# Programma Wetenschap symposium

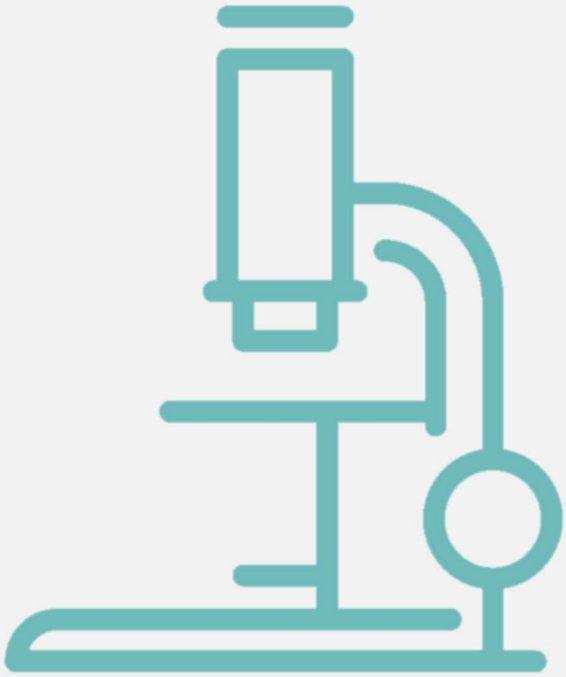
2024

Mienskip in Onderzoek

Dinsdag 19 november 2024

16.00 – 21.30 uur

Auditorium MCL



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Redactie: Wetenschapsbureau
Met dank aan alle abstract indieners

# **Voorwoord** *Mienskip in Onderzoek*

Beste lezer

Na meer dan 10 jaar is dit de laatste editie van het MCL wetenschapssymposium. Geen zorgen, we gaan gewoon door, maar we komen volgend jaar met een editie georganiseerd door het Frisius MC. De naamgever van de nieuwe fusie organisator, de Friese arts, Gemma Frisius, was een van de beste wetenschappers in zijn tijd. Dat we daarom dit mooie Friese medisch Wetenschap symposium aan zijn naam kunnen koppelen is dan ook een unieke kans.

Hoewel wetenschappelijk onderzoek doen soms best eenzaam kan zijn, is samenwerking cruciaal om tot mooie prestaties en onderzoeken te komen. Gemma is hier 500 jaar geleden al achter gekomen en zijn kracht was dan ook samenwerking met diverse andere top wetenschappers in Europa. Dat we samenwerking ook in steeds mooie vormen op het wetenschapssymposium terug zien komen is dan ook iets waar we als ziekenhuis erg trots op kunnen zijn.

Met de toename in samenwerking - binnen Friesland, binnen Nederland en ook internationaal - zien we ook de kwaliteit van de MCL publicaties elk jaar toenemen en we hopen dat dit symposium dat ook zal laten zien. Echter ook deelname vanuit de andere Friese ziekenhuizen is belangrijk en vorig jaar was het dan ook erg leuk om collega's van de andere locaties op het symposium te ontmoeten en we hopen als commissie dat ook dit jaar weer te mogen doen. We hopen dat deze ontmoetingen zullen resulteren in meer samenwerking en betere wetenschap op een manier die Gemma Frisius eer aan doet.

Mede namens de rest van het organisatiecomité, Paulien Lamsma, Nic Veeger en Edith Visser

Veel leesplezier,

Wouter van Geffen

## **Programma** *Mienskip in Onderzoek*

***Dagvoorzitter:*** *Dr. Wouter van Geffen*

| | |
|---|---|
| 16:00 – 16:20 | **Ontvangst** - Gelegenheid om posters te bekijken. |
| 16:20 – 16:30 | **Opening** |
| 16:30 – 16:45 | **Oral 1:** Time trends in case-mix and risk of revision following hip and knee arthroplasty in public vs private hospitals: a cross-sectional analysis based on 476,312 procedures from the Dutch Arthroplasty Register.<br>**Spreker:** Pelle Bos |
| 16:45 – 17:00 | **Oral 2:** Effects of a combined lifestyle intervention on recovery of ICU-survivors: a Randomised Controlled Trial.<br>**Spreker:** Pien Christiaanse |
| 17:00 – 17:15 | **Oral 3:** Occurrence and prognosis of incidental diagnosis in contemporary lung cancer care.<br>**Spreker:** Hiske Zeinstra |
| 17:15 – 17:45 | **Themalezing:** Meedenken door patiënten bij wetenschappelijk onderzoek.<br>**Spreker:** Hennie vd Veer |
| 17:45 – 18:15 | **5 short research presentations** - Power talks [1-5] |
| 18:15 – 18:45 | **Pauze met buffet** |
| 18:45 – 19:15 | **Poster sessie -** Gelegenheid om posters te bekijken. |
| 19:15 – 19:45 | **5 short research presentations** - Power talks [6-10] |

## Vervolg programma MCL Wetenschapssymposium dinsdag 19 november 2024.

| | |
|---|---|
| 19:45 – 20:00 | **Intermezzo -** Terugkoppeling IGJ wetenschapsaudit.<br>**Spreker:** Christiaan Boerma |
| 20:00 – 20.15 | **Oral 4:** Healthcare resource utilization in older patients with Acute Myeloid Leukemia treated with a hypomethylating agent with or without Venetoclax.<br>**Spreker:** Benno Diekmann |
| 20:15 – 20:30 | **Oral 5:** Improvement of bone mineral density and new vertebral fractures during 8 years of TNF-α inhibition in patients with axial spondyloarthritis.<br>**Spreker:** Mark Siderius |
| 20.30 – 20.40 | **PhD pitches:** korte presentaties van MCL-onderzoekers die afgelopen jaar gepromoveerd zijn. |
| 20:40 – 20:50 | **Publieksstemming en prijsuitreiking** “Beste short research presentation - Power talk”. |
| 20:50 – 20:55 | **Prijsuitreiking Auletiusprijs** voor beste wetenschappelijk onderzoek door de decaan van het MCL, prof. dr. Christiaan Boerma. |
| 20:55 – 21:00 | **Afsluiting symposium** |
| 21:00 – 21:30 | **Borrel en hapjes** met toast op winnaars Auletiusprijs, en beste Power talk. |

# Power Talks

17:45-18:15 **5 short research presentations** - Power talks [1-5]
4 minuten + 2 minuten voor één of twee vragen.

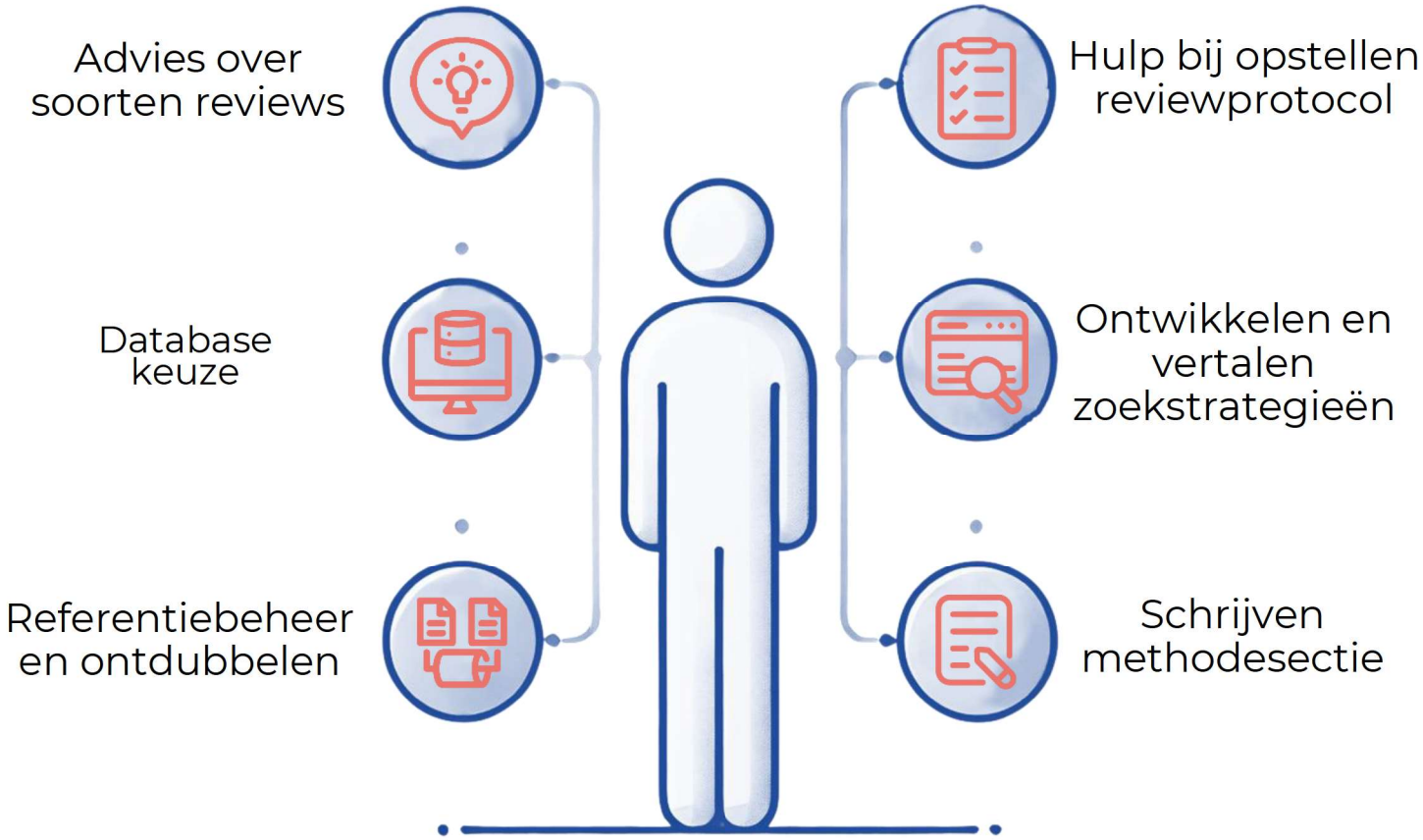
1. **Fréke Wink**
   Radiographic entheseal lesions at the pelvic region occur frequently in patients with radiographic axSpA and are associated with more severe spinal radiographic disease.
2. **Lianne ten Have**
   Real-world changes in fatigue in patients with severe asthma after starting anti-interleukin-4/13 biologic.
3. **Froucke van Gosliga**
   The effect of the implementation of a clinical decision support (CDS) tool on the percentage of adequately prescribed LMWH-thromboprophylaxis: an interrupted time series.
4. **Marije Vink**
   What is the most optimal bearing surface for minimizing instability after revision total hip arthroplasty? A systematic review and meta-analysis comparing (dislocation risk of) dual mobility, large femoral head and constrained bearings.
5. **Edward Yeo**
   Evaluating Post-COVID Care: A Retrospective Cohort Study into Long-Term Symptoms.

19:15-19:45 **5 short research presentations** - Power talks [6-10]
4 minuten + 2 minuten voor één of twee vragen.

6. **Tjitske Holtrop**
   Kiezen voor Beter, een onderzoek naar versterken van de invloed van verpleegkundigen op goede ziekenhuiszorg in een STZ-ziekenhuis (Medisch Centrum Leeuwarden).
7. **Kees Cirkel**
   Accuracy of a new automatic sensor system (ADEPTH®) for measuring drill hole depth in orthopedic surgery.
8. **Ilse Maltha**
   Association Between Oxygen Supply in Acute COVID-19 Infection and Long-COVID Syndrome.
9. **Tim Hoffman**
   Realtime kwantificatie van Laser Speckle Contrast Imaging tijdens laparoscopische darmchirurgie: Succesvolle demonstratie in preklinisch model voor darmischemie.
10. **Kenan Aydinoglu**
    Lower risk of acute kidney injury with use of SGTL2i in hospitalised patients: A retrospective propensity-matched cohort study.

# Samen naar Beter: Hoe Informatiespecialisten de Kwaliteit van Reviews verhogen

Een review vereist zorgvuldige planning, van de juiste vraagstelling tot een effectieve zoekstrategie en referentiebeheer. Informatiespecialisten helpen dit proces te optimaliseren en de kwaliteit te verbeteren. Ontdek waarbij zij kunnen helpen en hoe ze jouw review naar een hoger niveau kunnen tillen.




**Review kwaliteit is gemiddeld 15% hoger** met een informatiespecialist als co-auteur[2]

- Verbeterde reproduceerbaarheid
- Peerreview van zoekstrategieën
- Breder literatuuronderzoek
- Beter gedocumenteerde zoekprocessen

Wil je weten hoe een informatiespecialist jouw review kan versterken?

Neem contact op met het Kennis- en Informatiecentrum via:

- E-mail: kic@mcl.nl
- Web: vakliteratuur.mcl.nl
- Tel.: (058 286) 6420


Referenties:

1. Pawliuk, C., Cheng, S., Zheng, A., & Siden, H. (2024). Librarian involvement in systematic reviews was associated with higher quality of reported search methods: a cross-sectional survey. *Journal Of Clinical Epidemiology*, 166, 111237.
2. Rethlefsen, M. L., Farrell, A. M., Trzasko, L. C. O., & Brigham, T. J. (2015a). Librarian co-authors correlated with higher quality reported search strategies in general internal medicine systematic reviews. *Journal Of Clinical Epidemiology, 68*(6), 617–626.

Image:

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# 1 Oral presentations

## Time trends in case-mix and risk of revision following hip and knee arthroplasty in public vs private hospitals: a cross-sectional analysis based on 476,312 procedures from the Dutch Arthroplasty Register

Bart-Jan van Dooren[1,2], Pelle Bos[1], Rinne M. Peters[1,2,3], Liza N. van Steenbergen[4], Enrico de Visser[5,6], J. Martijn Brinkman[7], B. Willem Schreurs[4,8], Wierd P. Zijlstra[1].

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2. Department of Orthopedic Surgery, University Medical Center Groningen, the Netherlands.
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4. Dutch Arthroplasty Register (LROI), 's Hertogenbosch, the Netherlands
5. Department of Orthopedic Surgery, Canisius Wilhelmina Hospital, Nijmegen, the Netherlands.
6. Clinic for Orthopedic Surgery, Orthoparc Rozendaal, the Netherlands
7. Clinic for Orthopedic Surgery, Clinic ViaSana, Mill, the Netherlands
8. Department of Orthopedic Surgery, Radboud University, Nijmegen, the Netherlands.

*Presenter and shared first author:* Pelle Bos

**Background:** While public hospitals have traditionally been the primary providers of orthopaedic surgical procedures in the Netherlands, the role of private hospitals in healthcare services has grown [1]. This shift is driven by factors such as availability of services, extended waiting lists in public hospitals and personal preferences of patients. In addition to the growing need for arthroplasty, the COVID-19 pandemic had a strong impact on care, extending the waiting lists in public hospitals [2]. This study investigates the current situation of how and where the care for total hip and knee arthroplasty patients is performed in the Netherlands [3].

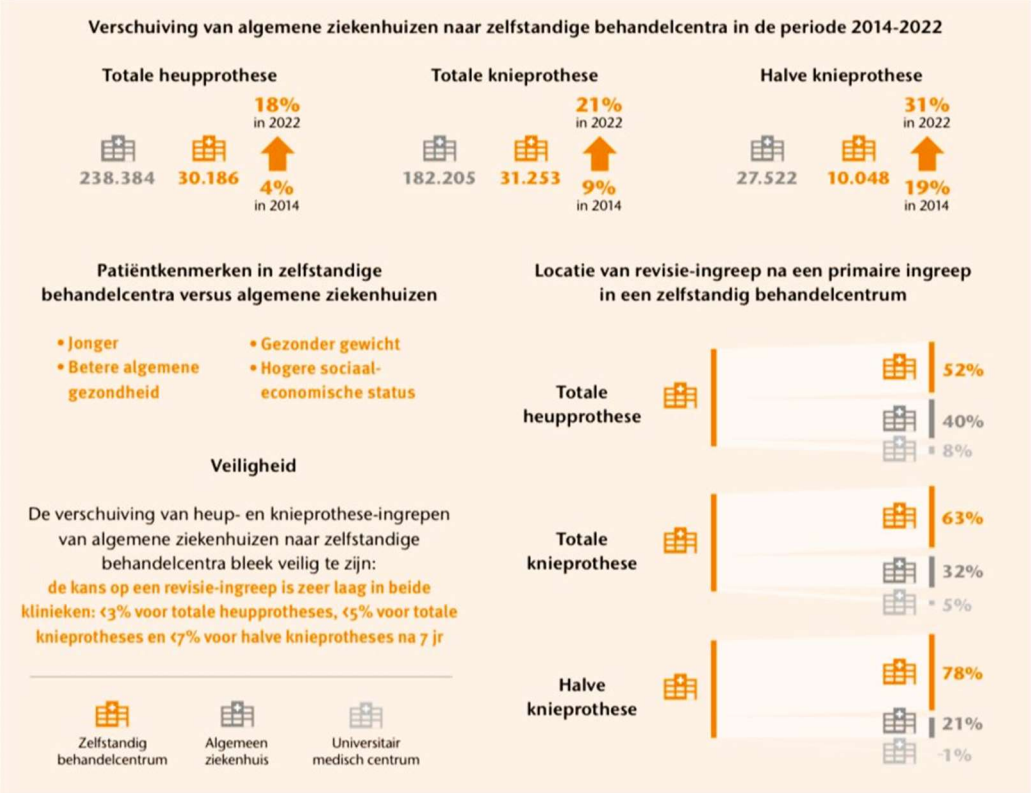
**Aim:** The aim of this study was to explore the shift from public towards private hospitals, patient and procedure characteristics (over time), the location and risk of revision following primary total hip (THA), knee (TKA) and unicompartmental knee arthroplasties (UKA) in the Netherlands.

**Methods:** We examined 476,312 primary THA, TKA, and UKA from 2014 to 2023 using Dutch Arthroplasty Register data. We explored patient and procedure characteristics, trends over time and location of revision per hospital type. We calculated the crude and adjusted revision risk for subgroups (ASA-I/II, age ≤ 75, BMI ≤ 30, OA diagnosis, and moderate to high SES) treated in both hospital types.

**Results:** THA and TKA volume in private hospitals increased from 4% and 9% in 2014 to 18% and 21% in 2022. Patients treated in private hospitals were younger, had lower

ASA-scores and BMI, and higher SES compared to public hospitals. In private hospitals, the mean age and proportion ASA-II patients increased over time. The majority of patients initially treated in public hospitals received their revision arthroplasty in a public hospital (95-96%). Conversely, when primary arthroplasty was performed in a private hospital, 49% of THA revisions, 37% of TKA revisions, and 24% of UKA revisions were performed in another type of hospital. Multivariable Cox regression demonstrated a lower revision risk for THA (HR 0.7, CI 0.7-0.8), TKA (HR 0.8, CI 0.7-0.9) and UKA (HR 0.8, CI 0.7-0.9) in private hospitals for the predefined subgroups.

**Conclusions:** Private and public hospitals clearly treat different patient populations. The number of arthroplasties increased in private hospitals, with a lower revision risk compared to public hospitals. Shifting towards private hospitals is safe in terms of revision rates, on the premise of proper patient selection and backup facilities.




