematic reviews in both 2010 and 2019, while other COI and industry funding were rarely declared. This underscores the importance of further research on this topic.

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Postoperative Inflammatory Response in Patients Undergoing Laparoscopic and Robotic Rectal Cancer Resection

Kaveh Dehlaghi Jadid^{1)*}, Soran Gadan¹⁾, Göran Wallin¹⁾, Peter Matthiessen¹⁾

1) School of Medical Sciences, Örebro University, Örebro, Sweden.
Department of Surgery Örebro University Hospital

* = Equally shared authorship

Background/Objective: To investigate the postoperative inflammatory response in rectal cancer surgery as assessed by postoperative C-reactive protein (CRP) levels comparing conventional laparoscopy (LAP) and robotic assisted (ROBOT).

Method: Patients with clinical stage I-III rectal cancer undergoing curative abdominal resection at Örebro University Hospital during 2011-2021 were included. Data were obtained from the Swedish Colorectal Cancer Registry and local patient charts. Exposure was surgical technique; LAP compared with ROBOT. Primary outcome was CRP-levels on postoperative day (POD) 1-5. Secondary outcome was hospital stay. Patients with postoperative complications Clavien-Dindo ≥ 3 or hospital stay >14 days were excluded due to potential influence on postoperative inflammatory response.

Result: Some 520 patients were initially assessed; women 36%, ASA class ≥ 3 24%, median age 71 and BMI 25. LAP comprised 115 (22%), ROBOT 203(39%), and OPEN 202 (39%) patients. Tumour level was median 9 cm in LAP and OPEN, while 7 cm in ROBOT. The Clavien-Dindo complication rate grade $\geq III$ was 16% in LAP, 13% in ROBOT and 17% in OPEN. After exclusions, 253/318 patients remained and were analysed. Median CRP in LAP and ROBOT on POD 1-5 were; POD1: 48-34 (P=0.16); POD2: 88-83 (P=0.062); POD3: 109-74 (P=0.017); POD4: 71-63 (P=0.32); POD5: 66-56 (P=0.33), respectively (Mann Whitney U test). Median (Q1;Q3) hospital stay was 6 (5;8) in ROBOT and 7(6;9) in LAP (P=0.031).

Conclusion: The present study demonstrated a less pronounced inflammatory response in the early postoperative phase assessed as postoperative CRP levels and shorter hospital stay in robotic assisted compared with conventional laparoscopy in abdominal rectal cancer surgery.

Prognostic factors for the development of incontinence-associated dermatitis (IAD): A systematic review

Julie Deprez^{1,2}, Nils Ohde³, Alexandra Eilegård Wallin¹, Carina Bååth⁴, Ami Hommel⁵, Lisa Hultin⁶, Anna Josefson^{7,8}, Jan Kottner^{3, †}, Dimitri Beeckman^{1, 2, †}

1) School of Health Sciences, Örebro University, Örebro, Sweden.

2) SKINT, UCVV, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium

3) Institute of Clinical Nursing Science, Charité Universitätsmedizin, Berlin, Germany

4) Department of Health Sciences, Karlstad University, Karlstad, Sweden

5) Department of Care Science, Malmö University, Malmö, Sweden

6) Department of Public Health and Caring Sciences, Uppsala University, Uppsala, Sweden

7) School of Medical Sciences, Örebro University, Örebro, Sweden

8) Department of Dermatology, Örebro University Hospital, Örebro, Sweden

†= Equally shared supervision

Background/Objective: Incontinence-associated dermatitis (IAD) is an irritant contact dermatitis from prolonged contact with urine or faeces, which can significantly impact patient comfort and quality of life. The identification of prognostic factors for the development of IAD has the potential to enhance management, support preventive measures and guide future research.

Method: This study included prospective and retrospective observational studies or clinical trials that described prognostic factors associated with IAD. There were no restrictions on setting, time, language, participants or geographical regions. Exclusion criteria included reviews, editorials, commentaries, methodological articles, letters to the editor, cross-sectional and case-control studies, and case reports. Searches were conducted from inception to April 2024 on MEDLINE, CINAHL, EMBASE and the Cochrane Library. The studies were assessed by two independent reviewers using the QUIPS and the CHARMS-PF for data extraction. A narrative synthesis approach was employed due to study heterogeneity and using the 'vote counting based on direction' method and the sign test. The overall certainty of evidence was assessed using adapted GRADE criteria.

Result: The review included 12 studies and identified 15 potential predictors. Moderate-quality evidence suggests that increased stool frequency, limited mobility and friction/shear problems are risk factors for IAD development. Female sex, older age, vasopressor use and loose/liquid stool are risk factors supported by low-quality evidence.

Conclusion: Increased stool frequency, limited mobility and friction/shear problems seem to be risk factors for the development of IAD. There is insufficient evidence to support the predictive validity of female sex, older age, loose/liquid stool and vasopressor use. There is substantial methodological variability across studies, making it challenging to make comparisons. Large-scale cohort studies in different settings that incorporate our review findings should be conducted in the future.