**References:**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3. *Harris I, Cuthbert A, Lorimer M, de Steiger R, Lewis P, Graves SE. Outcomes of hip and knee replacement surgery in private and public hospitals in Australia. ANZ J Surg. 2019 Nov;89(11):1417-1423.*

# 2

## Effects of a combined lifestyle intervention on recovery of ICU-survivors: a Randomised Controlled Trial

Pien Christiaanse[1,2], Tim van Zutphen[2,3], Andrik Bolding[4], Rixt van der Werf[4], Corine de Jager[1], Christiaan Boerma [1,2], Lise Beumeler[1,2,5]

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[2] Department of Sustainable Health, Faculty Campus Fryslân
[3] Faculty Medical Sciences, University Medical Center Groningen, Groningen
[4] Department of Physical Therapy, Medical Centre Leeuwarden, Leeuwarden
[5] Digital Innovation in Healthcare, NHL Stenden, Leeuwarden

**Background:** Improved Intensive Care Unit (ICU) facilities and treatments have increased survival.[1] Yet, survival does not equal recovery. Post-ICU problems with physical functioning are associated with long-term loss of activities of daily living (ADL), reduced exercise, decreased health-related quality of life (HRQoL), and mortality.[2] Energy and protein needs vary during critical illness and recovery phase and current guidelines suggest a high-protein diet for recovery.[3] Unfortunately, ICU-survivors often do not meet intake criteria.[4] Evidence of beneficial outcomes as result of combined nutrition and exercise programs in ICU survivors remain scarce.[5]

**Aim:** The aim of this study was to investigate the effect of a combined lifestyle intervention programme on psychical functioning and HRQoL post ICU.

**Methods:** In this single-centre randomised controlled trial, adult long stay ICU survivors (≥ 48 hours) with a subscale score on the Dutch translation of the RAND-35 item Health Survey (RAND-36) Physical Functioning (PF) of <67% were included. Baseline and ICU characteristics were retrieved from electronic patients data files. The 12-week intervention included twice-weekly group exercise sessions and dietary advice, with protein supplementation provided as needed. The control group received no additional exercise or dietary support. The primary outcome was the PF subscale score after 12 weeks. Primary and secondary outcomes were assessed during a clinic visit at baseline and after 12-week period.

**Results:** A total of 38 patients were randomised in the intervention (n=19) and control group (n=19). Four participants withdrew prematurely. In this preliminary analysis 34 patients were included. Of the study population 9% identified as female, the median age was 62 [50-71] years, median Length of Stay (LOS) of 7 [5-12] days, and patients had a moderate illness severity (Acute Physiology and Chronic Health Evaluation III median score of 64 [IQR: 53-85]). There were some imbalances between groups regarding ICU LOS, days on mechanical ventilation and highest Sequential Organ

Failure Assessment (SOFA) score. However, no significant differences were found in baseline PF scores. At the end of the study, a significant improvement in PF was observed for patients following the combined intervention (*p*=.049). For the control group, no significant improvement was noted for PF. See Figure 1. Median daily protein intake increased from 82.3 [64.5-97.9] to 122.0 [110.0-145.9] gram per kilogram in the intervention group (*p*=.011). No change was observed for energy intake. The percentage of participants in the intervention group meeting recommended daily intake increased from 5% to 47% for protein, and from 26% to 47% for energy. Conversely, the control group revealed a decline of 11% to 0% and 32% to 29% for daily intake of protein and energy, respectively.

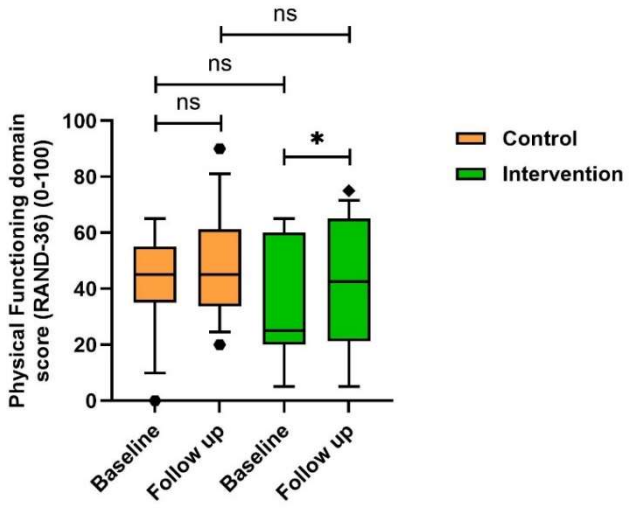


**Figure 1.** Physical functioning domain scores measured at baseline (t=0) and at follow up (t=12) presented in boxplot with 10-90$^{th}$ percentile whiskers. * p≤0.05.

**Conclusions:** This preliminary analysis showed improved PF in ICU survivors after a combined lifestyle intervention. Physical therapy and dietary supplementation may aid recovery in the most vulnerable, but further research is needed.

**References:**


1. *Hiser SL, Fatima A, Ali M, Needham DM. Post-intensive care syndrome (PICS): recent updates. J Intensive Care. 2023 May 23;11(1):23. doi: 10.1186/s40560-023-00670-7. PMID: 37221567; PMCID: PMC10202754.*
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# 3

## Occurrence and prognosis of incidental diagnosis in contemporary lung cancer care

Hiske Zeinstra[1], Ronald AM Damhuis[2], Maarten JJ Smeekens[3], Anne-Marije Buiter[4], Alinda L Zandsteeg[5], Wouter H van Geffen[1], Rolof GP Gijtenbeek[1].

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4. Department of Respiratory Medicine, Tjongerschans, Heerenveen, Netherlands
5. Department of Respiratory Medicine, Antonius Hospital, Sneek, Netherlands

**Background:** Lung cancer (LC) is still the leading cause of cancer mortality worldwide [1]. Early diagnosis of lung cancer improves survival, but LC is usually discovered at an advanced stage due to the low symptom burden in early stages [2] . Two factors that contribute to earlier detection are lung cancer screening programs and coincidental radiological findings that lead to the incidental diagnosis of LC. The current knowledge about incidental LC is primarily derived from older studies with selected cohorts. For example, the study of Kocher et al. [2] reported a 9.1% incidence of incidental diagnoses in their non-small cell lung cancer (NSCLC) population (2001-2009), and these patients had lower disease stages and better overall survival compared to symptomatic patients.

**Aim:** To assess the occurrence and prognosis of incidental diagnoses of LC in Frisia (2021) preceding the start of LC screening.

**Methods:** This real-world observational study included 523 patients diagnosed with LC in 2021 from all four hospitals in Frisia, a province of the Netherlands, using data from the National Cancer Registry. Clinical data was obtained from local medical records. During the study period, there was no lung cancer screening program in this region. Patients were classified as incidental depending on the absence of LC-related symptoms at diagnosis. Overall survival for the incidental and symptomatic diagnosed groups was analysed and compared using the Kaplan-Meier method.

**Results:** Incidental diagnosis was noted in 28.5% of patients, rising to 84.6% of patients with stage I disease. In the incidental group, patients were older, more often former smokers, and severe comorbidity was more common. General practitioners referred 46.5% of symptomatic cases versus 10.7% of incidental cases. Incidental pulmonary nodules constituted 52.3% of incidental diagnoses and more than one third was related to the staging or surveillance of other malignancies. Only 35.2% of patients with incidental diagnoses would have been eligible for participation in a LC screening

program. The 2-year survival rates were 65.7% (95% CI 57.5-72.7) and 22.2% (95% CI 18.1-26.3) ($p$<.001) for incidental and symptomatic diagnoses, respectively. Survival rates were similar after stratifying for stage of disease ($p$=.87).

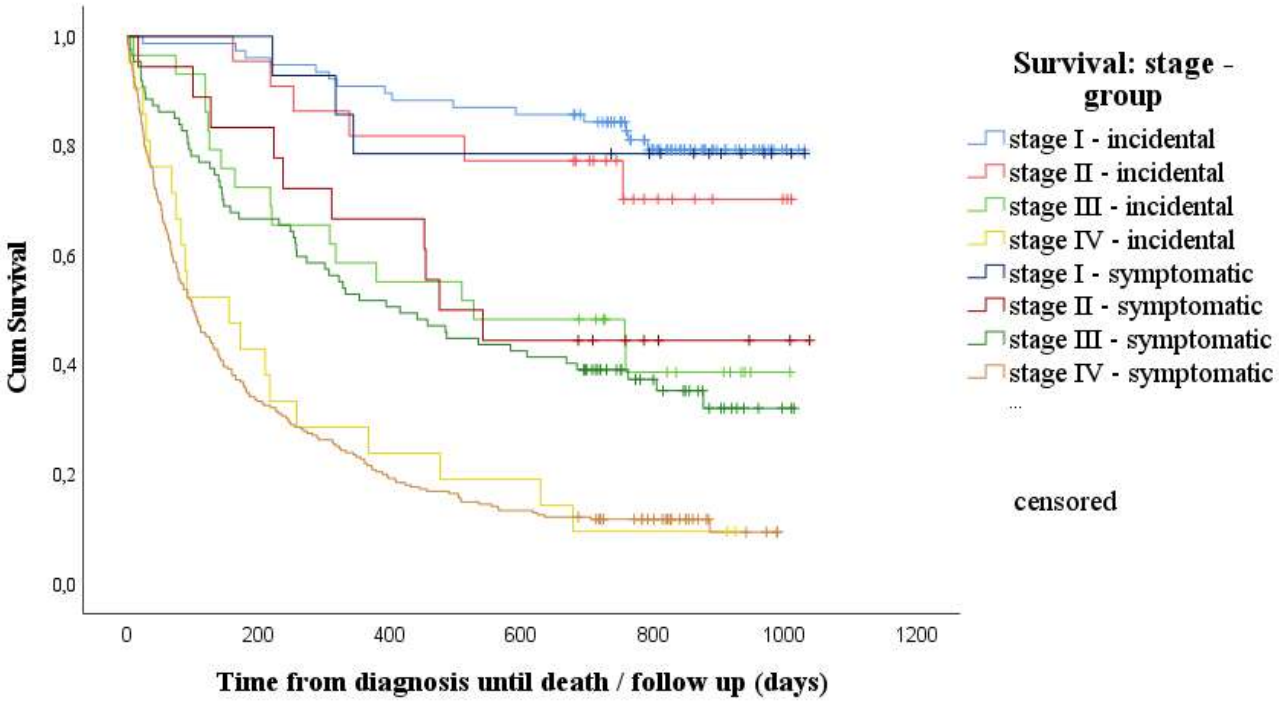


**Figure 1:** Cumulative survival curves for the symptomatic group and the incidental group per disease stage, measured from day of diagnosis until day of death or follow up. *censored: patient still alive at the end of follow up.

**Conclusions:** This study in Frisia (2021) revealed a high incidence rate of 28.5% incidentally diagnosed LC patients among the entire LC population, exceeding the rates reported in past studies. While patients in the incidental group had significantly higher survival rates, this is likely entirely attributable to the overall lower disease stage in this group. Patients in the incidental group were often ineligible for a LC screening programme. The results encourage further research about incidental LC diagnoses after screening implementation in the Netherlands.

**References:**


1. *Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin 2021: 71(3): 209-249.*
2. *Kocher F, Lunger F, Seeber A, et al. Incidental Diagnosis of Asymptomatic Non-Small-Cell Lung Cancer: A Registry-Based Analysis. Clin Lung Cancer 2016: 17(1): 62-67 e61.*

# 4

## Healthcare resource utilization in older patients with Acute Myeloid Leukemia treated with a hypomethylating agent with or without Venetoclax

Benno Diekmann[1,2,3,4], Jurjen Cornelissen-de-Beer[1,2], Nic Veeger[3], Eric van Roon[1,2], Mels Hoogendoorn[4]

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2. Medisch Centrum Leeuwarden, Ziekenhuisapotheek
3. Medisch Centrum Leeuwarden, Academie
4. Medisch Centrum Leeuwarden, Interne Geneeskunde, Afdeling Oncologie

**Background:** In march 2022 the combination regimen of either Azacitidine (AZA) or Decitabine (DEC) with Venetoclax (VEN) replaced AZA or DEC monotherapy as the first-line treatment option for patients with newly diagnosed Acute Myeloid Leukemia (AML) deemed ineligible for intensive chemotherapy[1]. The Zorginstituut Nederland modelled the costs at 74,031 €/QALY[2]. VEN adds both on-target toxicity as well as off-target toxicity, likely resulting in higher response and remission rates, but also prolonged states of deep pancytopenia[3]. This likely impacts the intensity and cost of the overall care for patients with AML besides the added cost of VEN itself.

**Aim:** We aim to measure the healthcare resource utilization (HRU) of patients with de novo AML treated with a hypomethylating agent (HMA) with or without VEN. We aim to quantify both the direct and indirect costs of VEN treatment, calculate the price per quality adjusted life year (QALY), the Incremental Cost Effectiveness Ratio (ICER) of the new treatment, as well as to illustrate treatment intensity and time toxicity.

**Methods:** A retrospective single center cohort study was conducted using HemoBase for patient identification and the electronic patient dossier of the Leeuwarden Medical Center as data source. Supportive care items deemed economically relevant and traceable (e.g. transfusions, blood sampling, bonemarrow analysis, hospitalization days, consultations) were selected and assigned a price based upon hospital pricelists and the iMTA costing tool[4]. Baseline (age, mutation status, fitness score, comorbidity) and outcome (survival, remission, stemcel transplantation) data were gathered for survival analysis. Survival time was discounted with an established Health State Utility Value of 0.68 for QALY, €/QALY, and ICER calculations[5].

**Results:** All patients with de novo AML aged 65 and older at diagnosis without further selection criteria that were treated with VEN in the 18 month after its introduction were included in the intervention arm (7 AZA+VEN, 21 DEC+VEN). The first 25 patients from 2016 treated with AZA or DEC monotherapy were included as the comparison

arm (9 AZA,  21 DEC). In table 1 the baseline characteristics, clinical outcomes, average treatment costs, and calculated ICERs are displayed. The study population is comparable to literature, the patients in the HMA+VEN arm however reach superior outcomes compared to literature[1]. The ICER for HMA+VEN against HMA alone found in the Leeuwarden Medical Centre is 43,395 € per QALY gained, indicating that the treatment is significantly more cost effective than predicted by the Zorginstituut. Although HMA+VEN patients require more bonemarrow biopsies, they require less cycles of chemotherapy and ultimately less supportive care overall. The inclusion of the traced supportive care costs reduced the ICER to 5,822 €/QALY, indicating that lower HRU costs in the HMA+VEN arm partially compensate for the costs of adding VEN.

**Table 1.** Baseline characteristics

| | **AZA+VEN & DEC+VEN** | **AZA mono & DEC mono** |
|---|---|---|
| *n* | 28 (7 AZA, 21 DEC) | 25 (6 AZA, 19 DEC) |
| *m Age at diagnosis* | 74 (range 68-83) | 74 (68-84) |
| *Male%* | 68% | 84% |
| *n ELN2017 Fav/Int/Adv* | 4/5/19 | 3/5/17 |
| *HCT-CI 0-2 / 3-4 / 5+* | 11 / 11 / 6 | 9 / 15 / 1 |
| *m number of cycles* | 4 (range 1-19, IQR 2-8) | 8 (range 1-24, IQR 3-14) |
| *m observation time* | 13 month | 11 month |
| *n patients still alive* | 16 | 5 |
| | **Clinical Outcomes** | |
| *% remission (CR/CRi)* | 71% | 36% |
| *m OS (KM-estimator=0.5)* | 17 month | 8,3 month |
| *n Stemcel transplantation* | 1 (4%) | 1 (4%) |
| *avg. Time toxicity* | 6 days per month | 8,3 days per month |
| *m QALYs gained* | 0.80 | 0.50 |
| | Average Treatment Costs | |
| *avg. cost chemotherapy* | € 40,530 | € 27,240 |
| *avg. cost supportive care total* | € 70,629 | € 82,136 |
| *avg. cost bonemarrow biopsy* | € 4,757 | € 1,826 |
| *avg. cost erythrocyte bags* | € 4,302 | € 7,309 |
| *avg. cost thrombocyte bags* | € 4,892 | € 9,237 |
| *avg. cost personnel oncology* | € 44,163 | € 47,859 |
| | **Incremental Cost Effectiveness Ratio** | |
| *ICER chemotherapy* | 43,395 €/QALY | |
| *ICER chemo & supportive care* | 5,822 €/QALY | |

**Conclusions:** Overall the case of VEN highlights the added value of novel targeted therapy agents for rare oncological diseases. It is also an encouraging example of oncologists deviating from patent holder dosing recommendations to the advantage of both patients and taxpayers. Postclinical research involving patient reported outcome measures is needed to account for possible differences in quality of life between the two treatments.

**References:**


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# 5

## Improvement of bone mineral density and new vertebral fractures during 8 years of TNF-α inhibition in patients with axial spondyloarthritis

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**Background:** Axial spondyloarthritis (axSpA) is a chronic inflammatory rheumatic disease which mostly develops in young adults and predominantly affects the axial skeleton. As a result of inflammation, both excessive bone formation of the cortical bone and loss of bone density of the spongy bone are frequently observed in the axial skeleton and bone-related outcomes are often negatively impacted in axSpA (1). Decreased BMD and worsened bone architecture (loss of trabecular bone) give rise to an increased risk for the development of vertebral fractures (VFs) in r-axSpA patients (2). Treatment with biological disease-modifying anti-rheumatic drugs, preferably TNFi, is advised in patients who have persisting high disease activity on conventional therapy. Studies assessing the early effects of TNFi treatment reported significant improvement of LS BMD within 6 months after start of therapy and continuous improvement until 3 years of treatment (3). A systematic review and meta-analysis of 8 studies showed a mean increase in LS BMD of 5.1 % after 1 year and 8.6 % after 2 years of TNFi (4). Until now, however, no data are available on more long-term TNFi treatment to explore whether this improvement in BMD is maintained and whether the development of new or progression of existing VFs can be prevented in r-axSpA patients.

**Aim:** To evaluate the long-term course of BMD and the development of radiographic VFs during 8 years of TNFi treatment in r-axSpA patients in daily clinical practice

**Methods:** Consecutive axSpA patients from the GLAS cohort receiving TNFi for ≥8 years were included. Patients who received anti-osteoporotic treatment were excluded. Lumbar spine (LS) BMD was assessed at baseline, 1 year and bi-annually using DEXA. Radiographic VFs were evaluated using the Genant classification.

**Results:** 126 axSpA patients were included; 75 % male, mean age 42 ± 11 years, ASDAS 3.8 ± 0.8, median LS BMD Z-score -0.5 (IQR -1.4-0.7) and 20 % had radiographic VFs at baseline. Disease activity improved rapidly and sustained. LS BMD Z-score improved significantly up to 4 years compared to the previous time point and sustained thereafter. Median percentage of improvement compared to baseline was 8.9 % (2.8-

15.8) and 7.2 % (2.2-14.7) after 4 and 8 years, respectively. Of 90 patients with baseline and 8-year radiographs, 14 (16 %) developed new VFs and 5 (6 %) showed an increase in severity of existing VFs. Of all 44 VFs present at 8 years, 30 % were grade 2 (n = 12) or grade 3 (n = 1).

**Conclusion:** In r-axSpA patients treated with TNFi for 8 years, LS BMD Z-score increased significantly, especially during the first 4 year of treatment. Radiographic VFs continued to develop or progressed, irrespective of improvement in BMD. Therefore, clinical attention for trabecular bone loss is important in daily clinical practice.

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# Themalezing

## Meedenken door patiënten bij wetenschappelijk onderzoek

*Mw. H. van der Veer*

Om wetenschappelijk onderzoek te kunnen doen naar betere zorg voor patiënten, zijn patiënten nodig. Toch is het niet altijd makkelijk om voldoende patiënten te vinden om deel te nemen aan onderzoek.

Het is dan ook niet altijd duidelijk voor patiënten wat voor- en nadelen zijn van het meedoen aan onderzoek. Een PIF is vooral een juridisch document waar patiënten over het algemeen weinig van begrijpen. Over hoe je zorgt voor begrijpelijke informatie over een onderzoek, wat patiënten zelf vinden dat er moet verbeteren in de zorg, wat patiënten als belastend ervaren en hoe je ze kunt betrekken gedurende onderzoek, daarover vertelt Hennie van der Veer.