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Patients' experiences with the application of medical adhesives to the skin: a qualitative systematic review

Hannelore Hofman² *, Tanja Duljic¹ *, Sara Johansson³, Jan Kottner⁴, Lise-Marie Kinnaer², Dimitri Beeckman², Mats Eriksson¹

1) School of Health Sciences, Örebro University, Örebro, Sweden.

2 University Centre for Nursing and Midwifery, Department of Public Health and Primary Care, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium

3 Creative Mammals, Gothenburg, Sweden

4 Institute of Clinical Nursing Science, Charité Center for Health and Human Sciences, Charité-Universitätsmedizin, Berlin, Germany

* = Equally shared authorship

Background/Objective: Medical adhesives provide securement of medical devices, facilitate skin protection and allow noninvasive monitoring. Application and removal of medical adhesives can result in pain, dermatitis, trauma or other skin lesions. Understanding patients' experiences when subjected to medical adhesives will contribute to the improvement of clinical routines and the development and improvement of new adhesive technologies.

Method: A qualitative systematic review was conducted to identify patients' experiences with the application of medical adhesives to the skin. CINAHL, EMBASE, MEDLINE and PsycINFO were systematically searched for records published between January 2012 and March 2024. Studies including qualitative data on the experience of patients with the application of medical adhesives to the skin were considered. The literature search identified 5463 records. After removing duplicates, 3102 articles were screened by using Covidence software. The eligibility of 160 full text articles was assessed, 151 studies were excluded. In total, 9 studies were included.

Study selection, data extraction and quality appraisal were independently conducted by two reviewers. The methodological quality of the studies was assessed using the Joanna Briggs Institute Critical Appraisal Tool for Qualitative Research. The extracted data was synthesized using meta-aggregation based on the Joanna Briggs Institute guidelines.

Result: The included studies described experiences with wound dressings. Meta-aggregation of the extracted findings resulted in seven categories that were further synthesized into two synthesized findings: 'Strategies to alleviate pain during dressing changes' and 'Dressing construction and characteristics'. The synthesized findings illustrate that patients experience pain during dressing change and removal and employ various strategies to alleviate this pain.

Conclusion: Patients' experience pain and discomfort when dressings are changed or removed. Future research should focus on enhancing both routines and technologies, with a particular emphasis on advancing skin-friendly adhesives to reduce unwanted side effects.

Statin Treatment for Cerebral Small Vessel Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

David Fresnais^{1,2}, Brynjar Fure^{1,2}

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Department of Internal Medicine, Central Hospital Karlstad, Karlstad, Sweden

Background/Objective: Cerebral small vessel disease (CSVD) is a chronic and progressive condition affecting small blood vessels in the white matter of the brain. White matter damage can be visualized as white matter hyperintensities (WMH) on magnetic resonance imaging and graded from 0 – 3 according to the Fazekas scale. The prevalence of CSVD increases with age, affecting a substantial proportion of persons aged > 65 years. In most cases, CSVD is sporadic and related to aging and cardiovascular risk factors including hypertension, diabetes and hyperlipidemia. Although CSVD is frequently asymptomatic, it causes 20% of stroke cases and nearly half of vascular dementia cases, making it a clinically significant issue. Statins, the most commonly used medication for lowering lipid levels, have been shown to reduce cardiovascular mortality in high-risk populations and are recommended by current guidelines for patients with both myocardial infarction and ischemic stroke. This systematic review and meta-analysis of randomized controlled trials was performed to study the effect of statin treatment on CSVD.

Method: A systematic literature search was performed in Pubmed, Embase and Cochrane Library. In total, 86 articles were reviewed in full-text, and four were included in the meta-analyses.

Result: Hazard ratio (HR) and odds ratio (OR) for progression of WMH according to Fazekas scale were significantly lower in persons treated with statins – HR = 0.48, 95% confidence interval (CI), 0.37 to 0.64; and OR = 0.41, 95% CI, 0.28 to 0.60. WMH-volume in milliliters was also lower in persons receiving statins compared to placebo, although not statistically significant – mean difference = -4.44, 95% CI, -10.19 to 1.31.

Conclusion: Statin therapy appears to reduce the burden of CSVD on radiological brain imaging. However, the present meta-analysis is based on few studies and the clinical benefits of statin therapy on cognition have not yet been elucidated.

Optimizing Patient-Centric Microsampling Workflows in Metabolomics for Advancing Personalized Healthcare

Anh Hoang Nguyen^{1)*}, Victor Castro-Alves²⁾, Daniel Duberg²⁾, Ellinor Almkvist²⁾, Tuulia Hyötyläinen^{2)†}, Matej Oresic^{1)†}

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) School of Science and Technology, Örebro University, Örebro, Sweden

* = Equally shared authorship †= Equally shared supervision

Background/Objective: Metabolomics captures a wide range of chemical information from human blood, providing valuable insights for clinical decision-making. The recent advancement of microsampling techniques enables patients to collect samples at home and send them to healthcare centers for analysis, creating opportunities to set up a patient-centric approach to healthcare. However, several challenges must be addressed to fully integrate microsampling into clinical metabolomics.

Method: In this work, we propose a patient-centric workflow for clinical metabolomics, focusing on key factors for successful implementation, such as evaluation of metabolome stability in microsampling, the development of simple extraction method, and the application of microsampling to monitor human metabolism. First, we evaluated the stability of the metabolome over time, simulating the transportation of samples to medical centers. Second, we established and evaluated a straightforward extraction method to determine its suitability for clinical metabolomics. Lastly, a pilot study involving a diet intervention was conducted to evaluate the microsampling's ability to capture dynamic metabolic changes.

Result: Our findings revealed that about half of the detected metabolites (e.g., amino acids) and lipids (e.g., glycerolipids) were unstable if samples were left at room temperature for more than one day, while the remaining metabolites remained stable over time. Compared to conventional methods, the newly developed technique demonstrated similar detectability and the potential for automated workflows. Furthermore, individual metabolic responses to the same meal varied significantly, highlighting the suitability of microsampling for capturing personalized metabolic dynamics.

Conclusion: In conclusion, our work demonstrates that microsampling holds great promise for implementation in patient-centric workflows. However, further standardization is needed to fully and accurately integrate it into clinical metabolomics and advance its potential for personalized healthcare

The Effect of Pea and Whey Protein Ingestion on the Blood Lipid Profile in Healthy Adults

Annalena Kamm¹⁾, Samira Prado¹⁾, Tatiana M Marques¹⁾, Dirk Repsilber¹⁾, Robert J Brummer¹⁾

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

Background/Objective:

Plant-based diets have been shown to positively affect the blood lipid profile and decrease the risk of developing cardiovascular disease. However, underlying mechanisms and personal influencing factors remain incompletely understood. The present study seeks to determine how pea protein concentrate, pea protein isolate, and whey protein isolate affect the blood lipid profile in healthy adults in a precision nutrition approach.

Method:

Fifty-six healthy adults completed the randomised and double-blinded 3-arm intervention study. Participants supplemented 0.5g of protein powder/kg bodyweight daily over 4 weeks. Data on body and diet composition was collected weekly. Additionally, plasma samples were taken before, in the middle, and after the intervention and were analysed for triglycerides, HDL, LDL and cholesterol. To investigate if the intervention and its duration affected blood lipids and if interactions were present, mixed-effects analyses and Tukey post hoc tests were applied ($\alpha = 0.05$).

Result:

The study participant's age and BMI ranged from 18-45 yrs (median = 29) and 18.0-29.6 kg/m² (median = 23.2), respectively and did not differ significantly between the arms.

Significant results were only observed for the duration of the intervention for all lipids. Multiple comparisons reached significance in arm C (still blinded) for LDL and cholesterol, showing lower levels after the intervention compared to before. When dividing individuals in arm C at the BMI median, the significant effect remained only for individuals with a BMI ≤ 23.2 kg/m².

Interestingly, the SD increased during the intervention in arm A for all lipids, indicating a diversity in subject specific responses.

To further elucidate individual factors driving the observed results, analyses are complemented in a personalised nutrition perspective with data on body and diet composition.

Conclusion:

Our results suggest that all tested proteins affect the blood lipid profile in healthy adults over time. Additional analyses are required to explore individual responses.

Impact of Minimal Incision Repair of Rectus Abdominis Diastasis (MIRRAD) on quality-of-Life and incontinence: A prospective study

Asmatullah Katawazai¹, MD PhD-student, Göran Wallin², MD Professor, Anna Ärlebäck³, MSc, Physiotherapist, Gabriel Sandblom⁴, MD Associate Professor

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Faculty of Medicine and Health, University Hospital Örebro

3) Olaus Petri Healthcare Centre, Örebro, Sweden

4) Department of Clinical Science and Education Södersjukhuset, Karolinska Institutet, Sweden

Background/Objective: This study evaluates the impact of the minimal incision repair of rectus abdominis diastasis (MIRRAD) procedure on physical activity, muscle strength, quality-of-life, and overall satisfaction in women with postpartum rectus abdominis diastasis (PP-RAD).

Method: A cohort of 31 female patients, aged 20-50 years, diagnosed with PP-RAD unresponsive to conservative treatment, underwent the MIRRAD procedure.

Assessments were conducted preoperatively and one year postoperatively, these included the Modified Abdominal Trunk Function Protocol (MATFP), Disability Rating Index (DRI), and Urinary Disability Index (UDI) questionnaires. Physical activity intensity was monitored using accelerometers.