Hennie heeft longkanker en is vrijwilliger bij patiëntenorganisatie Longkanker Nederland. Hennie licht toe wat ervaringsdeskundigen, zoals zij zelf is, kunnen bijdragen aan onderzoek en hoe Longkanker Nederland onderzoeken onder de aandacht brengt bij patiënten.

# 1 Power talk

## Radiographic entheseal lesions at the pelvic region occur frequently in patients with radiographic axSpA and are associated with more severe spinal radiographic disease

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**Background:** The sacroiliac joints and the spine are predominantly affected in axial spondyloarthritis (axSpA). Peripheral manifestations such as arthritis, dactylitis and enthesitis are reported in up to 66% of the patients.[1] Enthesitis is the most frequently reported peripheral SpA feature and is associated with more severe outcome.[2] Consequently, it is important to recognize entheseal involvement and to take this into account for treatment decisions. Entheseal involvement in (ax)SpA is often assessed by clinical examination. Besides local tenderness at the entheseal insertion during palpation, limited other inflammatory characteristics are present, which makes it difficult to discriminate between inflammatory and non-inflammatory involvement. Imaging techniques may be of additional value. Conventional radiographs may show signs of entheseal structural damage, whereas ultrasound (US) and magnetic resonance imaging (MRI) can provide information on signs of entheseal inflammation, but structural damage is limited visible.[3,4] Although US and MRI are becoming more accessible, they are more time consuming and expensive. Several studies in radiographic axSpA (r-axSpA) have shown that the presence of enthesophytes on US is associated with radiographic spinal damage, reflected by higher modified Stoke Ankylosing Spondylitis Spine Score (mSASSS) and more syndesmophytes.[5] As far as we know, there are no studies on entheseal involvement of the pelvis and hip region on conventional radiographs in r-axSpA in comparison to healthy subjects, although these radiographs are available in almost all axSpA patients.

**Aim:** To assess the prevalence of radiographic entheseal lesions at the hip and pelvic region in patients with r-axSpA compared to controls and to explore the association with patient and disease characteristics.

**Methods:** Anterior-posterior pelvic radiographs of consecutive r-axSpA patients starting TNFi were randomized with 100 pelvic radiographs from age- and sex-matched controls. Radiographs were blinded for patient information and sacroiliac joints and were evaluated for erosions/cortical irregularities, enthesophytes and

calcifications by 2 trained readers at the following locations (left and right): greater and lesser trochanter, os ischium and iliac crest.

**Results:** 127 (76%) of the included 167 r-axSpA patients and 58 (58%) controls showed radiographic entheseal lesions. At all 4 locations, r-axSpA patients showed significantly more entheseal lesions than controls, with more often bilateral involvement. Most lesions were found at the os ischium and the most prevalent type of lesions were erosions/cortical irregularities in both r-axSpA patients and controls (66% vs 53% and 72% vs 51% respectively). In r-axSpA, calcification was the most specific type of lesion. Patients with entheseal lesions were significantly older, had longer symptom duration and more spinal radiographic damage than patients without lesions. Enthesophytes were found significantly more often in patients with BMI ≥25.

**Conclusion:** Radiographic entheseal lesions at the hip and pelvic region were significantly more prevalent in r-axSpA than controls and independently associated with longer symptom duration and more severe spinal radiographic damage.

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# 2

## Real-world changes in fatigue in patients with severe asthma after starting anti-interleukin-4/13 biologic

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**Background:** Fatigue is highly prevalent in patients with severe asthma and contributes to the burden of disease, which makes it an important outcome from a patients perspective.[1-2] Dupilumab, an anti-interleukin-4/13 biologic, significantly improves clinical outcomes, such as asthma control, in severe eosinophilic asthma.[3-4] However, the real-world effect of dupilumab on fatigue in unknown.

**Aim:** To explore changes in fatigue during 12 months after starting dupilumab in switchers and biologic-naïve patients.

**Method:** This study included adult patients from the Dutch severe asthma registry (RAPSODI) who initiated dupilumab. Changes in fatigue (Checklist Individual Strength – subjective fatigue, CIS-F[5]), and asthma control (Asthma Control Questionnaire, ACQ6) over 12 months (at 3-month intervals) were analyzed using linear mixed models with a random intercept. Biologic-naïve was defined as having no previous biologic or switched with washout > 3 months before starting dupilumab. Mean effect 'on dupilumab' (95%CI) was defined as baseline versus all measurements 'on dupilumab' (3-12 months) taken together.

**Results:** Patients (N=236; 52% female; 45% biologic-naive) had a mean CIS-F score of 38 (SD 12) at baseline, with 63% having severe fatigue (≥36). As compared to baseline, both fatigue and asthma control improved within the first 3 months and then remained stable (Figure 1). Mean decrease on dupilumab was -3.3 (95%CI -4.6 ; -1.9) for

fatigue and -0.45 (-0.57 ; -0.34) for asthma control. Biologic-naïve patients had higher baseline fatigue scores, and larger decreases in fatigue on dupilumab (mean -4.7 (-7.0 ; -2.5)) as compared to switchers (mean -2.5 (-4.13 ; -0.94)). A similar pattern was shown for asthma control, with a -0.85 (-1.04 ; -0.66) decrease in naïve patients, and a -0.24 mean decrease (-0.84 to -0.37) in switchers. After 12 months, 50% of patients still had severe fatigue. The minimal clinically important difference (MCID: -10 established for chronic obstructive pulmonary disease) for fatigue was observed for 23% of patients, and for 46% of patients in asthma control (MCID: -0.5).

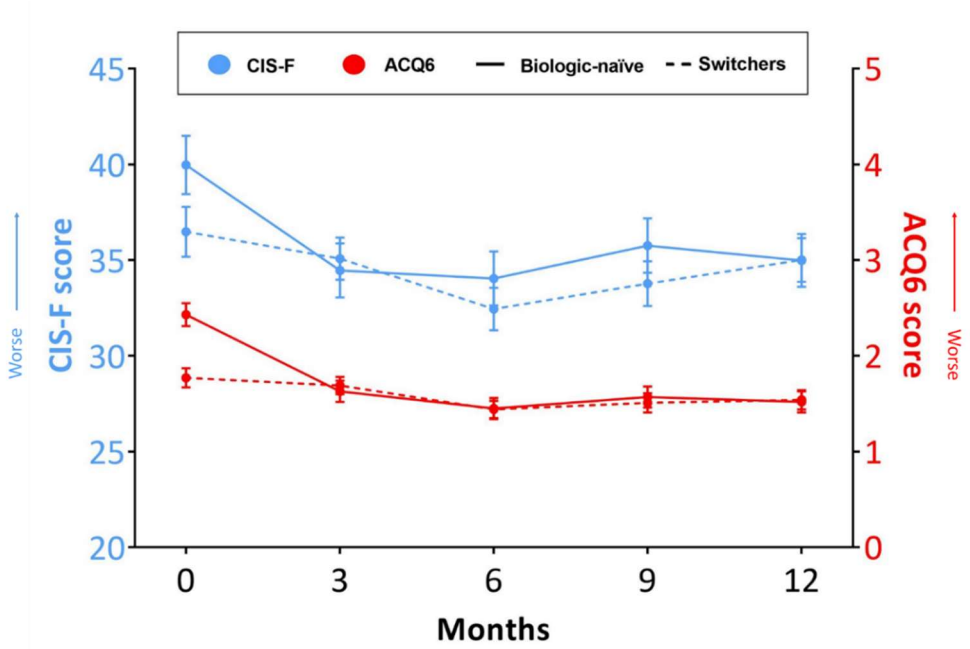


**Figure 1.** Mean (95% CI) for fatigue (CIS-F) and asthma control (ACQ6) during 12 months on dupilumab. Biologic-naïve: patients who had no previous biologic or switched with washout > 3 months before starting dupilumab.

**Conclusion:** We found a high prevalence of severe fatigue in patients with severe asthma indicating the importance of addressing this symptom in clinical practice. Dupilumab treatment is associated with reduced fatigue, with largest effects in biologic-naïve patients. However, clinical relevance remains uncertain. Since 50% of patients still had severe fatigue despite biologic treatment, additional interventions should be considered to address this burdensome feature. It is important to assess mechanisms underlying fatigue in these patients. Insight in the minimal clinically important difference for fatigue questionnaires in this population is currently lacking and should be explored in future research.

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# 3

## Realtime kwantificatie van Laser Speckle Contrast Imaging tijdens laparoscopische darmchirurgie: Succesvolle demonstratie in preklinisch model voor darmischemie

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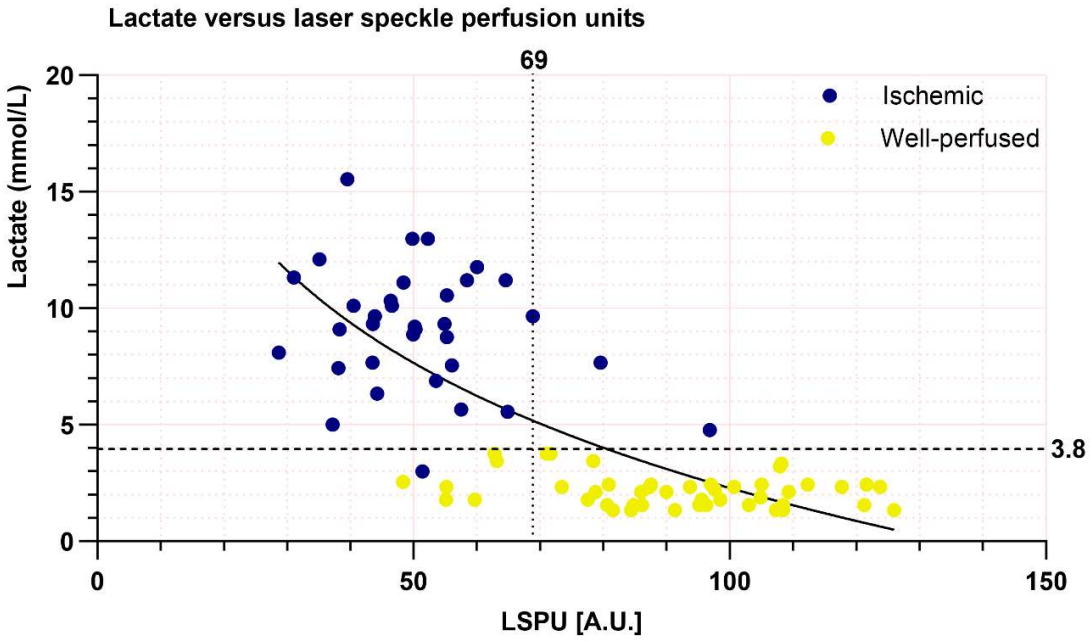
**Achtergrond:** Naadlekkage is een van de meest gevreesde complicaties na colorectale chirurgie. Het heeft niet alleen een aanzienlijke impact op de prognose voor de patiënt[1,2], maar leidt ook tot een verhoogde zorgvraag en economische last[3]. Darmperfusie is een belangrijke beïnvloedbare factor voor genezing van de anastomose en dus cruciaal voor het verminderen van naadlekkage[4,5]. Het peroperatief verkrijgen van kwantitatieve informatie over de perfusiestatus is daarmee van essentieel belang.

**Doelen:** Deze studie had als doel om een afkappunt voor Laser Speckle Perfusion Units (LSPU's) vast te stellen om ischemisch en goed geperfundeerd weefsel van elkaar te onderscheiden. Daarnaast werd de inter-observer betrouwbaarheid beoordeeld.

**Methode:** Laparoscopische Laser Speckle Contrast Imaging (LSCI) werd uitgevoerd met het PerfusiX-Imaging®-systeem. In deze studie werd een varkensmodel gebruikt waarin ischemische dunne darm lussen werden gecreëerd. De opererende chirurg selecteerde in elke darmlus, op basis van peroperatief getoonde LSCI-kleurenkaart, drie gebieden: een ischemisch gebied, een goed geperfundeerd gebied en de overgangszones (watershed areas). Daarna werden de lokale capillaire lactaatniveaus (LCL) gemeten. Door middel van *logaritmic curve estimation* werd de correlatie tussen de LSPU- en LCL-niveaus berekend. Vervolgens werd een afkappunt voor LSPUs vastgesteld. De inter-observer variabiliteit werd geanalyseerd met de opererende chirurg, vijf LSCI-experts en vijf artsen zonder ervaring met LSCI.

**Resultaten:** Direct na de ligatie van de mesenteriale arteriën waren de verschillen in LSPU-waarden tussen ischemisch en goed geperfundeerd weefsel significant ($p < 0,001$). Deze verschillen namen toe bij alle daaropvolgende metingen. Ook de LCL-niveaus verschilden significant na zowel 60 als 120 minuten ($p < 0,001$). De *logaritmic curve estimation* toonde een $R^2$-waarde van 0,56 tussen LSPU- en LCL-waarden (zie figuur 1). Een LSPU-afkappunt werd vastgesteld op 69, met een sensitiviteit van 0,94 en een specificiteit van 0,87. Voor LCL werd een afkappunt van 3,8 mmol/L vastgesteld, met een sensitiviteit van 0,97 en een specificiteit van 1,0. Er was geen verschil in de beoordeling tussen ervaren en onervaren waarnemers. De Cohen's Kappa-waarden waren matig tot goed (0,52-0,66).




**Figuur 1.** Scatterplot van de Regions of Interest (ROI) van ischemische (blauw) en goed geperfundeerde (geel) gebieden.

Hogere Laser Speckle Perfusion Units (LSPUs) duiden op een betere perfusie. De horizontale zwarte stippellijn vertegenwoordigt de afkapwaarde voor lactaatniveaus (3,8 mmol/L), terwijl de verticale gestippelde lijn de afkapwaarde voor LSPU's (69 AU) aangeeft. De $R^2$-waarde werd berekend op 0,56 (zwarte doorgetrokken lijn). Duidelijk zichtbaar is het verschil tussen ischemische waarden en goed geperfundeerde waarden, waarbij hogere LSPU's gepaard gaan met lagere lactaatniveaus.

**Conclusie:** Realtime kwantificatie van LSPU's lijkt een bruikbare methode te zijn om tijdens operaties de weefselperfusie te beoordelen. Er kon een afkappunt worden vastgesteld met hoge sensitiviteit en specificiteit. De inter-observer variabiliteit was matig tot goed, ongeacht de eerdere ervaring van de waarnemers met de techniek.

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# 4

## What is the most optimal bearing surface for minimizing instability after revision total hip arthroplasty? A systematic review and meta-analysis comparing (dislocation risk of) dual mobility, large femoral head and constrained bearings.

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**Background:** Dislocation is a major complication after primary and particularly revision total hip arthroplasty (THA) and a frequent cause for re-revision surgery [1,2]. Debate continues on choosing the most optimal bearing surface to prevent dislocation after revision total hip arthroplasty: Dual Mobility Cups (DMC), Large femoral heads (LFH) or Constrained liners (CL) [1-5]. The aim of this review is to determine the most optimal bearing surface for minimizing instability after revision THA surgery.

**Aim:** This systematic review addresses the dislocation rate and survivorship of various operative treatment strategies to reduce the risk for dislocation after revision hip arthroplasty. We aimed to provide an overview of current evidence regarding the use of dual mobility cups, large femoral head components and constrained cups in revision THA and highlight gaps in which further research is needed.

**Methods:** For this systematic review and meta-analysis we searched the following databases: Embase, Pubmed, Cochrane, Google Scolar, and Web of Science. Primary outcome measures were dislocation rate, re-revision for dislocation. Secondary outcome measures were complications, functional outcomes/PROMs, and re-revision for any reason. Inclusion criteria were: patients > 18 years with revision total hip

replacement with a dual mobility, large femoral head (36 mm or larger) bearing, or constrained cup; recent publication (<10 years); RCT/retrospective cohort studies. All titles and abstracts, and subsequently full texts were screened by three independent reviewers (MCV, RMP, ME) and assessed on methodological quality. Any disagreements were discussed in a consensus meeting.

**Results:** The search resulted in 1,510 records, 55 of which were assessed for eligibility based on full text. 14 reports were included in the review, overall they were of moderate methodological quality. Mean follow-up varied from 14 months to 5 years, mean age ranged from 61 to 86 years. DMC had a significantly lower risk of dislocation compared to LFH and CL, with odds ratios (OR) of 0.34 [95% CI 0.20-0.60] and 0.36 [95% CI 0.21-0.62] respectively (p=<.001). There was no difference in dislocation rate between LFH and CL (p=.56) (Figure 1). DMC was associated with a higher risk of re-revision due to dislocation compared to LFH (OR 1.35 [95% CI 1.13-1.61], p<.001). There was, however, some heterogeneity in these results ($I^2$=>50%). CL showed no increased risk of re-revision due to dislocation, compared with DMC and LFH.

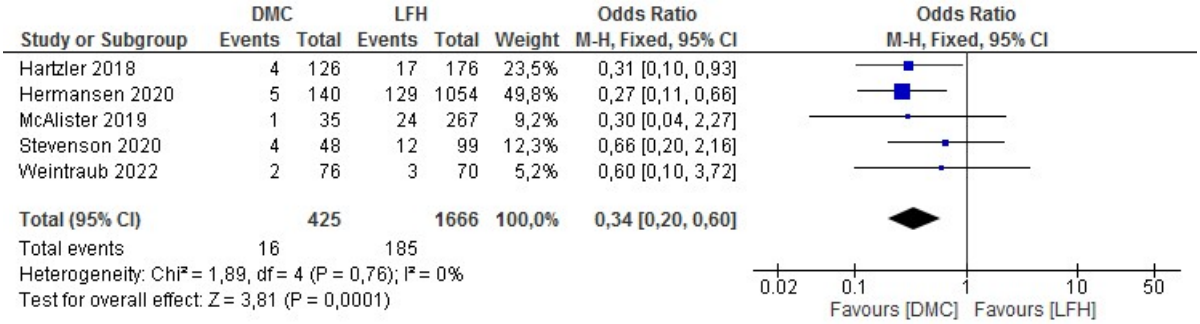


**Figure 1.** Risk of dislocation: DMC vs LFH

**Conclusion:** Based on these results, DMC appears to be the most optimal bearing surface to prevent instability in revision THA. However, due to the low number of studies and moderate methodological quality, conclusions have to be drawn with care. Hoskins et al (2023) (5) published a similar systematic review discussing the difference in dislocation risk between DMC and LFH in primary and revision total hip arthroplasty. Hoskins reported evidence for the potential clinical benefit of DMC over LFH, which was also presented in our results. Our review focused specifically on revision THA, comparing DMC, LFH as well as constrained liners. We are currently planning an international collaboration of registry studies to further analyze this research question.

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# 5

## Evaluating Post-COVID Care: A Retrospective Cohort Study into Long-Term Symptoms

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**Background**: Post-COVID refers to persistent symptoms lasting at least 3 months after a COVID-19 infection. Currently, 1 in 8 people experience long-term symptoms.[1] In the Northern Netherlands, a multidisciplinary care pathway has been developed for this patient group to ensure optimal treatment and rehabilitation.

**Aim**: To evaluate the post-COVID care pathway in the Northern Netherlands by measuring changes in persistent symptoms.

**Method**: For this retrospective cohort study, data were collected from patients who visited the post-COVID outpatient clinic between August 2020 and August 2023. Patient characteristics, symptoms and healthcare utilisation were collected from the patients' medical records at baseline and the first follow-up visit. Changes over time were assessed using the Wilcoxon-rank test and McNemar test. Binary logistic regression was used to assess the association between symptoms and healthcare utilization.

**Results**: A total of 808 patients visited the outpatient clinic at a mean±SD of 33.5±29.2 weeks after their first COVID-19 infection. Of these, 603 patients (31% male, age 47.2±13.8 years, BMI 27.3±5.5 kg/m$^2$, $FEV_1$ 97.0±14.8 %pred) had a follow-up visit after a mean of 12.7±8.7 weeks. At baseline, these 603 patients reported a median [IQR] number of 4 [3-5] symptoms, which decreased to 2 [1-3] symptoms at follow-up ($p<0.01$). Those receiving more complex care, initially had more symptoms and continued to have a higher number of symptoms at follow-up.

The majority of patients reported pulmonary symptoms at baseline (84% at baseline vs. 56% at follow-up), followed by fatigue-related symptoms (80% vs 58%), constitutional symptoms (60% vs 36%) and neurocognitive symptoms (54% vs 33%), all of which improved over time ($p<0.01$). Interestingly, 30 patients (5.0%) reported being symptom-free at follow-up.

Regarding healthcare utilization, 271 patients (45%) had received treatment in primary care - mainly physiotherapy (92%) and occupational therapy (30%) - 77 (13%) in secondary care - mainly outpatient rehabilitation (77%) - and 61 (10%) in both primary and secondary care. A total of 151 (25%) patients had not consulted any other health professional between baseline and follow-up, while data were not available for the remaining 43 patients (7%).

After adjustment for sex, age, BMI and comorbidities, patients with neurocognitive symptoms were more likely to be seen in secondary care, either combined with primary care (OR 3.03; 95% CI: 1.70-5.42) or not (OR 4.06; 95% CI: 2.10-7.88). Patients with fatigue-related symptoms were most likely to be seen by a healthcare professional in primary care (OR 1.79; 95% CI: 1.11-2.89) or secondary care (OR 2.32; 95% CI: 1.11-4.82), while patients reporting constitutional symptoms were more likely to be seen in primary care, either in combination with secondary care (OR 1.98; 95% CI: 1.06-3.69) or not (OR 1.72; 95% CI: 1.14-2.58). Of note, patients with pulmonary symptoms were less likely to be referred to other health professionals (Figure 1).

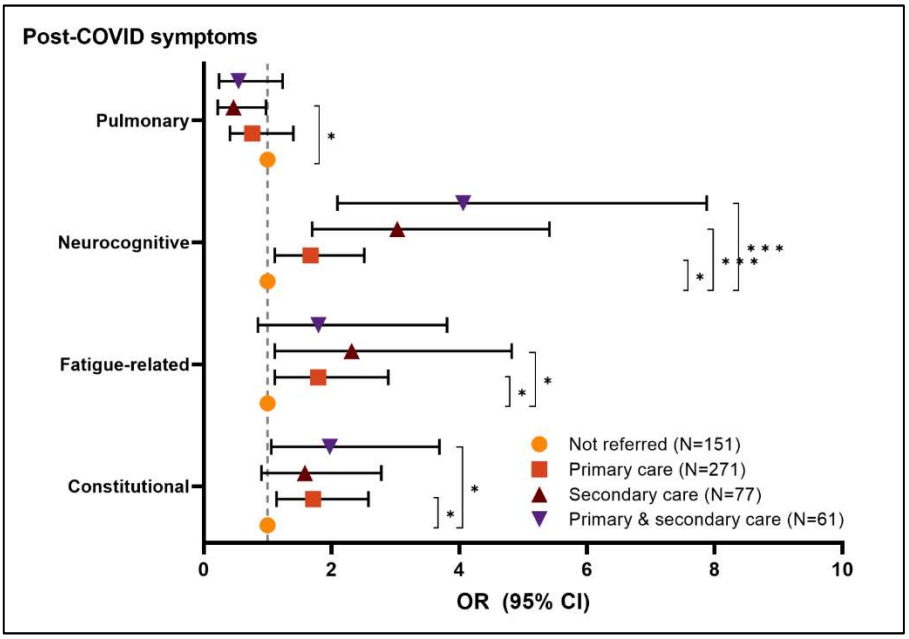


**Figure 1.** Association between post-COVID symptoms at baseline and healthcare utilisation in patients with persistent symptoms after COVID-19 infection.
Binary logistic regression, adjusted for sex, age, BMI and comorbidities. Results are expressed as OR with 95% CI compared with the reference group ('not referred').

**Conclusion**: These results show that the established care approach seems effective in improving persistent symptoms, with different treatment strategies depending on the symptoms. Further research is needed to assess the durability of these results and to explore the characteristics of people who may not experience immediate improvement.

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# 6

## Kiezen voor Beter, een onderzoek naar versterken van de invloed van verpleegkundigen op goede ziekenhuiszorg in een STZ-ziekenhuis (Medisch Centrum Leeuwarden)

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**Achtergrond:** Verpleegkundigen zijn onmisbaar bij goede ziekenhuiszorg. Wanneer verpleegkundigen niet toekomen aan noodzakelijke zorg leidt dat tot negatieve patiënten-uitkomsten (Gustafsson et al., 2020). Vakinhoudelijk leiderschap ondersteunt prioritering van noodzakelijke zorg , maar verpleegkundigen hebben moeite dit in concrete zorgsituaties vorm te geven (Rodríguez-García et al., 2020). Kiezen voor Beter ondersteunt toepassing van leiderschap in noodzakelijke zorg en beoogt tot een duurzame praktijkverandering te komen. Het project werd uitgevoerd met 3 deelstudies op verpleegafdelingen B, T en U van september 2020 tot en met juni 2023.

**Doelstelling:** Successen en ontwikkelkansen beschrijven ter prioritering van noodzakelijke zorg door het tonen van leiderschap bij palliatieve zorg en zelfregie bij voeding en mobiliteit.

**Methode:** Actieonderzoek waarbij voor de deelstudies zelfregie 30 patiënten-interviews, 20 participerende observaties en 6 focusgroepen met verpleegkundigen werden afgenomen en voor de deelstudie palliatieve zorg 2 focusgroepen met verpleegkundigen en arts assistenten, 10 participerende observaties en 6 interviews met verpleegkundigen. De kwalitatieve data werd thematisch geanalyseerd in Atlas-ti.

**Resultaten:** Zelfregie: verpleegkundigen en patiënten hebben vaker aandacht voor zelfregie rondom voeding en mobiliteit, zoals aansluiten op wensen en behoeften. Patiënten hechten veel waarde aan de rol van de verpleegkundige. Toch vinden zij dat ze onvoldoende worden gestimuleerd bij zelfregie en geven aan dat o.a. het vroegtijdig betrekken van mantelzorgers en anticiperen op de thuissituatie nodig is. Verpleegkundigen erkennen het belang van zelfregie maar blijken zowel onbewust bekwaam als onbekwaam in de ondersteuning. Verpleegkundigen focussen vooral op het ‘hier en nu’. Casusbesprekingen aan de hand van het 5A model kan bewustwording te vergroten.

Palliatieve zorg: verpleegkundigen en arts-assistenten associëren deze zorg vooral met de stervens- en nazorgfase, waarbij comfort en zorg voor naasten als teamverantwoordelijkheid wordt gezien. Verpleegkundigen tonen moed in het opkomen voor patiënten door het achterhalen van hun wensen en de vertaling daarvan naar artsen of naasten. Er is echter kennistekort over de symptoomgerichte fase van palliatieve zorg en onduidelijkheid over proactieve zorgplanning als verpleegkundige verantwoordelijkheid. Dit kan leiden tot morele dilemma's bij verpleegkundigen wanneer wensen van patiënten niet worden gerealiseerd.

**Conclusie:** Verpleegkundigen tonen vakinhoudelijk leiderschap door erkenning van het belang van zelfregie en palliatieve zorg maar hebben behoefte aan inhoudelijke kennis om hun leiderschapscompetenties te versterken.

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# 7

## Accuracy of a new automatic sensor system (ADEPTH®) for measuring drill hole depth in orthopedic surgery

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**Background:** In the field of orthopedic trauma surgery, bone screws are commonly used for the surgical treatment of bone fractures. For an adequate fixation of the fractured bone fragments, it is crucial that screws of the correct size are selected, as both long screws, as well as short screws may cause complications (1-2). Still, incorrect screw selection is very common, with 9% of all bone screws being estimated to be wasted, making bone screws the most commonly wasted implant in orthopedic trauma surgery (3). Currently, the measurement of drill hole depths, and hence the choice for the screw size is performed with a manual depth gauge (DG). Previous literature, however, has shown that the DG has a low accuracy, possibly contributing to the high waste of bone screws (4-5). Therefore, exploring the options for novel, more accurate technology to measure drill hole depths is important.

**Aim:** The aim of this study was to compare the accuracy, precision and the rate of correct screw size selection of a novel, prototype automatic sensor (ADEPTH®) (Fig. 1) to that of a DG when measuring drill hole depths on human cadaveric bones.

**Methods:** Holes were drilled in the femur, tibia and bilateral radii of a Thiel embalmed human cadaver. The depth of all holes was measured with both the ADEPTH® as well as a conventional DG. Following this, a high resolution computed tomography (CT) scan was performed and the drill hole depths were measured to serve as a true reference for the ADEPTH® and the DG measurements. Errors and variances of the errors of the ADEPTH® and DG measurements, compared to the CT measurements, were analyzed to assess the accuracy and precision, respectively. Additionally, the proportion of correct screw size selection of both the DG and ADEPTH® system were established based on the CT measurements.

**Results:** A total of 129 holes were drilled by five orthopedic surgery residents and one orthopedic surgeon. The ADEPTH® showed a smaller mean absolute error (0.72 mm [0.62, 0.83]) compared to the DG measurements (0.88 mm [0.75, 1.02]), yet the difference was not statistically significant (p = 0.098). The ADEPTH® showed a smaller variance (i.e. higher precision) compared to the DG measurements, and the ADEPTH®

measurements showed a significantly higher agreement with the CT (68%) as compared to the DG measurements (52%) (p = 0.03), indicating a higher rate of accurately measured screw sizes.

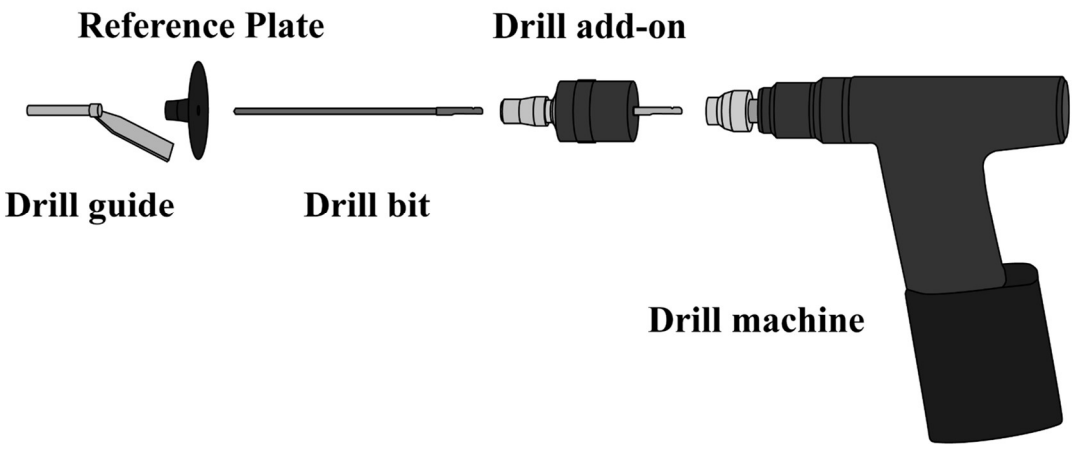


**Figure 1.** Schematic of the components of the ADEPTH® system.

**Conclusions:** The ADEPTH® showed a similar accuracy to the depth gauge, but a higher precision and a higher agreement with the CT, indicating superiority in screw size selection. A feasibility study in a clinical setting is the next step to evaluate the possible benefit of the ADEPTH® system during orthopedic trauma surgery.

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# 8

## Association Between Oxygen Supply in Acute COVID-19 Infection and Long-COVID Syndrome

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**Background**: Long-COVID syndrome is a consequence of COVID-19 infection. After hospitalization, 15% of patients report persistent symptoms. To better understand this phenomenon, possible predictors should be identified.

**Aim**: To assess the association of oxygen supply in acute COVID-19 infection with lung function impairment and long-term sequelae.

**Methods**: Real-world data from patients admitted to a tertiary hospital with acute COVID-19, were collected from March 2020 to December 2022. Lung function, including diffusion capacity (TLCO), and persistent symptoms were assessed at 3, 6 and 12 months. Linear regression analyses and Chi-square tests were used to examine the association between supplied oxygen (l/min), duration and outcomes, adjusted for sex, BMI and age.

**Results**: 450 patients were included (58% male, mean±SD age 64±14y, BMI 29±5 kg/m$^2$), of whom 316 patients (70 %) required oxygen therapy. 98 patients (45 %) were additionally treated with high-flow oxygen (HFNC). After adjustment for confounders, the TLCO at 3 months was lower in patients with HFNC compared to those without (mean±SEM 59.7± 3.7 %$_{pred}$ vs 81.4±1.9 %$_{pred}$, p<0.001, n=42), but not at 6 and 12 months. In addition, longer duration of oxygen supply was associated with a lower TLCO at 3 months (β: -0.46 %/day, 95% CI: -0.67; -0.26), but this diminished at 6 months (β: -0.20%/day, 95% CI: -0.54; 0.15), and 12 months (β: 0,005 %/day, 95% CI: -0.63; 0.64). No differences in patient-reported symptoms were observed at any time point.

**Conclusion**: Higher and longer oxygen supply during the acute phase of COVID-19 results in lower diffusion capacity at 3 months. However, a spontaneous recovery of this phenomenon is seen at 6 months.

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# 9

## The effect of the implementation of a clinical decision support (CDS) tool on the percentage of adequately prescribed LMWH-thromboprophylaxis: an interrupted time series

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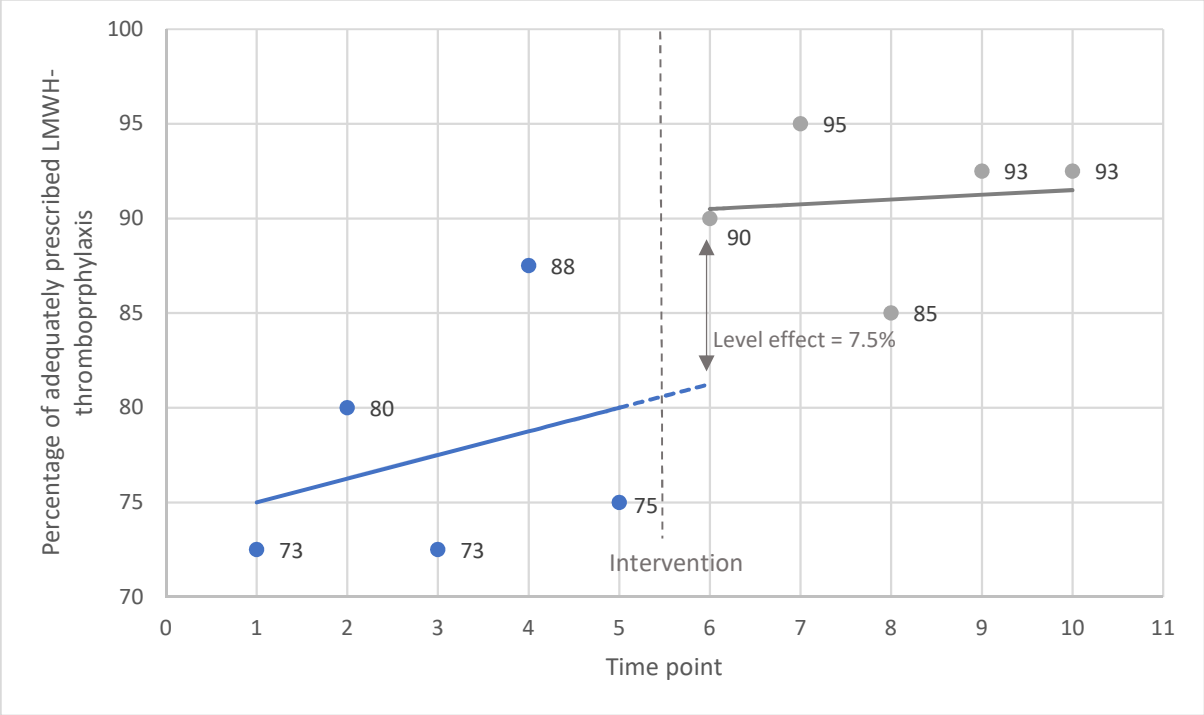
**Background:** Nonsurgical patients have an increased risk of developing a venous thromboembolism (VTE) during hospital admission. This risk can be reduced by thromboprophylaxis with low molecular weight heparins (LMWHs) [1]. In thromboprophylaxis guidelines the Padua Prediction Score (PPS) has been suggested as the best available model to assess the risk of VTE in these patients, but adherence to these guidelines is known to be low.

**Aim:** Objective of this study was to increase the percentage of adequately prescribed thromboprophylaxis with a LMWH in patients with a high VTE risk by implementation of an intervention consisting of a clinical decision support (CDS) tool in the electronic health record. Secondary specificity and sensitivity of the CDS tool were determined.

**Methods:** Data on the PPS and thromboprophylaxis in non-surgical patients (≥ 18 years) were prospectively collected for a total of ten time points before and after the implementation of the intervention. Patients who recently (<1 week) underwent a percutaneous coronary intervention, and palliative patients were excluded. A time series analysis was performed using an autoregressive integrated moving average (ARIMA) model to examine the effect of the intervention on the percentage of adequately prescribed LMWH-thromboprophylaxis.

**Results:** 400 patients were included, 200 patients pre- and 200 patients postintervention. Assuming a direct effect of the intervention on the percentage of adequately prescribed LMWH-thromboprophylaxis a level effect of 7,5% was calculated, this level effect was not significant ([CI] -4,4-19,5; P=0,19) as can be seen in figure 1. The CDS tool had a sensitivity of 92% and a specificity of 68%.




| | Effect estimate [95% CI] | SE | P-value |
|---|---|---|---|
| Slope pre-intervention | 1.4 [-1.8-4.6] | 0.999 | 0.22 |
| Slope post-intervention | 0.4 [-2.7-3.6] | 0.994 | 0.67 |
| Level effect | 7.5 [-4.4-19.5] | 4.201 | 0.19 |

**Figure 1.** Adequately prescribed thromboprophylaxis pre- and post-intervention.

**Conclusions:** The implementation of a CDS tool had no significant effect on the percentage of patients adequately treated with thromboprophylaxis in an interrupted time series analysis. The CDS tool was able to successfully identify patients with a high risk of developing a VTE.

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# 10

## Lower risk of acute kidney injury with use of SGTL2i in hospitalised patients: A retrospective propensity-matched cohort study

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**Background:** Globally, acute kidney injury (AKI) impacts 1 in 5 adults during hospitalisation, with an in-hospital mortality rate of almost 25%, a rate that increases with the severity of AKI[1]. Recent studies have shown AKI-protective properties of sodium-glucose co-transporter-2 inhibitors (SGLT-2i). SGLT-2i improve renal and cardiovascular outcomes in patients with chronic kidney disease (CKD), heart failure, or type 2 diabetes mellitus (T2DM)[2]. Meta-analyses performed in patients with T2DM receiving SGLT-2i showed that the likelihood of developing AKI is diminished by 23-36%[2,3]. However, there is still uncertainty about whether to discontinue, continue, or initiate SGLT-2i in hospitalised patients.

**Aim:** To assess the association between pre-admission use of SGLT-2i and AKI risk in real-world hospitalised patients.

**Methods:** This single-centre retrospective cohort study used data from patients hospitalised between 01-11-2021 and 13-02-2024 in the Medical Centre Leeuwarden. Inclusion criteria were either a history of heart failure, T2DM, CKD, macroalbuminuria, or a combination. Exclusion criteria were patients on dialysis therapy before hospital admission, patients with incomplete data related to kidney function, and incomplete data for SGLT-2i indication We assessed the occurrence of AKI, according to the KDIGO definition, in selected SGLT-2i-users and 1:1 matched non-users. The association between SGLT-2i use and AKI was determined with mixed binary logistic regression considering the clustering of observations within patients and matched pairs.