Result: Significant improvements were observed in vigorous physical activities ($Z = -2.352$, $p = .019$), vector magnitude counts per minute ($Z = -2.163$, $p = .031$), and steps per minute ($Z = -3.131$, $p = .002$). DRI showed significant improvements in physical tasks like dressing, walking, and strenuous work (Z ranging from -2.705 to -4.603 , $p < .001$). UDI indicated significant improvements in urinary symptoms, including reduced frequency ($Z = -2.984$, $p = .003$) and less urinary leakage ($Z = -2.357$, $p = .018$). MATFP demonstrated gains in back and abdominal muscle strength ($Z = -4.321$, $p < .001$) and trunk stability ($Z = -3.991$, $p < .001$).

Conclusion: The MIRRAD procedure significantly improves physical strength, trunk stability, and urinary function, enhancing daily activities and overall physical health in women with PP-RAD. Further research is recommended to evaluate long-term outcomes.

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Impact of RG-I On The Microbiome Of Healthy Individuals: A Randomized, Double-Blind, Placebo-Controlled Intervention Trial.

Evangelia N. Kerezoudi¹⁾, **Gabriela Ciobotaru**¹⁾, **Anna F. Gisling**¹⁾, **Sue McKay**²⁾, **Annick Mercenier**²⁾, **Robert J. Brummer**¹⁾, **Ignacio Rangel**¹⁾

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Nutrileads BV, Bronland 12-N, 6708 WH Wageningen, The Netherlands.

Background/Objective: Rhamnogalacturonan I (RG-I) is a polysaccharide domain of pectin and is found in the cell walls of all plants (1,2). RG-I has demonstrated prebiotic properties in *in vitro* and *ex vivo* models and in a human intervention study (3,4). This study investigated the effect of RG-I supplementation, compared to placebo (maltodextrin), on markers of gut health in healthy adults.

Method: Participants of both sexes (18-70 years old), were pre-screened over two weeks for their average fiber intake (adapted Food Frequency Questionnaire) and their fecal bifidobacteria counts (qPCR) and characterized as high/low fiber intakers and high/low bifidobacteria abundant. Using these clusters, a computational algorithm assigned the participants in a randomized, double-blind manner to one of the intervention groups, i.e. 500 mg daily consumption of RG-I (N=26) or placebo (N=28) in capsule form for 4 weeks. During supplementation subjects' food's tolerance markers and health-related parameters were assessed. Differences between time intervals compared to baseline were analyzed via a GEE procedure.

Result: The analysis demonstrated that the outcomes were intricately linked to the initial baseline values of the evaluated variables. Furthermore, the randomization strategy employed effectively ensured that the supplementation groups were comparable across all measured parameters, including bifidobacteria counts, macronutrient intake and anthropometric indices, irrespective of the intervention administered. Importantly, RG-I supplementation was well-tolerated with no adverse effects noted, while no significant differences were observed in physical activity levels or overall health perception across groups.

Conclusion: The results underscore the critical necessity of accounting for baseline bifidobacteria numbers and habitual dietary fiber intake during pre-screening to optimize the randomization process in nutritional intervention trials. RG-I emerges as a safe and well-tolerated supplement, demonstrating significant promise for integration into functional food products aimed at enhancing gut health.

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Occupational therapists' experiences of working with patients with functional neurological disorder, FND.

Malin Lutteman^{1,2)}, Anna Rydén^{1,2)} & Kajsa Lidström-Holmqvist^{1, 2, 3)}

1) School of Health Sciences, Örebro University, Örebro, Sweden.

2) Department of neurology and rehabilitation medicine, Faculty of medicine and health, Örebro university

3) University health care research center, Faculty of medicine and health, Örebro university

Background/Objective: Functional neurological disorders (FND), means that a patient suffers from dysfunction in the nervous system without an underlying medical cause. There is a lack of evidence for occupational therapy treatments that are specific to patients with FND.

Aim The aim was to describe occupational therapists' experiences of working with patients with FND.

Method: Semi-structured interviews were performed with 14 participants. Data were analyzed with qualitative content analysis.

Result: The result are presented by two themes: *Experience and knowledge provide the conditions for helping a complex patient group* and *The occupational therapist's tool in treatment is activity and therapeutic use of self*. Participants with access to experience and knowledge in their professional role as well as through colleagues in care, have the conditions to help the complex patient group that patients with FND are perceived as. The participants use activity as a means throughout the treatment as well as therapeutic use of self in the interaction that arises in the joint dialogue with the patient with FND.

Conclusion: With their focus on the patient's abilities related to activity, the occupational therapist has a significant role in the multidisciplinary care of the patient with FND.

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Changes in platelet-derived biomodulating molecules and coagulation properties during storage of whole blood for transfusion.

Ann Strandberg^{1,2}, Sophy Bengts¹, Aseel Alshamari^{1,2}, Per Sandgren³, Nahreen Tynngård^{4,5}, Sofia Ramström¹.