**Results:** A total of 1042 hospital admissions (521 SGLT-2i users and 521 non-users) were included. Of these, 34% of patients were women, the median age was 74 years (IQR 66-79). 19% had heart failure, 10% had chronic kidney disease, 5% had T2DM, and 66% had a combination of the before-mentioned SGLT-2i indications. Successful matching achieved balance between both groups (aim for all SMD <0.1). The percentage of hospital-acquired AKIs was 19% among the SGLT-2i users and 27% among the non-

users (odds ratio = 0.61 (95%CI = 0.46 to 0.82)). The mortality among the SGLT-2i users is 4% and in the control group 6%. Patients with AKI had a longer median hospital stay of 8 days while patients without AKI had a median stay of 3 days.

**Conclusion:** We found a significantly lower risk of hospital-acquired AKI in patients with pre-admission use of SGLT-2i. Our findings suggest that SGLT-2i might also be protective for AKI in hospitalised patients. Future interventional trials are needed to confirm this and investigate whether SGLT-2i continuation or initiation during hospitalisation decreases the risk of AKI.

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# 1 Posters

## A new procedure-based assessment of operative skills in gastric bypass surgery, evaluated by video fragment rating.

Mirjam A. Kaijser[1,2], Gabrielle H. van Ramshorst[3], Bart A. van Wagensveld[4], Nic J. G. M. Veeger[5], Jean-Pierre E. N. Pierie[1] & Expert panel of Dutch and Belgian Bariatric Surgeons

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**Introduction:** Feedback on technical and procedural skills is essential during the training process of residents and fellows. The aim of this study was to assess the performance of a newly created instrument for the assessment of operative skills using laparoscopic Roux-en-Y gastric bypass (LRYGB) video fragments.

**Methods:** A new procedure-based assessment (PBA) was created by combining LRYGB key steps with a 5-point independence scale. LRYGB performed by residents and surgeons with different levels of expertise were video recorded. Fragments of the pouch creation, gastro-jejunostomy and jejunojejunostomy, were review by 12 expert bariatric surgeons and the operative skills assessed with the PBA, *Objective Structured Assessment of Technical Skill* (OSATS), and the Bariatric OSATS (BOSATS). The PBA was compared to the OSATS and BOSATS. Mean scores for all items of the different assessments were summarized and compared using a T-test.

**Results:** The scores of the procedural steps were combined and compared for all levels. The mean scores for beginner, intermediate and expert level were respectively 2.71, 3.70 and 3.90 for the PBA, for the OSATS 1.84, 2.86 and 3.44, and for the BOSATS 2.78, 3.56, 4.19. Each of these assessments differentiated between the three skill levels (all $p<0.05$).

**Conclusion:** The PBA discriminates well between different levels of operative skills. Similar patterns were found for the validated OSATS and BOSATS, showing that the randomly selected video fragments are representative samples for assessing skill level. Future research will demonstrate whether these results can be extrapolated to clinical training, and which scores allow for procedure certification.

# 2

## Location and volume of screen-detected lung nodules: post hoc analysis from the UK Lung Cancer Screening (UKLS) Trial

Oke Dimas Asmara[1,2,3], Harriet Lancaster[4,5,6], John K. Field[7], Michael P.A. Davies[7], Stephen W. Duffy[8], E. Christiaan Boerma[3], Edith Visser[9], Marjolein A. Heuvelmans[4,5,6], Anand Devaraj[*10,11], Wouter H. van Geffen[*2], Matthijs Oudkerk[*12]

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* shared last author

**Background:** UKLS trial showed that a single round of LDCT screening can reduce lung cancer deaths. However, nodule distribution regarding location and size remains a topic of interest, especially for the choice of workup of suspicious nodules.

**Aim:** To analyze the location of nodules with a volume ≥100mm$^3$ in the UKLS trial, and to provide insights into their role in distinguishing between malignant and benign lesion in early lung cancer detection.

**Methods:** 416 Participants with 616 baseline lung nodules ≥100mm$^3$ were included. Nodule location was categorized by lobe and by attachment: intraparenchymal, juxta pleural or pleural-based. Nodules were classified based on semi-automated volume: 100mm$^3$–300 mm$^3$ and >300mm$^3$. Nodules were classified as non-benign or benign

based on radiologist interpretation. Chi-Square tests were used to demonstrate the association between nodule location and volume with radiologist interpretation.

**Results:** Among 616 lung nodules, 160 (26%) were located in left lower lobe, 95 (15%) in left upper lobe (LUL), 158 (25.6%) in right lower lobe, and 128 (20.8%) in right upper lobe (RUL). Radiologists classified 401 nodules (65.1%) as non-benign and 215 (34.9%) as benign. Features predicting non-benign classification included intraparenchymal location (264/271 nodules , 97.4%, $p<0.001$), location in the LUL (74/95 nodules, 77.9%) and RUL (101/128 nodules, 78.9%, both $p<0.001$), and volume $\geq 300mm^3$ (150/206 nodules, 72.8%, $p=0.004$).

**Conclusions:** Nodules located intraparenchymally, in upper lobes and with volume $\geq 300mm^3$ are significantly associated with non-benign radiological classification.

# 3

## Innovaties in Schisis behandeling: het Palatumplaatje

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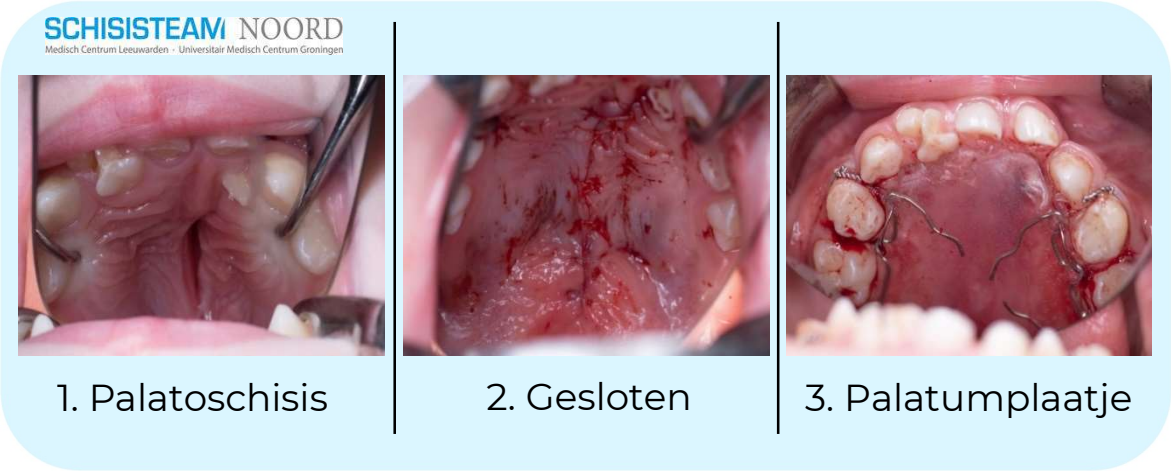
**Achtergrond en doel:** In Nederland worden 17 op de 10.000 kinderen geboren met een schisis.[1] Van deze kinderen hebben 33% een geïsoleerde palatoschisis en 39% een cheilognatopalatoschisis.[2] Chirurgische reconstructie van het palatum is cruciaal om normale voeding, spraak en gehoor te faciliteren. Het percentage oronasale fistels, wereldwijd beschreven, na primaire palatumsluiting kan oplopen tot 36%.[3] Na secundaire fisteloperaties kan dit zelfs oplopen tot 65%.[3] In 2014 is in het MCL als eerste wereldwijd een 3D custom-made geprint polymethylmethacrylaat (PMMA) plaatje geïmplementeerd als bescherming na een palatumsluiting. Ons doel is om onze ervaring met een palatumplaatje te evalueren, in de context van (complexe) gehemeltespleet herstel.

**Methode:** Voor dit retrospectieve dossieronderzoek is data verzameld van alle kinderen die geselecteerd werden voor het plaatsen van een palatumplaatje ten tijde van de (primair) palatumsluiting. Selectie criteria waren schisis type en aanwezigheid van primaire of secundaire kiezen voor fixatie van het plaatje. Het palatumplaatje werd preoperatief ontworpen doormiddel van individuele 3D-scans van het gehemelte. Direct na palatumsluiting werd het plaatje geplaatst met een interface van siliconen ter afsluiting en gefixeerd met 0,4mm ijzerdraad. Postoperatief waren er geen dieetrestricties. Na 2-3 week werd het PMMA plaatje verwijderd, gevolgd door reguliere controles van het schisisteam volgens ons lokale protocol.

**Resultaten:** In totaal werden 69 patiënten (65% jongens), behandeld met een palatumplaatje. Hiervan had 84% een cheilognatopalatoschisis (41% unilateraal, 59% bilateraal) en de overige 16% had een geïsoleerde palatoschisis. De indicatie voor het plaatje was bij 28 patiënten primair palatumsluiting en bij 41 fistel herstel. De mediane (IQR) leeftijd bij plaatsing was 65 (41-117) maanden, en het plaatje bleef 21 (14-23) dagen in situ. De gemiddelde ziekenhuisopname was korter dan 24 uur. Alleen 1 patiënt verbleef 4 nachten opgenomen na het palatumsluiting vanwege een pre-existente probleem. Van de 9 (13%) patiënten waarbij het gehemelte niet volledig gesloten was na verwijdering van het plaatje, waren 7 (9%) met het palatumplaatje behandeld voor een reeds bestaande palatum fistel. 4 van de 7 (57%) presenteerden zich met een bilateraal complexe cheilognatopalatoschisis.




**Disclaimer:** foto's gemaakt en gedeeld nadat toestemming werd verkregen

**Conclusie:** Het gebruik van een palatumplaatje blijkt een haalbare en veelbelovende aanvulling te zijn op de chirurgische behandeling van palatoschisis. Het lijkt tevens een betrouwbare aanvulling op de standaard chirurgische zorg, gezien er geen complicaties heeft plaatsgevonden als gevolg van het palatumplaatje. Ondanks enkele technische uitdagingen, is er in de afgelopen tien jaar aanzienlijke vooruitgang geboekt in de verdere ontwikkeling. Met name het 3D-scannen van het gehemelte bleek zeer efficiënt en wenselijk voor jonge patiënten. De korte ziekenhuisopname en directe terugkeer naar een normaal dieet dragen positief bij aan de patiënttevredenheid. Concluderend, de toepassing van een op-maat-gemaakt beschermend palatumplaatje is veilig met zeer positieve operatieve resultaten naast tevreden kind en ouders.

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# 4

## Diagnostic accuracy of point-of-care ultrasound in detecting clavicle fractures in a mixed cohort

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**Background:** Clavicle fractures are amongst the most prevalent presentations in the Emergency Department (ED) in patients from all ages. Current standard of care is to diagnose clavicle fractures with X-ray. However, X-ray examination generally requires the patient to attend to a hospital. Especially when travel distances are long or when resources are scarce, physicians have to decide if they want to admit the patient for further diagnostic workup based on findings at physical examination. In these instances, Point-of-Care UltraSound (PoCUS) may serve as a non-invasive and radiation free imaging adjunct to help decide which patients need a further workup of their clavicle injuries.

**Aim:** This study aimed to investigate the diagnostic accuracy of PoCUS of the clavicle performed by non-radiologists in the workup of a heterogenous population of patients presenting with clavicle injuries.

**Methods:** A multicentre, prospective cohort study was conducted in 9 emergency departments (ED's) to establish the diagnostic accuracy of PoCUS of the clavicle in a mixed cohort of patients ≥4 years of age who presented with a clavicle injury. PoCUS was performed by trained emergency physicians, and results were compared with X-ray outcomes (gold standard).

**Results:** A total of 167 patients were included, of which 127 (76%) patients had a fracture on X-ray, and 121 (72%) on PoCUS. PoCUS of the clavicle had a sensitivity of 93% (95%CI 87-97%), a specificity of 93% (95%CI 80-98%), a negative likelihood ratio of 0.09 (95%CI 0.04-0.14), and a positive likelihood ratio of 12.39 (95%CI 4.17-36.82) for the

presence of a clavicle fracture. Stratified based on age, specificity of PoCUS was lower in children compared to adults, whereas sensitivity was not affected. The agreement between X-ray and PoCUS for fracture dislocation was substantial (κ=0.771).

**Conclusions:** PoCUS of the clavicle is a useful adjunct in the triage of patients with clavicle injuries and can help to distinguish which patients need further diagnostic workup.

# 5

## The effect of bearing type on survival after primary total ankle arthroplasty (TAA) in the Netherlands: register based evaluation of current practice.

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This study was performed in Medical Center Leeuwarden as part of the PhD-thesis of M.C Vink, in collaboration with the MCL Academy.

**Background:** Total ankle arthroplasty (TAA) has been developed as an alternative for ankle arthrodesis in order to preserve mobility of the ankle joint in patients with disabling tibiotalar osteoarthritis (OA). Over time, development in implant design and surgical techniques have improved results[1,2]. TAAs are divided into mobile- and fixed-bearings (MB and FB). MB-prostheses consist of 3 components: the polyethylene (PE) insert is mobile between the tibial and talar components, resembling the natural movement of the ankle joint [1]. FB prostheses consist of only 2 components: the PE-insert is fixed to the tibial component, providing more stability [3]. However, both types have disadvantages: MB can be complicated by insert dislocations, impingement, and instability, whereas FB shows more loosening and PE-wear [1,3]. Which bearing type is the most optimal choice, is still under debate.

**Aim:** In this study, we aimed to determine the prevalence and trends of FB and MB over time and investigate the effect of bearing type on risk of revision after primary TAA in the Netherlands, using nationwide registry data of the LROI.

**Methods:** All TAAs registered in the Dutch Arthroplasty Register (LROI) between 2014-2023 were included (n=1,246). Bearing type was identified based on implant article number. The trend in use of bearing type over time was described, as well as reasons for revision. TAA (implant) survival was calculated using cumulative incidence of revision. Multivariable cox regression analysis was used to compare FB and MB, adjusting for relevant covariates (e.g. gender, ASA class, BMI, age).

**Results:** Over the last decade, FBs were more often used than MBs (67% vs 33%) . Cumulative incidence of revision at 3, 5 and 7 years was respectively 2.8%, 3.3%, and 5.4% for FB versus 6.5%, 10.4%, and 11.3% for MB. After adjustment for confounders, fixed-bearings showed significantly lower revision rates between 3.5 and 7 years follow-up (hazard ratio (HR) 2.8 (95%CI 1.6-4.9)).

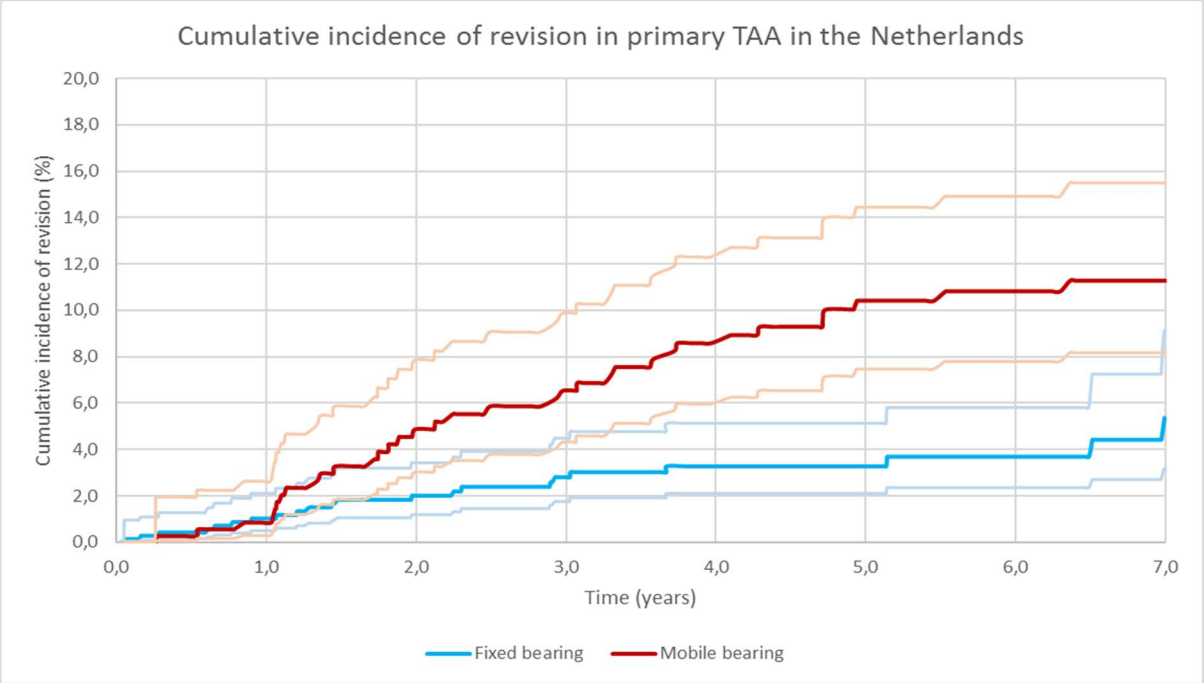


**Figure 2.** Cumulative incidence of revision in primary TAA in the Netherlands (95% CI)

**Conclusions:** Fixed-bearings were associated with a lower risk of revision than mobile-bearings in total ankle arthroplasties based on Dutch registry data. The use of fixed-bearing TAA has increased over time. Existing literature does not report significant differences in survival rate between the two bearing-types [4,5]. This study is limited by a relatively short follow-up time, as registration of TAAs only started in 2014. Also, 11% of bearing types were missing, which led to exclusion of 137 TAAs. Strengths of this study include the use of nationwide registry data: it was the first registry study comparing bearing type in TAA, resulting in the largest cohort so far. Future research could be a similar study using other national arthroplasty registries, for comparison and affirmation. The findings of this study can help surgeons in choosing the right implant for their patients in need of a TAA. Based on our findings, surgeons should opt for a fixed-bearing prosthesis.

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# 6

## High volume centers do not perform better than low volume centers in revision total hip arthroplasty: an exploratory analysis of re-revision risk and mortality based on the LROI.

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**Background:** As the incidence of total hip arthroplasty (THA) rises and the life expectancy of patients improves, there is a growing concern regarding the increasing incidence of revision surgery of failed THA [1, 2]. In the Netherlands, over 3,500 hip revision surgeries are performed annually, and based on current trends it is anticipated this number will continue to increase [3]. Patients receiving THA are getting progressively younger, with an increased likelihood of encountering complications over time [4]. Revision procedures are known to be more technically challenging than primary THA, with higher complication and mortality rates.

With the rising incidence of revision THA (rTHA), there is a growing emphasis on centralization and specialization. Previous studies have shown an association between annual primary THA volume and risk for revision: high volume hospitals perform better than low volume hospitals. However, for rTHA this is largely unknown.

**Aim:** We examined the association between annual THA revision volume and risk for re-revision.

**Methods:** We included all rTHAs between 2007-2023 in general hospitals, registered in the Dutch Arthroplasty Register (LROI). A total of 12,245 rTHAs were included and categorized in low volume (<25 rTHA per year) and high volume (≥25 rTHA per year) hospitals. Competing-risk analyses and Cox proportional hazard regression analyses were performed to assess implant survival, and Kaplan-Meier for mortality. Several subanalyses were performed based on reason for first revision.