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Department of Clinical Immunology and Transfusion medicine, Faculty of Medicine and Health, Örebro University, Sweden. 3) Department of Clinical Science, Intervention and Technology (CLINTEC), Karolinska Institutet, Stockholm, Sweden. 4) Department of Clinical Chemistry and Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden. 5) Research and Development Unit in Region Östergötland and Department of Health, Medicine and Caring Sciences, Linköping University, Linköping, Sweden

Background/Objective: During storage of whole blood units, biomodulating molecules can be released from platelets. These molecules may affect the product and thereby causing negative side effect in the patient transfused with whole blood. These platelet-derived molecules can be evaluated by collecting supernatant from whole blood. Furthermore, storage of whole blood might affect the coagulation properties of the product, which can be assessed using thrombin generation assays. By measuring the release of biomodulating molecules and changes in coagulation properties in whole blood we gain knowledge on the changes that occurs during storage which could provide valuable insight in how to optimize the use of this product.

Method: Ten units of whole blood were stored at 4° C and samples were taken on day 0, 1, 3, 7 and 14 of storage. For some units, one aliquot of blood was also pre-heated to 37° C for 15 minutes before collection of supernatants, to mimic the situation with pre-heating before transfusion. The samples were centrifuged(2500*g, 15 min), and supernatant frozen for later analysis using ELISA and thrombin generation with the automated calibrated thrombogram (CAT) assay. By ELISA, the concentration of RANTES, soluble P-selectin and platelet factor 4 (PF4) were measured. By thrombin generation, analysis of coagulation properties were assessed.

Result: Our results showed that the levels of RANTES and PF4 increased gradually in the stored units. Levels of soluble P-selectin varied already at day 0 and only approximately 50% of the units had a substantial increase with time. Thrombin generation increased with storage time, using reagents both with and without added phospholipids. However, the overall thrombin generation was lower than in normal pooled plasma at all time points.

Conclusion: In conclusion, we found that the supernatant from stored whole blood contained platelet alpha granule contents such as RANTES and PF4, and also soluble P-selectin, which shows that platelets get activated and release potentially bioactive molecules during storage. The thrombin generation capacity of the plasma was markedly decreased, even though a partial recovery was seen with increased storage time, likely due to release of procoagulant membranes from activated platelets. The relevance and potential consequences of these findings in the clinical context need further investigation and will be in focus for a planned clinical study on the subject.

Cost-effectiveness of preventive COVID-19 interventions: a systematic review and network meta-analysis

Xiaoyu Tang¹, Sun Sun², Mevludin Memedi³, Ayako Hiyoshi¹, Scott Montgomery¹, Yang Cao¹

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Department of Epidemiology and Global Health, Umeå University, Umeå, Sweden.

3) Centre for Empirical Research on Information Systems, Örebro University School of Business, Örebro, Sweden

Background/Objective: There is a knowledge gap regarding the effectiveness and utility of various preventive interventions during the COVID-19 pandemic. This study aims to evaluate the cost-effectiveness of various COVID-19 preventive interventions, including non-pharmaceutical interventions (NPIs) and vaccination programs, using real-world data across different demographic and socioeconomic contexts worldwide.

Method: Medline, Cochrane Library, Embase, and Web of Science Core Collection were searched from December 2019 to March 2024. Seventy-five studies were identified, which compared 34 COVID-19 preventive interventions. A network meta-analysis was conducted to assess the incremental net benefits (INB) of these interventions from both societal and healthcare system perspectives. Adjustment was made for purchasing power parity (PPP) and standardized willingness to pay (WTP) to enhance the comparability of cost-effectiveness across different economic levels. Sensitivity and subgroup analyses were performed to examine the robustness of the results.

Result: Movement restrictions and testing emerged as the most cost-effective strategies from a societal perspective, with PPP-adjusted INB values of US\$20,976.23 and US\$6,404.93, respectively. In contrast, combinations of NPIs with vaccination were less cost-effective, particularly in lower-income regions. From a healthcare system perspective, suppression and movement restrictions were highly cost-effective, while masking requirements were less economically viable. The effectiveness of interventions varied significantly across different economic contexts, underlining the necessity for region-specific strategies.

Conclusion: The study highlights significant variations in the cost-effectiveness of COVID-19 preventive interventions. Tailoring strategies to specific regional economic and infrastructural conditions is crucial. Continuous evaluation and adaptation of these strategies are essential for effective management of ongoing and future public health threats.

Maltreated Distal Radius Fractures: a review of patient claims to the Swedish National Patient Insurance Company 2011-2021

Ásgerdur Thórdardóttir, MD, ^{1,2)}, Marcus Sagerfors, MD, PhD ²⁾, Eva Lundqvist, MD, PhD ²⁾, Jonny Andersson, MD, PhD ³⁾

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Faculty of Medicine and Health, Örebro University, Department of Orthopedics and Hand Surgery, Örebro University Hospital, Örebro, Sweden Department of Orthopaedics,

3) Institute of Clinical Sciences, The Sahlgrenska Academy, University of Gothenburg, Atleva, Gothenburg Handcenter, Gothenburg, Sweden.

Background/Objective: Distal radius fractures (DRF) are the most common fracture. Treatment is primarily managed with cast (74%). Volar locking plate fixation is the most common operative treatment (90%). Failure in treatment or complications can lead to persistent disability. The aim of this study was to analyse maltreated DRFs regarding the most common complications, reasons for avoidance, demographics, indemnity for disability and direct costs for society.