**Results:** High volume hospitals showed a significantly higher cumulative risk of re-revision after 1, 3, 5, and 7 years: 11%, 16%, 20%, and 25% compared to 8%, 13%, 16%, and 18% in low volume hospitals. High volume hospitals had an adjusted hazard ratio (HR) of 1.3 (95%CI 1.2-1.4). Subanalyses show that these findings can be largely contributed to major infection revisions (HR 2.1, 95%CI 1.5-2.9), all other reasons for revision showed no significant difference in survival. Patient survival after rTHA is higher in high volume hospitals: 91% versus 82% in low volume hospitals (p<.05).

**Conclusion:** High volume centers do not perform better than low volume hospitals in revision THA. Survival of rTHA after major infection revisions is lower in high volume

hospitals. Based on our results, there is no evidence for minimum case load requirements in rTHA.

Previous studies reported a higher risk of re-revision in low volume hospitals, in contrast to our findings [5]. The difference in rTHA survival can potentially be explained by differences in case mix and by major infection revisions: 1) low volume centers might have less complex patients, and refer their most complex patients to high volume centers, 2) Low volume centers might have a higher threshold to revise vulnerable patients, and 3) they might have less resources in complex/ multidisciplinary care. Strengths of this study include the use of national registry data with 98% completeness. Limitations include that due to the retrospective study design, no assumptions can be made regarding causality. Additionally, the data does not include information regarding PROMs, conservative treatment of infected arthroplasties, and surgeon caseload volume.

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# 7

## Complications of Intubation in the Emergency Department: A Retrospective Study of 353 Patients at the Medical Center Leeuwarden

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**Achtergrond:** Intubatie is een ingreep die in ziekenhuizen veelvuldig wordt uitgevoerd. De ingreep brengt inherente risico's met zich mee, waaronder weefsel- of tandheelkundige schade, evenals verslechtering van vitale parameters, die levensbedreigende situaties kunnen veroorzaken. In de afgelopen jaren is in het buitenland steeds meer onderzoek gedaan naar intubatie op de spoedeisende hulp.[1-3]

Ondanks dat er meer informatie bekend is over de uitvoering van de intubaties, is er weinig onderzoek gedaan naar de complicaties die voorkomen bij intuberen. In 2011 voerde T.M. Cook een studie uit naar grote complicaties bij luchtwegmanagement in de UK.[4,5] De conclusie was dat minstens een op de vier grote complicaties tijdens intuberen waarschijnlijk ontstaat op de spoedeisende hulp (SEH) of de Intensive care (IC). Dit komt doordat patiënten op de SEH en IC over het algemeen complexere medische aandoeningen hebben en dus een hoger risico op complicaties.

Daarnaast werden andere oorzaken geïdentificeerd, zoals onvoldoende identificatie van hoog-risico patiënten, lagere intubatievaardigheden bij artsen, vertraagde herkenning van bijwerkingen en verkeerde interpretatie van capnografie. In Nederland is er nog geen onderzoek gedaan naar intubaties op de SEH en de complicaties die daarbij optreden.

**Doelstelling:** Het doel van deze studie was om inzicht te krijgen in de aard en incidentie van complicaties tijdens of kort na intubatie op de SEH van Medisch Centrum Leeuwarden (MCL) en om mogelijke geassocieerde factoren met het optreden van complicaties te identificeren.

**Methode:** Deze retrospectieve cohortstudie onderzocht complicaties bij geïntubeerde patiënten op de SEH van 1 januari 2019 tot 31 december 2023. Informatie voor elke intubatie werd verzameld uit het elektronisch patiëntendossier, EPIC. Om de benodigde gegevens uit de patiëntendossiers te verzamelen, werd gebruikgemaakt van een GCP-conform gegevensverzamelsysteem (met audittrail) genaamd Redcap. De primaire uitkomstmaat was de aard en incidentie van de waargenomen complicaties. De secundaire uitkomstmaat betrof het onderzoeken van mogelijke geassocieerde factoren met het optreden van complicaties.

**Resultaten:** In totaal werden 353 patiënten in de studie opgenomen. Complicaties traden op bij 56 (15,9%) patiënten, waarvan 26 gevallen van hypotensie, 16 van desaturatie en 9 van hypertensie. Bij 2 (0,6%) patiënten werd een hartstilstand waargenomen. Factoren die geassocieerd waren met een verhoogde kans op complicaties omvatten het gebruik van propofol als inductiemiddel, pulmonale en cardiale indicaties voor intubatie en meerdere intubatiepogingen.

**Conclusie:** De incidentie van complicaties tijdens intubatie op de SEH van het MCL is in lijn met internationale studies. De complicaties bestaan voornamelijk uit hypotensie, desaturatie en hypertensie. De onderzochte risicofactoren maken het mogelijk om hoogrisicopatiënten te identificeren en optimale behandelingsstrategieën te selecteren. Deze inzichten kunnen helpen om de incidentie van complicaties in de toekomst te minimaliseren.

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# 8

## Mitochondrial DNA in Plasma and Long-Term Physical Recovery of Critically Ill Patients: An Observational Study.

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**Background:** Post-Intensive Care Syndrome (PICS) poses a significant public health concern, with survivors of critical illness experiencing long-term physical, psychological, and cognitive challenges. Mitochondrial markers, such as mitochondrial DNA (mtDNA) damage and mtDNA amount in plasma (mtmass), have gained attention for their potential involvement in PICS. However, the long-term impact of mitochondrial status on patient recovery remains uncertain.

**Aim:** To assess the relationship between mitochondrial markers, measured at baseline and 12 months post-ICU discharge, and the long-term physical recovery status of Intensive Care Units (ICU) survivors.

**Methods:** This is a retrospective, single-centre, observational study with an analytical scope nested in a Frisian ICU survivors' cohort, as established by Beumeler et al., 2022. This study evaluated the relationship between the mitochondrial markers and long-term physical functioning (PF) in 43 ICU patients. Mitochondrial markers were measured via qPCR at baseline and 12 months post-ICU discharge. PF was assessed using the RAND-36 survey, categorizing patients into recovery (R) and non-recovery (NR) groups, based on age-adjusted PF scores. Descriptive statistics characterized the population, considering demographic and clinical factors. Differences between groups were evaluated, and correlation analyses explored associations between mitochondrial markers and PF scores.

**Results:** A total of 43 patients were included in this study, divided into recovery and non-recovery groups based on age-adjusted PF scores at 12 months post-ICU. Nineteen patients scored below recovery thresholds. No significant differences in mitochondrial markers between the two groups were identified. Furthermore, no significant correlations were found between mtmass and mtDNA damage at baseline

and 12 months with PF scores. However, mtmass decreased over time in the recovery (p-value <0.01) and non-recovery groups (p-value <0.01) (figure 1).

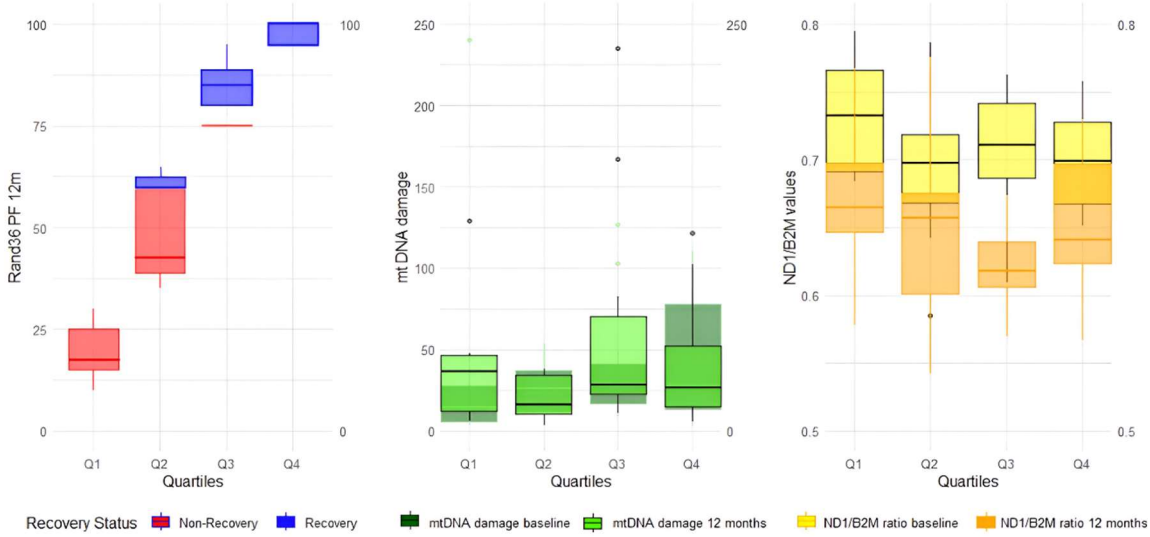


**Figure 1.** Distribution of mitochondrial values and physical functioning recovery status at 12 months post-ICU, in quartiles.
Boxplots display data with whiskers extending to the smallest and largest values within 1.5 times the interquartile range (IQR) from the first (Q1) and third quartiles (Q3), following Tukey's method. Outliers outside this range are shown as individual dots. The ND1/B2M ratio refers to the mitochondrial mass.

**Conclusion:** This study has provided insights into the distribution of plasma markers of mitochondrial dysfunction at baseline and 12 months post-ICU. No clear correlation was found between these markers and physical functioning. Further investigations are warranted to identify and target specific factors influencing ICU survivors' outcomes, ultimately improving their overall recovery and quality of life.

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# 9

## The value of the Central Sensitization Inventory in patients with axial spondyloarthritis

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**Background:** In many patients with axial spondyloarthritis (axSpA) pain persists despite anti-inflammatory medication. Quantitative Sensory Testing (QST) indirectly assesses altered somatosensory function, though its clinical practicality is limited. The Central Sensitization Inventory (CSI) could be an alternative in the initial assessment of Central Sensitization (CS).

**Aim:** This study aimed to investigate the value of the CSI in evaluating CS in patients with axSpA by 1) assessing somatosensory function related to CS with QST; 2) exploring associations between CSI, QST, patient[1]and disease characteristics and pain-related psychosocial factors.

**Methods:** Consecutive outpatients from the Groningen Leeuwarden AxSpA (GLAS) cohort underwent QST, including Pressure Pain Threshold (PPT), Temporal Summation (TS) and Conditioned Pain Modulation (CPM). Participants completed questionnaires assessing CS (CSI), illness perception (IPQ-R), pain-related worrying (PCS), fatigue (MFIS), anxiety/depression (HADS) and coping. QST measurements were stratified for CSI≥40.

**Results:** 201 patients with axSpA were included; 63% male, 64% radiographic axSpA, median symptom duration 12 years [IQR 5-24], mean ASDAS 2.1 ± 1.0. Patients with CSI≥40 had significantly lower PPTs and higher TS than CSI<40 ($p<0.004$). No significant differences in CPM were observed. In multivariable linear regression sex, PCS, IPQ-R Identity, MFIS and HADS anxiety were independently associated with CSI (78% explained variance).

**Conclusions:** In this large cross-sectional study in patients with axSpA, the CSI appears as a useful initial CS assessment questionnaire. When CSI scores indicate CS, considering pain-related psychosocial factors is important. These results emphasize the need for a biopsychosocial approach to manage chronic pain in patients with axSpA.

# 10

## Interrelationship of disease activity, central sensitization, psychosocial and lifestyle factors with axial spondyloarthritis

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**Background:** In a substantial part of patients with axial spondyloarthritis (axSpA), disease activity scores remain high despite anti-inflammatory treatment. This is possibly due to factors beyond active inflammation including different pain mechanisms and psychosocial factors.

**Aim:** Therefore, our aim was to build a biopsychosocial model to explore the interrelationships of Axial Spondyloarthritis Disease Activity Score (ASDAS) with central sensitization (CS), psychological and lifestyle factors in patients with axSpA.

**Methods:** Consecutive patients from the prospective Groningen Leeuwarden axSpA (GLAS) cohort were included in this cross-sectional study. Assessments included in the model were educational level, body mass index (BMI), questionnaires on CS (CSI), illness perception (IPQ-R), pain catastrophizing (PCS), coping (CORS), anxiety and depression (HADS), physical activity (mSQUASH) and ASDAS. Structural equation modelling (SEM), a multivariate analysis testing hypothesized interrelationships between variables, was applied to investigate the effects of CS, psychosocial and lifestyle factors on ASDAS.

**Results:** 332 axSpA patients were eligible for analyses of which 59% were male, median symptom duration was 21 years, and mean ASDAS was 2.2±0.9. The final SEM model had a satisfactory fit (RMSEA=0.061 (95% CI 0.46-0.75), CFI=0.926). Illness perception, CSI and BMI had direct, significant, effects on ASDAS. Psychological wellbeing and educational level were significantly indirectly associated with ASDAS through illness perception.

**Conclusions:** Our analyses exploring the interrelationships of biopsychosocial factors related to ASDAS showed that factors beyond inflammation, especially illness perception and CS, seem to contribute significantly to ASDAS in patients treated for axSpA in our standard-of-care cohort, confirming the need for a biopsychosocial approach.

# 11

## The Effect of Two Years of Secukinumab Treatment on Bone Metabolism in Patients with Radiographic Axial Spondyloarthritis: Results from Daily Clinical Practice

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**Background:** Radiographic axial spondyloarthritis (r-axSpA) is characterized by inflammation, which may result in both excessive bone formation and bone loss. This is reflected in bone-related outcomes including the development of radiographic bone formation with syndesmophytes and ankylosing of the spine, vertebral fractures (VF), and low bone mineral density (BMD). Bone turnover markers (BTM) are biomarkers that are released during bone remodeling by osteoclasts and osteoblasts and, therefore, in vivo mirroring bone metabolism (resorption, formation, and mineralization) and are fundamental to bone-related outcomes in axSpA.

Treatment with TNF-α inhibitors (TNFi) and interleukin-17 inhibitors (IL17i) has been proven to be effective in decreasing disease activity in patients with r-axSpA (1). Regarding bone metabolism, it was observed that BTM balance favors collagen formation (PINP) and mineralization (BALP) during the first 3 years of TNFi, which was accompanied by significant improvement of BMD especially of the lumbar spine (2). Previously, we reported no changes in serum levels of BTM during 1 year of treatment with IL17i secukinumab (3). The objective of this study was to explore bone-related outcomes and BTM more long term, during 2 years of secukinumab treatment in r-axSpA patients in daily clinical practice.

**Aim:** Our objective was to explore bone-related outcome and bone turnover markers (BTM) during 2 years of secukinumab treatment in patients with radiographic axial spondyloarthritis (r-axSpA) in daily clinical practice.

**Methods:** Included were consecutive r-axSpA outpatients from the Groningen Leeuwarden axSpA (GLAS) cohort treated with secukinumab for 2 years. At baseline and 2 years, spinal radiographic damage was assessed using the modified Stoke Ankylosing Spondylitis Spinal Score (mSASSS; 0-72), cervical facet joint involvement according the "de Vlam" scoring method (0-15) and radiographic vertebral fractures (VF) using the "Genant" method (grade 0-3). At all visits, BTM reflecting collagen resorption (serum type I collagen C-telopeptide; sCTX), collagen formation (procollagen type 1 N-terminal peptide; PINP) and bone mineralization (bone-specific

alkaline phosphatase; BALP) were measured and expressed in Z-scores to correct for the normal influence of age and gender.

**Results:** 17 r-axSpA patients were included; 53% male, mean age was 47±15 years, mean Ankylosing Spondylitis Disease Activity Score (ASDAS) 3.9±1.2, and 53% was biological naïve. The median 2-year progression rates were 1.1 for mSASSS and 0.5 for facet joints, which was less than the smallest detectable change. One traumatic VF (grade 3) occurred. Serum levels of sCTX and PINP remained stable during secukinumab treatment and BALP decreased significantly after 2 years, with median 0-2 year change in Z-scores of +0.1, -0.4, and -1.2, respectively.

**Conclusion:** This explorative study of r-axSpA patients treated with secukinumab in daily clinical practice showed low radiographic spinal progression during 2 years of follow-up. Collagen resorption and formation markers remained stable, whereas mineralization marker BALP decreased significantly after 2 years. Our results are in line with the results of in vitro studies demonstrating that inhibition of IL17-A resulted in suppression of osteogenic differentiation with significant decrease in mineralization.

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# 12

## Patient acceptable symptom state in relation to disease activity in patients with axial spondyloarthritis

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**Background:** Patient acceptable symptom state (PASS) is the level beyond which patients consider themselves well. This concept can help to interpret results of clinical trials and enhance patient-physician communication in daily clinical practice.

**Aim:** Our aim was to explore the association of PASS with disease activity according to ASDAS in two standard-of-care cohorts of patients with axial spondyloarthritis (axSpA).

**Methods:** Patients from the Groningen Leeuwarden Axial Spondyloarthritis (GLAS) cohort visiting the outpatient clinic between May 2016 and October 2019 were included in this cross-sectional analysis. Patients from SpA-net visiting the outpatient clinic between June 2020 and June 2022 were used as an external validation cohort. All patients were asked to fill out the PASS question: “Considering all the different ways axSpA is affecting you and if you stay in this state for the next months, do you consider your current state satisfactory? (”yes”= PASS /”no”= non-PASS). Area under the Receiver Operator Curve (AUC) was used to analyze the accuracy of the ASDAS and the optimal cut-off value to predict PASS according to the highest Youden’s index.

**Results:** Of the 673 included axSpA patients from the GLAS cohort, 63% were male, mean age (±SD) was 48±14 years, median (IQR) symptom duration 19 (11-31) years and mean (±SD) ASDAS 2.3 (±0.9). In total, 514 patients (76%) reported PASS. These patients had significantly lower ASDAS compared to non-PASS patients (mean 2.0 ±0.8 vs. 3.2 ±0.8, p<0.001). The ASDAS showed good accuracy to predict PASS, with an AUC of 0.84 (95% CI 0.80-0.85). The optimal cut-off value of ASDAS for PASS was 2.7 (sensitivity 77%, specificity 78%). In total, 214 patients reported PASS and had high disease activity according to ASDAS (≥2.1). This is 44% of all patients reporting PASS. Results were

similar in the 159 patients from SpA-Net: 121 (76%) reported PASS and had significantly lower ASDAS than patients reporting non-PASS (mean 2.1 ±1.0 vs. 3.0 ±0.8, p<0.001). The optimal cut-off value of ASDAS for PASS in SpA-Net was 2.6 (sensitivity 76%, specificity 69%).

**Conclusion:** In axSpA patients from two standard-of-care cohorts, 76% reported an acceptable symptom state. A considerable number of patients reporting an acceptable symptom state still have high disease activity according to endorsed ASDAS cut-offs.

# 13

## Higher levels of physical activity are associated with less evasive coping, better physical function and quality of life in patients with axial spondyloarthritis

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**Background:** Axial spondyloarthritis (axSpA) is a chronic inflammatory rheumatic disease that is characterized by inflammation of the sacroiliac joints and the spine. The majority of patients with axSpA experience pain, stiffness and fatigue, which can lead to limitations in daily activities, social participation and impaired physical activity (PA) (1,2). The level of PA is generally lower in patients with axSpA compared to in healthy controls (3,4). Specifically patients with axSpA who have high disease activity tend to be less physically active (5). However, disease activity alone does not fully explain these differences in PA and other aspects, such as psychosocial factors, may also play a role. Anxiety and depression, which are more common in patients with axSpA than in the general population, and the type of coping strategies used by axSpA patients might influence PA. To our knowledge, there is no data on which patient-, disease- and psychosocial-related factors are associated with lower daily PA in axSpA.

**Aim:** To evaluate daily physical activity (PA) in relation to psychosocial factors, such as anxiety, depression and different types of coping strategies, as well as patient- and disease-related factors in patients with axial spondyloarthritis (axSpA).