Method: Claims filed to the Swedish National Patient Insurance Company (Löf) for DRF in adults (≥ 18 years) between 2011 -2021 were collected and analysed. Patient demographics (age, gender, injury classification and treatment) were data collected from Löf's register. Complications, failures and reoperations were assessed, along with the insurance reimbursement and medical invalidity documented.

Result: We found a total of 1,393 patient claims filed 2011-2021, applying for insurance compensation for failures in treatment. Settled claims were 64% (n=888) for DRF, compared with 42% overall claims. No specific trend was noticed in terms of annually filed claims, whilst Löfs overall claims increased by 6% annually. Treatment failures or complications were in total 1,637. The main treatment complications were malunion (50%) followed by nerve related complaints (19%), tendon complaints (17%) and osteosynthesis problems (14%). The median patient injury disability degree was 2% (0-22%). The total payment from Löf to the patients was €5,000,000.

Conclusion: Maltreated DRF are costly both for society and patients. The total number of claims is generally low considering the large amount of DRF annually. The main complications are malunions or tendon- and nerve related.

Comparative study of a Point-of-care test and an enzyme-linked immunosorbent assay (ELISA) for infliximab levels

J. Thunberg^{1,2}, O. Björkqvist³, M. Eberhardsson⁴, D. Bergemalm³, C. Eriksson², J. Halfvarson²

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

2) Department of Gastroenterology, Faculty of Medicine and Health, Örebro University, Örebro, Sweden,

3) Department of Laboratory Medicine, Clinical Microbiology, Faculty of Medicine and Health, Örebro

University, Örebro, Sweden,

4) Department of Medicine Solna, Karolinska Institutet, Stockholm, Sweden.

Background/Objective: Point-of-care test (POCT) devices for measuring concentrations of anti-tumour necrosis (TNF) agents, such as infliximab (IFX), have recently been developed to provide rapid and user-friendly measurements. We aimed to compare the agreement between a POCT IFX assay (ProCiseDx, San Diego, CA, USA) and the conventional in-house ELISA at Karolinska University Hospital, Sweden.

Method: Adult patients with inflammatory bowel disease treated with infliximab at Örebro University Hospital were prospectively recruited between June and December 2021. IFX levels were consecutively measured as part of the clinical routine using the in-house ELISA. After obtaining written informed consent, additional blood samples were collected, and the serum was separated and stored as aliquots at -80°C. After the inclusion of all patients, IFX levels were measured in a single batch using the POCT. Agreement between the two assays was visualised with a Bland-Altman plot. On the Bland-Altman plot, a good agreement is reflected by a horizontal line near the mean difference of zero. The Pearson correlation coefficient was also calculated. Values below the lower limit of detection (LOD), i.e. <0.5 µg/mL for the in-house ELISA and <1.7 µg/mL for the POCT, were substituted with LOD/√2.

Result: Sixty-one serum samples were collected and analysed. A significant correlation in IFX levels was observed when the POCT and the ELISA were compared ($r=0.95$, $p<0.001$). A Bland-Altman plot of all measurements is shown in Figure 1 and resulted in a bias of -0.77. Using the POCT, six measurements were below the LOD, and three of these were also below the LOD when the in-house ELISA was used.

Conclusion: The POCT showed no clinically relevant bias compared to the conventional ELISA but seemed to generate slightly higher IFX concentrations. However, the upper and lower limits of agreement in the Bland-Altman plot seemed clinically acceptable.

Mental well-being in Swedish adolescents 2014-2023

Lena Uvhagen^{1,2}, Johanna Gustafsson¹, Fredrik Söderqvist²

1) School of Health Sciences, Örebro University, Örebro, Sweden

2) University Health Care Research Centre, Faculty of Medicine and Health, Örebro University, Örebro, Sweden

Background/Objective: Mental well-being is more than merely the absence of mental illness; it is a multidimensional concept that includes both emotional and functional well-being. These are valuable resources in adolescence. Mental well-being can also act as a buffer against mental illness, which often emerge during adolescence. In order to develop relevant interventions and policies to strengthen adolescents' mental health, it is important to continuously monitor the well-being of the population. The aim of the study was to examine the level, distribution, and changes in mental well-being over time in a Swedish adolescent population.

Method: Current study is based on four waves (2014, 2017, 2020, 2023) of a cross-sectional student survey (n=16288). The survey was conducted in grade 9 of primary school and grade 2 of secondary school in Västmanland county, Sweden. The outcome was measured with the 14-item Mental Health Continuum Short Form, a self-report measure that includes three dimensions of positive mental health: emotional, social, and psychological well-being. Ten explanatory factors were selected to examine differences in mental well-being in the study population: grade, sex, sexual orientation, socioeconomic status, country of birth, visual, hearing or mobility impairment, specific learning disorder and neurodevelopmental disorder. Differences in mental well-being between groups and changes over time were examined and assessed using statistical tests and hierarchical linear regression modelling.

Result: Girls, non-heterosexuals, adolescents with low socioeconomic status and adolescents with impairments have lower levels of mental well-being than boys, adolescents with higher socioeconomic status and adolescents without impairments. No significant differences were observed between different grades or country of birth. The most significant factor for explaining the variation in mental well-being in this study was socioeconomic status. This association did not change over time. A deterioration in mental well-being over time was observed for several groups. However, the result of the multivariable analysis indicates that the deterioration is mainly an effect of sex and the significant decline in mental well-being seen among girls.

Conclusion:

- The study highlights both differences between social groups and deterioration over time in levels of mental well-being in the adolescent population.
- The overall differences are small, but as they affect a significant proportion of the population, they may nevertheless have a significant impact on public health.
- The results emphasise the importance of promoting mental well-being in adolescents, especially in vulnerable groups.

The “MiniMeal” study: a study protocol for a randomised controlled trial

Authors: Lina Tingö^{1,4}, Jort Veen¹, Myrto Chatzopoulou¹, Julia Rode^{1,3}, Kristina Andersson⁵, Isilay Kaya⁵, Ana Rascón^{5,6}, Peter Edholm^{3,4}, Robert Brummer¹, Cecilia Bergh^{*,2}, Ashley Hutchinson^{* 1*} Shared last authorship

1) Nutrition-Gut-Brain Interactions Research Center, School of Medical Science, Örebro University, Örebro, Sweden 2) Clinical Epidemiology and Biostatistics, School of Medical Sciences, Örebro University, Örebro Sweden, 3) School of Health Sciences, Örebro University, Örebro Sweden, 4) Department of Health, Medicine and Caring Sciences, Linköpings University, Linköping, Sweden, 5) Glucanova AB, Lund, Sweden, 6) Lund University, Department of Process and Life Science Engineering, Division of Food and Pharma

* = Equally shared authorship

Background/Objective: Increasing evidence suggests that diet may affect both the gut microbiota and systemic inflammation, which subsequently can affect brain health, cognition and mood regulation. Dietary interventions with anti-inflammatory food products such as oat bran and chickpeas have the potential to decrease low-grade inflammation and can improve older adult’s dietary behaviours. Therefore, this study protocol describes a randomised, controlled trial (The Minimeal study) in an older adult population, designed to investigate the effect of healthy in-between meal products on brain activity.

Method: The Minimeal study is a nine-week, three-arm, randomised, controlled trial that includes a double-blinded, two-armed intervention and a non-blinded, comparative arm without any intervention. A sample of 114 (38 per arm) community-dwelling men and women (70 years and older) will be randomised to one of the three groups. Participants in the intervention product group will consume the Minimeal products and the control group will consume reference products. In both groups, products will be consumed twice a day to replace or add on to their morning, afternoon, or evening in-between meals. Other dietary habits are to remain unchanged. The no-intervention group will maintain their habitual diet. The primary aim of the study is to assess whether the Minimeal products affect functional brain activity, as measured by functional magnetic resonance imaging, during the n-back task compared to the reference products. Secondary aims include comparing the intervention and reference groups to the no-intervention, control group and to investigate the effect of the intervention on other measures of health, including biomarkers in the blood, body composition, physical function, and self-reported well-being.

Result: Ongoing study.

Conclusion: Our Minimeal study will bring new insights regarding the effect of nutritious in-between meal food products on cognitive function in older adults, as well as exploring the underlying biological mechanisms. Furthermore, this intervention has the potential to impact older adults’ well-being and mental health, thereby promoting healthy ageing in general and reducing healthcare expenses.

Bone metastases in patients with small intestinal neuroendocrine tumours- do they matter?

Maria Wedin, MD, PhD student Örebro University^{1)*}, Göran Wallin, MD, professor Örebro University¹⁾

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

* = Equally shared authorship

Background/Objective: We aim to assess the symptoms and prognostic outcome on overall survival (OS) of bone metastases (BM) diagnosed on 68Ga-DOTATOC-PET/CT in patients with small intestinal neuroendocrine tumours (Si-NETs).

Method: Patients with well-differentiated Si-NETs, who underwent 68Ga-DOTATOC-PET/CT between 2010 and 2023 at Örebro and Uppsala University Hospitals in Sweden, were included. BM was classified as ≤ 5 BM and > 5 BM, including the prevalence of fractures and need of analgesics. To further evaluate the impact of BM on OS, we used a control group of age- and sex-matched Si-NET patients with liver metastases (stage IV disease) but no BM.