**Methods:** Consecutive outpatients from the Groningen Leeuwarden AxSpA (GLAS) cohort completed the modified Short Questionnaire to assess health-enhancing PA (mSQUASH), Hospital Anxiety and Depression Scale (HADS) and Coping with Rheumatic Stressors (CORS) questionnaires, as well as standardized patient- and disease-related assessments. Univariable and multivariable linear regression analyses and comparison of lowest and highest PA tertiles were performed to explore associations between the HADS, CORS, patient- and disease-related factors and PA.

**Results:** In total, 84 axSpA patients were included; 60% male, mean age 49 (SD ±14) years, median symptom duration 20 (25th-75th percentiles: 12-31) years, mean ASDAS 2.1 (±1.0). Higher PA levels were significantly associated with better scores on patient-reported disease activity (BASDAI), physical function (BASFI) and quality of life (ASQoL). Furthermore, higher levels of PA were associated with less impact of axSpA on wellbeing and lower HADS depression scores. In the multivariable linear regression model, less use of the coping strategy 'decreasing activities' (β: -376.4; p 0.003) and lower BMI (β:-235.5; p: 0.030) were independently associated with higher level of PA. Comparison of patients from the lowest and highest PA tertiles showed results similar to those found in the regression analyses.

**Conclusion:** In this cohort of axSpA patients, higher levels of daily PA were associated with better patient-reported outcomes and lower depression scores. Additionally, the passive coping strategy "decreasing activities" and lifestyle factor BMI were independently associated with PA. Besides anti-inflammatory treatment, coping strategies and lifestyle should be taken into account in the management of individual axSpA patients. Incorporating these aspects into patient education could increase patient awareness and self-efficacy. In the future, longitudinal studies are needed to better understand the complex relationship between patient-, disease- and psychosocial factors associated with daily PA.

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# 14

## Invloed van dexmedetomidine op de hemodynamische status van IC patiënten

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**Achtergrond:** Dexmedetomidine is een selectieve alfa2-adrenoceptor agonist en wordt in de praktijk gebruikt voor lichte sedatie of als toevoeging bij diepe sedatie. Dexmedetomidine heeft een hogere selectiviteit voor de alfa2-adrenoceptor dan het voorheen gebruikte clonidine, hierdoor werkt het middel vooral centraal en minder op de perifere receptoren. Vanuit deze theorie zou dexmedetomidine minder vaak hemodynamische bijwerkingen moeten geven. Echter, het is onduidelijk hoe vaak dexmedetomidine tot belangrijke hemodynamische bijwerkingen leidt in de dagelijkse praktijk.[1-3]

**Doel:** Het doel van dit onderzoek is inzichtelijk te krijgen bij welk percentage patiënten er hemodynamische bijwerkingen optreden na het toedienen van dexmedetomidine.

**Methode:** Een single center retrospectieve cohortstudie op een closed format 20-bed Intensive Care in een tertiair opleidingsziekenhuis bij volwassenen die tussen begin 2019 en eind 2023 dexmedetomidine toegediend hebben gekregen, al dan niet in combinatie met andere sedativa en analgetica. Patiënten die bezwaar hebben gemaakt voor het gebruik van hun data of 48 uur voor start van dexmedetomidine behandeld zijn geweest met clonidine zijn geëxcludeerd. Het primaire eindpunt is het percentage patiënten met hemodynamische bijwerkingen, gedefinieerd als een nieuw ontstane hypotensie (MAP <65 mmHg) en/of nieuw ontstane bradycardie (hartfrequentie <60/min) en/of stijging in noradrenalinedosering van minimaal 0,03mcg/kg/min één uur na toediening van de maximale dosering dexmedetomidine op de eerste dag van de behandeling ten opzichte van één uur voor de start van de behandeling.

SPSS 28 (Statistical Package for Social Sciences) werd gebruikt voor de analyse. De distributie van variabelen werd bepaald op basis van visuele beoordeling van het histogram. Normaal verdeelde variabelen worden gepresenteerd als gemiddelde met standaarddeviatie, niet-normaal verdeelde variabelen als mediaan met *interquartile range*. Dichotome variabelen worden weergegeven als percentage. Vergelijking

tussen patiënten met en zonder hemodynamische bijwerkingen vond, afhankelijk van het type data, plaats met de Fisher exact test, t-test of Mann Whitney U test.

**Resultaten:** In totaal hebben 503 patiënten dexmedetomidine gekregen. Hiervan zijn 8 geëxcludeerd wegens bezwaar tegen datagebruik en 41 wegens behandeling met clonidine. 454 patiënten zijn geïncludeerd, waarvan bij 423 alle data voor het primaire eindpunt compleet waren. Bij 34% (145/423) van de patiënten is er sprake van een nieuw ontstane hypotensie, een nieuw ontstane bradycardie en/of stijging in noradrenalinebehoefte.

Bij deze groep is de vochtbalans in de eerste 24uur na start dexmedetomidine significant positiever dan in de groep zonder bijwerkingen (579,46ml ± 990,51 vs. 201,68ml ± 965,45, p<0,001). Patiënten met hemodynamische bijwerkingen werden significant korter behandeld met dexmedetomidine (0,92 dag [0,44-2,02] vs. 1,57 dagen [0,67-3,07], p=0,03), waren korter op de IC opgenomen (7 dagen [4-14] vs. 10 dagen [6-19], p=0,007) en hadden minder beademingsdagen (3,64 dagen [1,44-7,84] vs. 5,92 dagen [2,21-13,27], p=0,004), zie tabel 1.

**Conclusies:** Bij één derde van de patiënten die in de afgelopen 5 jaar dexmedetomidine toegediend heeft gekregen op de IC in het Medisch Centrum Leeuwarden zijn er hemodynamische bijwerkingen opgetreden. Dit percentage komt overeen met de resultaten van een nog niet gepubliceerde, maar reeds op congres gepresenteerde prospectief gerandomiseerde trial.[4] Vervolgonderzoek zal worden gericht op het identificeren van subgroepen die gevoeliger zijn voor het optreden van hemodynamische bijwerkingen.

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**Tabel 1**. Kenmerken gehele groep patiënten, patiëntengroep met hemodynamische bijwerkingen (POS) en patiëntengroep zonder hemodynamische bijwerkingen (NEG).

| | *Alle patiënten, n = 423* | *POS, n = 145 (34%)* | *NEG, n = 278 (66%)* | *p-waarde* |
|---|---|---|---|---|
| ***Demografie*** | | | | |
| *Man, n* | 308 (73%) | 109 (75%) | 199 (72%) | 0,49 |
| *Leeftijd, jaren* | 66 [56-72] | 66 [57-73] | 66 [56-72] | 0,607 |
| *BMI, kg/m²* | 27,1 [24,5-30,0] | 26,7 [24,1-29,5] | 27,3 [24,7-30,1] | 0,336 |
| ***Opname*** | | | | |
| ***Opnametype*** | | | | 0,296 |
| *Spoedoperatie, n* | 80 (19%) | 32 (22%) | 48 (17%) | |
| *Geplande operatie, n* | 57 (14%) | 22 (15%) | 35 (13%) | |
| *Medisch, n* | 286 (68%) | 91 (63%) | 195 (70%) | |
| *Opnameduur zkh, dagen* | 19 [11-31] | 17 [11-29] | 19 [11-32] | 0,236 |
| *Opnameduur IC, dagen* | 9 [5-18] | 7 [4-14] | 10 [6-19] | 0,007 |
| *Beademingsduur, dagen* | 5,22 [1,76-10,91] | 3,64 [1,44-7,84] | 5,92 [2,21-13,27] | 0,004 |
| ***Comorbiditeit*** | | | | |
| *Cardiovasculaire insuff., n* | 14 (3%) | 7 (5%) | 7 (3%) | 0,254 |
| *COPD, n* | 60 (14%) | 16 (11%) | 44 (16%) | 0,19 |
| *Diabetes Mellitus, n* | 72 (17%) | 24 (17%) | 48 (17%) | 0,892 |
| ***Kenmerken bij opname*** | | | | |
| *Mechanische ventilatie, n* | 355 (84%) | 121 (83%) | 234 (84%) | 0,889 |
| *CPR, n* | 72 (17%) | 32 (22%) | 40 (14%) | 0,056 |
| *Apache III score* | 74 [60-92] | 78 [62-95] | 73 [59-90] | 0,58 |
| ***Medicatie*** | | | | |
| *Duur dexmed, dagen* | 1,25 [0,54-2,69] | 0,92 [0,44-2,02] | 1,57 [0,67-3,07] | 0,03 |
| *Max. dexmed, mcg/kg/u* | 1,02 [0,59-1,40] | 0,93 [0,60-1,40] | 1,08 [0,58-1,39] | 0,623 |
| *Antihypertensiva, n* | 243 (57%) | 79 (55%) | 164 (59%) | 0,408 |
| *Inotropie, n* | 57 (14%) | 22 (15%) | 35 (13%) | 0,457 |
| ***Hemodynamische parameters*** | | | | |
| *Hartfrequentie 1u voor start Dexmed, bpm* | 93 ±18 | 90 ± 19 | 94 ± 17 | 0,081 |
| *MAP 1 u voor start dexmed, mmHg* | 86 ± 18 | 83 ± 17 | 87 ± 19 | 0,03 |
| *Hartfrequentie 1u na max dexmed dag 1, bpm* | 82 ± 17 | 75 ± 18 | 85 ± 16 | <0,001 |
| *MAP 1u na max dexmed dag 1, mmHg* | 77 ± 18 | 66 ± 17 | 82 ± 16 | <0,001 |
| *Vochtbalans 24u na start dexmed* | 329,17 ± 989,05 (n=403) | 579,46 ± 990,51 (n=136) | 201,68 ± 965,45 (n=267) | <0,001 |

BMI Body Mass Index; COPD Chronic Obstructive Pulmonary Disease; CPR Cardiopulmonale Resuscitatie; MAP Mean Arterial Pressure.

# 15

## Patients' Perspectives on Axial Pain in Relation to Inflammation and Structural Damage in a Large Cohort of Axial Spondyloarthritis Patients

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**Background:** Axial spondyloarthritis (axSpA) is a chronic inflammatory rheumatic disease characterized by sacroiliitis and spondylitis. Despite elaborative research, no sensitive or specific objective test or biomarker is available to measure disease activity. Patients with axSpA mainly rate disease activity on experienced symptoms such as pain (1). Currently, disease activity in axSpA can be measured with the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and preferably with the Ankylosing Spondylitis Disease Activity Score using the C-reactive protein level (ASDASCRP), which is a combination of patient-reported items from the BASDAI and the level of general inflammation marker C-reactive protein (CRP) (2, 3). In daily clinical practice, there are patients who consistently report high scores on these disease activity assessments irrespective of therapy (4). However, besides active inflammation, the experienced pain may also be related to the presence of structural damage in the spine or to altered pain mechanisms.

**Aim:** The objective of this study was to explore to what extent patients with axial spondyloarthritis (axSpA) link experienced pain in the neck, back, and hips to inflammation and/or structural damage.

**Methods:** Patients from the Groningen Leeuwarden Axial Spondyloarthritis (GLAS) cohort visiting the outpatient clinic between 2016 and 2019 filled out two additional questions in relation to the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) question 2: (1) "To what extent do you think the pain you experience in your neck, back, and hips is related to inflammation caused by axSpA?" and (2) "To what extent do you think the pain you experience in your neck, back, and hips is related to damage of the spine and joints caused by axSpA?" Answers had to be depicted on a numeric rating scale from 0 (none) to 10 (very much); a difference of ≥2 points between the scores of these questions was considered clinically relevant in favor of the highest scoring question.

**Results:** A total of 688 patients with axSpA (24% with nonradiographic axSpA [nr-axSpA]) were included (62% male, mean ± SD age 48 ± 14 years, and mean ± SD Ankylosing Spondylitis Disease Activity Score [ASDAS] 2.3 ± 1.0). Seventy-five percent of patients could not link the origin of their pain, 15% linked axial pain predominantly to inflammation, and 10% linked axial pain predominantly to damage. Patients in the inflammation group were younger, had shorter symptom duration, were more frequently diagnosed with nr-axSpA, had higher ASDASCRP , had more often elevated CRP levels, had fewer comorbidities, had better spinal mobility, and had less spinal radiographic damage.

**Conclusions:** In our large observational cohort, the majority of patients with axSpA could not differentiate the origin of experienced axial pain. If patients were able to link axial pain to clinical inflammation or damage, it was in concordance with clinical assessments and radiographic outcome, which may be helpful in establishing the origin of pain and supporting better patient-centered treatment decisions.

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# 16

## Pre- and Post-Implementation Analysis of an AKI Alert in Medisch Centrum Leeuwarden

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**Background:** Acute Kidney Injury (AKI) complicates 20% of hospital admissions(1) and is associated with prolonged hospital stay, increased mortality and development of chronic kidney disease and end stage kidney disease.(2) Timely guideline based management can prevent further deterioration of kidney function and improve AKI-associated outcomes.(3) Prior research has shown low adherence to these recommendations.(4) To enhance guideline adherence, electronic alerts have been developed to inform the physician of AKI in their patient, and providing general management advice, with varying success.(5) In January of 2024, an electronic AKI alert was implemented in Medisch Centrum Leeuwarden.

**Methods:** We conducted a pre-post intervention study in a large teaching hospital in the Netherlands. Hospitalized patients who developed AKI were included. The pre-intervention cohort consisted of patients developing AKI over one year, from January 2023 to December 2023. In January 2024, an AKI alert was implemented. Patients admitted from February 2024 to July 2024 constituted the post-intervention cohort. AKI was identified using an algorithm based on KDIGO criteria for serum creatinine (an increase of >50% per week or >26 µmol/L within 48 hours compared to baseline).

Patients were included only if their hospital stay exceeded 48 hours. Patients were excluded if they deceased or were started on palliative care within 48 hours after the occurrence of AKI. We recorded the occurrence of interventions recommended by the guideline in both groups, as well as patient and renal outcomes during and after hospitalization.

**Results:** The pre-alert group consisted of 890 hospitalizations, and the post-alert group consisted of 374. Baseline characteristics of both cohorts were similar, although patients in the pre-alert group were significantly older (72.1 vs. 70.7 years, p=0.043). Overall, 30.4% of AKIs occurred on a surgery ward. There were no significant differences in recommended actions (see Table 1) across both groups. Most notably, no differences were seen in cessation of nephrotoxic or antihypertensive medication across both groups. Furthermore, clinical consultation of a nephrologist occurred less

often in the post-alert group (8.7 vs 7.2%). Although not statistically significant, fewer patients reached stage 3 AKI (2.2% vs. 1.1%), and mortality during hospitalization was lower in the post-intervention group (4.5% vs. 4.0%). Kidney function upon discharge was similar in both groups (eGFR 57.1 vs. 57.5 ml/min/1.73 m²). Hospital stay was also similar in both groups. After three months, kidney function in the pre-alert group was better (eGFR 54.5 vs. 49.4 ml/min/1.73 m², p=0.098) compared to the post-alert group, though fewer patients in the post-alert group had reached three months of follow-up.

**Table 1.** Recommended management actions.

| | Pre-alert group (n=890) | Post-alert group (n=374) | P-value |
|---|---|---|---|
| *AKI mentioned in discharge letter* | 51.9% (n=462) | 52.9% (n=198) | 0.785 |
| *Nephrotoxic agents ceased (overall)* | 17.1% (n=153) | 15.8% (n=59) | 0.565 |
| *Antihypertensives ceased (when applicable), within 24h* | 34.7% (n=242/697) | 32.6% (n=92/282) | 0.201 |
| *Antihypertensives ceased (when applicable), within 48h* | 51.4% (358/697) | 48.6% (137/282) | 0.169 |
| *Clinical consultation of nephrologist* | 8.7% (n=77) | 7.2% (n=27) | 0.463 |
| *Start or increase of intravenous fluids within 48 hours* | 43.4% (n=386) | 46.3% (n=173) | 0.378 |
| *Kidney ultrasound performed (overall)* | 6.2% (n=55) | 4.0% (n=15) | 0.160 |
| *Urine screening performed (overall)* | 14.9% (n=133) | 14.2% (n=53) | 0.789 |
| *Follow-up with nephrologist post discharge (overall)* | 5.4% (n=48) | 6.7% (n=25) | 0.444 |

**Conclusion:** During the first three months after implementation of the AKI alert, we found no evidence of altered quality of care or outcomes in hospitalized patients with AKI. Improved visibility of the alert and awareness of AKI care may improve guideline adherence rates.

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# 17

## Klinisch relevante interventies van de behandeling met orale psychofarmaca bij bariatrische patiënten

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**Achtergrond:** Obesitas, een groeiend gezondheidsprobleem in Nederland, verhoogt het risico op diverse comorbiditeiten zoals hart- en vaatziekten, diabetes mellitus, en psychische stoornissen, wat leidt tot een verhoogde mortaliteit en verminderde kwaliteit van leven. Bariatrische chirurgie, gecombineerd met leefstijlinterventies, is de meest effectieve behandeloptie voor significante gewichtsreductie en verbeterde gezondheidsuitkomsten. Bij deze chirurgie beïnvloeden anatomische veranderingen in het maagdarmkanaal de farmacokinetiek van orale medicijnen, waaronder psychofarmaca, wat de medicijnblootstelling beïnvloedt. Dit vormt een uitdaging voor therapeutische behandeling en vereist nauwkeurige monitoring om veilige en effectieve behandelingen te waarborgen. Er is beperkte kennis over de veranderende blootstelling aan psychofarmaca na bariatrische chirurgie, echter tonen onderzoeken aan dat medicijnspiegels variëren, zoals bij lithium en tricyclische antidepressiva (1, 2).

**Doel:** Dit onderzoek heeft als doel de prevalentie van klinisch relevante interventies van orale psychofarmaca te bepalen bij patiënten die een bariatrische ingreep hebben ondergaan, en te onderzoeken hoe deze interventies verband houden met veranderingen in plasmaspiegels.

**Methode:** Een retrospectieve studie werd uitgevoerd met behulp van elektronische patiëntendossiers. Data werd verzameld betreffende de periode januari 2017 tot en met december 2023 van patiënten die in het Medisch Centrum Leeuwarden bariatrische chirurgie hebben ondergaan en in gebruik waren van lithium, een TCA (amitriptyline, clomipramine, dosulepine, doxepine, imipramine, maprotiline, nortriptyline) of clozapine. Baseline karakteristieken, aanwezigheid van interventie en

beschikbare plasmaspiegels werden verzameld preoperatief en tot 1 jaar postoperatief.

**Resultaten:** Totaal werden 164 patiënten geïncludeerd waarbij in 16,5% (n = 27) van de patiënten een interventie werd geobserveerd binnen 1 jaar na bariatrische chirurgie. In 2 (1,2%) patiënten heeft er een interventie plaatsgevonden op basis van plasmaconcentraties. Pre- en postoperatieve plasmaspiegels waren bepaald in 3 (1,8%) patiënten. Patiënten in gebruik van clozapine hadden significant meer kans op een interventie en patiënten met psychofarmaca voor de indicatie neuropathische pijn hadden significant minder kans op interventie (p < 0,05) (tabel 1).