Result: The incidence of BM was 23 % of 753 Si-NET patients (n=175). A cohort of 138 Si-NET patients were extracted. Synchronous BMs were seen in 52 patients (38%). Sixty-one patients (44%) had > 5 BM at the time of BM detection. Fractures were present in 6 patients (4%) and 20 (14 %) of the patients needed analgesics for BM associated pain, commonly paracetamol combined with opioids. External beam radiation towards BM was given in 10 patients (7 %) for palliation. Survival was impaired in patients with > 5 BM (n=61; median OS 8.0) vs ≤ 5 BM (n=77; median OS 13.0 years; (log-rank $p < 0.001$)), synchronous BM (median OS 1.0 vs. 9.0 years; (log-rank $p < 0.001$)) and presence of BM in Si-NET patients with and without BM (median OS 6.0 vs. 24.0 years; (log-rank $p = .006$)).

In a multivariable analysis, proliferations index (HR=1.06, $p = .018$), age (HR=1.05, p -value=.006) and presence > 5 BM (HR=2.45, p -value= $< .001$), were independent prognostic factors for shorter OS in Si-NET patients with BM. In patients with stage IV disease with and without BM, age at stage IV diagnosis (HR=1.07, $p < .001$), presence of BM (HR=2.07, $p = .003$) and locoregional surgical resection (HR=0.47, $p = .008$) were independent prognostic factors for shorter OS.

Conclusion: 68Ga-DOTATOC-PET/CT frequently detects BM in Si-NET patients. Pain occurs in approximately 14% and fractures in 4%. The presence of BM among stage IV Si-NET patients, the extent of bone disease (> 5 BM) and synchronous BM are independent prognostic factors for shorter OS.

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Striving for partnership: Informal caregivers' experiences of support from a tailored primary health care unit

Ulrika Westerling¹, Mikko Hellgren¹, Liselotte Hermansson¹ and Emma Nilsing Strid¹

1) University Health Care Research Center, Faculty of Medicine and Health, Örebro University, Örebro, Sweden

Background/Objective: Informal caregivers are an essential part of the health- and social care systems worldwide, but face challenges in coping with their caring role. The aim was to describe informal caregivers' experiences and need of support from a tailored primary health care unit for people aged 75 years or older.

Method: Five focus group discussions were held with 16 informal caregivers recruited from a tailored primary health care unit for people aged 75 years or older in Sweden. Data was analysed with abductive content analysis.

Result: Through the lens of the patient-and family- centred care framework informal caregivers of older adults have unmet needs for support, and they strive to build a partnership with the primary health care professionals. An improved partnership between informal caregivers and professionals could enable informal caregivers to better cope with their caring role.

Conclusion: Professionals should view informal caregivers as important members of the care team and increase their efforts to integrate informal caregivers in the care of older adults. Collaboration is emphasised to reach a more coherent care provision for older adults. The patient- and family- centred care framework may function as guideline for professionals in primary health care collaborating with informal caregivers.

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Testosterone alters the virulence traits of Uropathogenic *Escherichia coli*

Rongrong Wu^{1)*}, Carolina Pettersson¹⁾, Isak Demirel^{1)†}

1) School of Medical Sciences, Örebro University, Örebro, Sweden.

* = Equally shared authorship †= Equally shared supervision

Background/Objective: Urinary tract infection, the majority caused by uropathogenic *E. coli*, is the most common infectious diseases in women. In Sweden, urinary tract infection accounted for more than 60% sick leave among all the infectious diseases in women. Recurring in urinary tract infection are often caused by the same uropathogenic *E. coli* from earlier or first infection, and we have found that the lower estradiol level, that represents to post-menopausal individuals, links to uropathogenic *E. coli* with enhanced biofilm production and suppressed immune function in bladder epithelial cells (ref). Understanding how urinary testosterone from the host affects the virulence of uropathogenic *E. coli* may be a new frontier in the fight against urinary tract infections (UTI). The overall aim of the project is to investigate the impact of testosterone and estradiol exposure on the virulence of Uropathogenic *E. coli* and the outcome of an UTI.

Method: CFT073 is a fully sequenced clinical isolated uropathogenic *E. coli*. We have investigated CFT073 growth, biofilm formation, type 1 fimbriae function and flagella function with or without testosterone (100pg/ml, 2ng/ml and 60ng/ml) pre-cultured in minimal salt medium. *C. elegans* were used to evaluate in general toxicity with virulence factors. Colonization and invasion assay were performed with bladder epithelial cell line 5637 and HBLPK.

Result: A spectrum of urinary levels of testosterone increase growth and biofilm formation in CFT073 within 24h in minimal salt medium. The strongest growth difference was observed from 6h until 12h. An induced biofilm formation by testosterone treatment was observed. Both cell lines showed enhanced invasion CFT073 after priming with testosterone. More colonization from testosterone primed CFT073 was observed in 5637 cells. Flagella swimming assay confirmed more migration distances with testosterone group. Taken together, testosterone levels from human urinary enhanced virulence factors function in CFT073. More aggregation was found with testosterone primed CFT073 in yeast aggregation assay, and faster death of *C. elegans* were observed, indicated aggressive virulence compared to CFT073.

Conclusion: Taken together, urinary testosterone level in females have a potential of modulation on UPEC virulence factors, and hence affect UTI and rUTI.

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