**Tabel 2.** Baseline karakteristieken van de studie populatie.

| ***Karakteristieken*** | **Interventie, ja; n = 27** | **Interventie, nee; n = 137** | **p** |
|---|---|---|---|
| *Geslacht, vrouwelijk; n (%)* | 24 (88,9) | 126 (92,0) | 0,600 |
| *Leeftijd op operatiedatum, jaren; mediaan (IQR)* | 52 (14,0) | 52 (15,5) | 0,421 |
| *BMI, kg/m²; mediaan (IQR)* | 40,9 (8,3) | 41,7 (6,8) | 0,264 |
| *Etniciteit, Kaukasisch; n (%)* | 17,0 (96,3) | 83,0 (92,7) | 0,694 |
| ***Labwaarden*** | | | |
| *Nierfunctie* | | | |
| *eGFR 10 – 30 ml/min/1,73m², n (%)* | 0 (0,0) | 1 (100,0) | |
| *eGFR 30 – 50 ml/min/1,73m², n (%)* | 1 (50,0) | 1 (50,0) | |
| *eGFR 50 – 90 ml/min/1,73m², n (%)* | 1 (33,3) | 2 (66,7) | 0,320 |
| *eGFR > 90 ml/min/1,73m², n (%)* | 2 (40,0) | 3 (60,0) | |
| *Onbekend, n (%)* | 23 (15,0) | 130 (85,0) | |
| *Natrium, gemiddelde (±SD)* | 136,0 (1,41) | 140,6 (1,99) | 0,564 |
| *Kalium, gemiddelde (±SD)* | 4,55 (0,212) | 4,23 (0,359) | 0,522 |
| ***Geneesmiddel in gebruik[a]*** | | | |
| *Lithium, n (%)* | 0 (0,0) | 3 (2,2) | 0,581 |
| *TCA, n (%)* | | | |
| *Amitriptyline, n (%)* | 19 (70,4) | 111 (81,0) | 0,212 |
| *Clomipramine, n (%)* | 2 (7,4) | 11 (8,0) | 0,636 |
| *Nortriptyline, n (%)* | 4 (14,8) | 12 (8,8) | 0,257 |
| *Overige TCA's, n (%)* | 0 (0,0) | 1 (0,7) | 0,835 |
| *Clozapine, n (%)* | 2 (7,4) | 0 (0,0) | 0,026* |
| ***Indicatie*** | | | |
| *Depressie, n (%)* | 5 (18,5) | 33 (24,1) | 0,531 |
| *Psychiatrische stoornis, n (%)* | 3 (11,1) | 11 (8,0) | 0,704 |
| *Neuropathische pijn, n (%)* | 5 (18,5) | 55 (40,1) | 0,033* |
| *Overig, n (%)* | 3 (11,1) | 14 (10,2) | 1,000 |
| *Onbekend, n (%)* | 12 (44,4) | 33 (24,1) | |
| ***Chirurgische techniek*** | | | |
| *Gastric sleeve, n (%)* | 3 (11,1) | 7 (5,1) | |
| *Roux-en-Y gastric bypass, n (%)* | 14 (51,9) | 50 (36,5) | 0,102 |
| *One-Anastomosis gastric bypass, n (%)* | 10 (37,0) | 80 (58,4) | |

Afkortingen: *n*, aantal; *IQR*, interkwartielafstand; *SD*, standaard deviatie; *BMI*, body mass index; *TCA*, tricyclische antidepressiva; *eGFR*, geschatte glomerulaire filtratiesnelheid.

[a]combinaties weergegeven in beide categorieën * met p-waarde < 0,05

**Conclusie:** Dit onderzoek heeft aangetoond dat het aantal interventies omtrent de behandeling met psychofarmaca na een bariatrische ingreep beperkt is, maar dat incidenteel forse ontregelingen kunnen ontstaan. Het is daarom van belang om de behandeling met psychofarmaca zorgvuldig te monitoren na bariatrie. Spiegelbepalingen van psychofarmaca kunnen bijdragen aan het monitoren van het effect voor en na de bariatrische ingreep, echter is meer onderzoek nodig om dit te bevestigen.

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# 18

## Patient-reported drug-related problems after bariatric surgery: an observational study

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**Background:** The global surge in obesity is evident, with over 50% of Dutch adults in 2023 being overweight, of which 15% was classified as severely obese (BMI ≥ 30 $kg/m^2$) [1] For the patient population with obesity II (BMI ≥ 35 $kg/m^2$), metabolic bariatric surgery is the most effective treatment option. However, because of the altered anatomy of the gastrointestinal tract and the remission of comorbidities, bariatric surgery has an impact on drug efficacy and safety, potentially resulting in drug-related problems (DRPs).

**Aim:** The aim of this study is to investigate the occurrence of DRPs in patients who have undergone bariatric surgery at the Centre for Obesity North-Netherlands at the Medical Centre Leeuwarden.

**Methods:** This observational study surveyed 80 patients who underwent Roux-en-Y gastric bypass or one anastomosis gastric bypass surgery between August 1st, 2022, and January 1st, 2023, at the Medical Centre Leeuwarden to assess DRPs up to 8 months post-surgery. The data was collected via information in the electronic medical record (EMR) and via a digital survey in which patients were asked if they have experienced DRPs.

**Results:** A total of 69 DRPs was identified via the survey and/or EMR. Examples are displayed in Table 1. The majority of DRPs (28%) were attributable to overdosing. Most of the DRPs (78%) were reported in the patient surveys only and not in the EMR. Analysis showed no association between gender, age, BMI, surgery type, alcohol use, or smoking and DRPs.

**Table 1**: Prevalence and examples of DRPs (n=69).

| *DRPs* | N (%) instances of DRPs | Example of DRP |
|---|---|---|
| ***Drug choice*** | | |
| Unnecessary drug(s) | 11 (16 %) | Patient reported rosuvastatin as unnecessary. |
| ***Dosing*** | | |
| Overdosing | 19 (28 %) | Patient reported a possible overdose of hydrochlorothiazide leading to a severe hypokalemia which required a visit to the emergency room. |
| Underdosing | 7 (10 %) | Patient reported a possible underdosing of venlafaxine which resulted in experiencing anxiety post-surgery. |
| Sub-optimal formulation | 11 (16 %) | Patient reported a sub-optimal formulation with macrogol and electrolytes as this required enough water intake which is simply impossible after surgery. |
| ***ADR*** | 16 (23 %) | Patient reported hematuria after anticoagulant injections (nadroparin). |
| ***Other*** | 5 (7 %) | Patient reported a problem with cholecalciferol and calcium carbonate of which the reimbursement stopped January 1st, 2023, in the Netherlands. |

Abbreviations: n, number; DRPs, drug-related problems; ADR, adverse drug reactions.

**Conclusions:** Almost half of the patients experienced one or more DRPs after bariatric surgery, primarily due to overdosing. This highlights inadequate monitoring of comorbidities post-surgery and presents uncertainty about which healthcare provider has the responsibility and the overview of the patients' medication. Integrating pharmacists into inpatient and outpatient settings, with pharmacist-led interventions pre- and postoperatively, could potentially mitigate and reduce DRPs following bariatric surgery.

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# 19

## Ziekte Acceptatie en Controle vanuit het Subjective Health Experience-model als voorspellers van gezondheidsbeleving bij patiënten met psoriasis

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**Achtergrond:** De reumatologie, dermatologie en gastro-enterologie van het MCL zijn 2020 gestart met een project om ondersteunende zorg bij immunologische behandelingen meer op maat aan te bieden, uitkomsten te monitoren en in het consult te koppelen aan de patiënt. In het project zijn drie stadia te onderscheiden: 1. in kaart brengen van behoeften van patiënten en beschikbare vormen van ondersteunende zorg, 2. onderzoeken welke Patient-Reported Outcome Measures (PROMs) relevant zijn voor het meten van gezondheidsbeleving en 3. implementeren van de bevindingen in de klinische praktijk. Dit abstract focust zich op het tweede stadium.

De impact van auto-immuunziekten reikt verder dan fysieke verschijnselen en heeft een grote invloed op kwaliteit van leven. Om de gezondheidsbeleving van patiënten beter te integreren in zorg op maat, zou het gebruik van PROMs een goed hulpmiddel kunnen zijn [1]. De huidige PROMs zijn echter onvoldoende om dergelijke gepersonaliseerde zorg te begeleiden omdat ze onvoldoende de totale gezondheidsbeleving van patiënten representeren. Daarom is het 'Subjective experienced health (SHE) model' ontworpen [2]. Dit model ziet ziekte Acceptatie en gevoel van Controle (beide bepaalt met 3 vragen) als belangrijkste determinanten van gezondheidsbeleving. Dit model is ontworpen om te gebruiken als toevoeging op bestaande modellen om gezondheidsbeleving beter in kaart te brengen.

**Doelstelling:** Bepalen of ziekte Acceptatie en Controle voorspellingen van gezondheidsbeleving verbeteren voor individuen met psoriasis.

**Methode:** Vragenlijsten waren verstrekt aan een online panel van mensen met psoriasis (N=200) via marktonderzoeksbureau IPSOS. De vragenlijsten bestonden uit demografische karakteristieken en PROM's (EuroQol Five-dimensions (EQ5D), Dermatology Life Quality Index (DLQI)). Gegevens werden geanalyseerd met behulp van beschrijvende, betrouwbaarheids-, validiteits- en modelstatistieken (PLS-SEM; SmartPLS 4.1).

**Resultaten:** De uitkomsten van dit onderzoek suggereren dat de DLQI alleen gelimiteerde variantie voorspelt van gezondheidsbeleving ($R^2$=.17; zie figuur 1 Model 1). Het toevoegen van Controle en Acceptatie als mediators (Model 2) of Controle, Acceptatie en EQ5D (Model 3) zorgen voor een hogere voorspelling van gezondheidsbeleving ($R^2$=.49; alhoewel niet compleet significant voor Model 2). Model 4, met DLQI, Acceptatie en Controle samen als directe voorspellers van gezondheidsbeleving geeft de hoogste voorspelling ($R^2$=.55). De effect grootte is het grootste bij model 3. De modellen werden gezien als gedeeltelijk betrouwbaar omdat de waarden voor 'construct reliablility', geanalyseerd via Cronbach's alpha (α), rho_a en rho_c coëfficiënten, voor de meeste items boven de .70 waren (alleen niet DLQI (α=.68)) [3]. De 'discriminant validity' was voldoende omdat de 'heterotrait-monotrait ratios' onder .90 bleven [3].

**Conclusie:** Voorspelling van gezondheidsbeleving kan verhoogd worden door het toevoegen van Acceptatie en Controle, dan wel met of zonder EQ5D, als mediator. Op basis van dit onderzoek zou het gebruik van het SHE-model in de klinische praktijk een toevoeging kunnen zijn om behandelingen voor psoriasis meer op maat aan te bieden, uitkomsten real time te monitoren en in het consult deze terug te koppelen aan de patiënt. Bij het gebruik van dezelfde methode bij andere diagnoses waren vergelijkbare uitkomsten gevonden, waardoor deze conclusie verder getrokken kan worden naar de behandeling van immunologische ziektebeelden in het algemeen.

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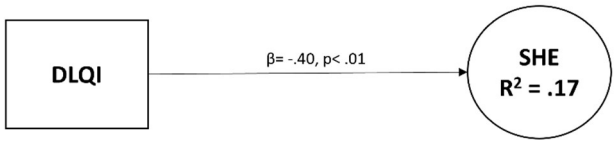
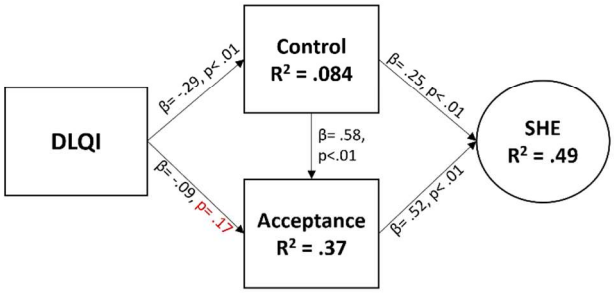
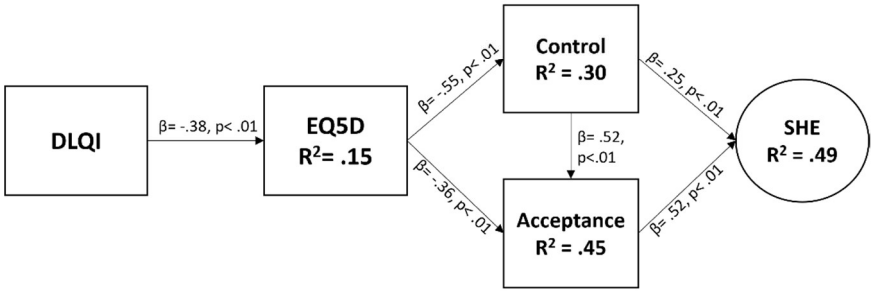
Model 1: DLQI direct op SHE



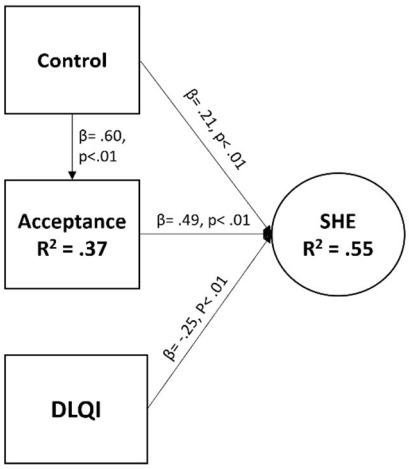

Model 2: DLQI via Controle en Acceptatie op SHE




Model 3: DLQI via EQ5D, Controle en Acceptatie op SHE




Model 4: Controle, Acceptatie en DLQI direct op SHE




**Figuur 3.** PLS-SEM analyse. Verschillende modellen voor het voorspellen van gezondheidsbeleving (SHE).

Effect grootte is weergegeven via gestandaardiseerde Beta-coefficienten (β), de significantie via p-waarden en de verklaarde variantie via R-kwadraat ($R^2$).

# 20

## Retrospectief cross-sectioneel long-COVID 19 onderzoek naar het verband tussen BMI en long-COVID klachten.

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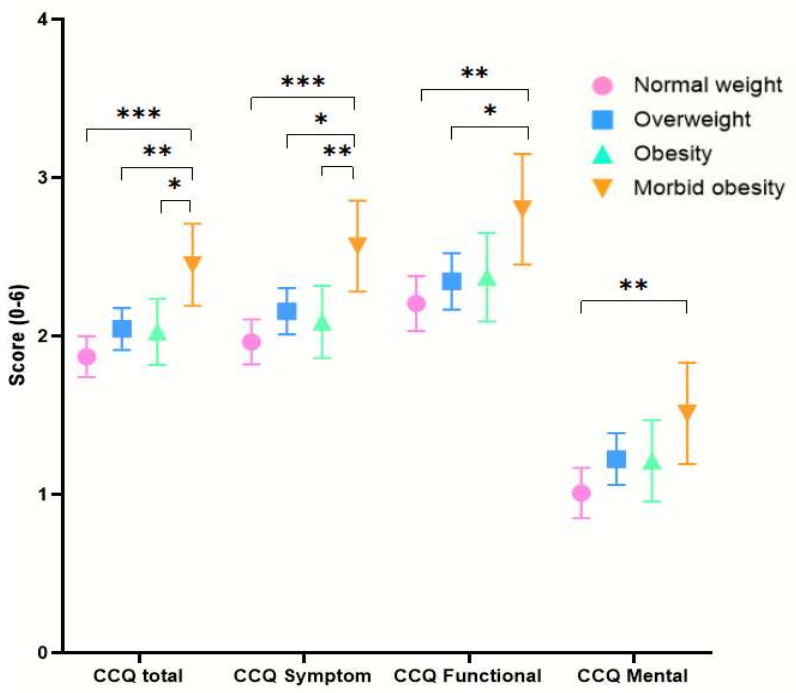
**Achtergrond:** In 2020 veroorzaakte het nieuwe coronavirus SARS-CoV-2 een wereldwijde pandemie met veel infecties en sterfgevallen (1). In mei 2020 werd erkend dat sommige mensen na herstel van de acute infectie aanhoudende symptomen vertoonden, een fenomeen dat long-COVID werd genoemd (2).
Long-COVID omvat meer dan 200 symptomen, wat de diagnose bemoeilijkt (3). De meest voorkomende symptomen zijn hersenmist, dyspnoe en vermoeidheid (4). Personen met een verhoogde BMI lopen mogelijk een groter risico op het oplopen van COVID-19 en een ernstiger ziekteverloop, maar of dit ook leidt tot meer langdurige klachten is nog onbekend (5).

**Onderzoeksvraag:** Dit onderzoek is opgezet om de associatie tussen BMI en long-COVID klachten te onderzoeken.

**Methode:** Dit is een retrospectief database onderzoek bij patiënten met aanhoudende klachten na COVID-19 (≥17 jaar), die tussen augustus 2020 en 2023 door de huisarts zijn verwezen naar de long-COVID poli in het Medisch Centrum Leeuwarden. De deelnemers hebben de Hospital Anxiety and Depression Scale (HADS), de Medical Research Council (MRC) dyspnoe schaal, en de Clinical COPD Questionnaire (CCQ) ingevuld. Daarnaast hebben zij spirometrie en laboratoriumonderzoek gedaan. Er is verder informatie verzameld over hun long-COVID klachten, COVID-19-infectie en werkstatus. De deelnemers zijn ingedeeld in vier categorieën op basis van hun BMI: normaal gewicht (18.5-24.9 kg/m$^2$), overgewicht (25-29.9 kg/m$^2$), obesitas (30-34.9 kg/m$^2$) en morbide obesitas (>34.9 kg/m$^2$). Verschillen in het klachtenpatroon tussen deze BMI-groepen zijn geanalyseerd met behulp van ANOVA, Chi-kwadraat, Kruskal-Wallis, logistische en lineaire regressieanalyses. Er is gecorrigeerd voor confounders; leeftijd, geslacht en aantal comorbiditeiten.

**Resultaten:** Voor dit onderzoek was data beschikbaar van 763 patiënten, waarvan 522 (68,4%) vrouwen en 241 (31,6%) mannen. N=292 (38.3%) hadden een normaal gewicht, 281 (36,8%) overgewicht, 116 (15,2%) obesitas en 74 (9,7%) morbide obesitas. Vrouwen (10,9%) hadden significant vaker morbide obesitas dan mannen (7,5%, p=0,03). De gemiddelde leeftijd was 47,6 jaar (SD: 13,9) en een hogere leeftijd was geassocieerd met een hoger BMI (p < 0,001).

Patiënten met morbide obesitas hadden significant meer last van dyspneu (82,4% vs 67,1%, p=0,018) en vergeetachtigheid (23,0% vs 13,0%, p=0,024) t.o.v. patiënten met een normaal gewicht. Patiënten met morbide obesitas scoren ook significant slechter op de CCQ en HADS vragenlijsten t.o.v. de normaal gewichtsgroep, zie Figuur 1. Patiënten met morbide obesitas hadden significant slechtere longfunctie-uitkomsten voor $FEV_1$ (geschatte gemiddelde ±standaard error van het gemiddelde) (92,6 ±1,73 vs 97,22 ±0,89 p=<0,001), maximale vitale capaciteit 89,99 ±1,81 vs 98,47 ±0,93 p=<0,001) en alveolair volume (5,34 ±0,11 vs 5,98 ±0,55 p=<0,001 vergeleken met normaal gewicht.




**Figuur 1.** Totale CCQ-scores per gewichtscategorie
Uitgedrukt in geschatte gemiddelden met 95% betrouwbaarheidsinterval.
*significant wanneer 0,05 < p-waarde > 0,01
** = significant wanneer 0,01 < p-waarde > 0,001
*** = significant wanneer p-waarde < 0,001

**Conclusie:** De resultaten van dit onderzoek laten zien dat mensen met overgewicht, en met name morbide obesitas, meer long-COVID klachten ervaren dan mensen met een normaal gewicht. Opvallend was het hoge aantal mensen met een verhoogd BMI (61% ≥25 kg/$m^2$) en (morbide) obesitas (25% ≥30 kg/$m^2$). Dit is aanzienlijk hoger dan de algemene Nederlandse bevolking (50% en 15%), wat suggereert dat mensen met een hoger BMI inderdaad een hoger risico hebben op langdurige klachten na COVID-19. Verder onderzoek is nodig om te zien hoe de symptomen, bloedwaarden en longfuncties zich ontwikkelen en veranderen over de tijd.

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# 21

## Bruikbaarheid van het model van Positieve Gezondheid in de ziekenhuissetting

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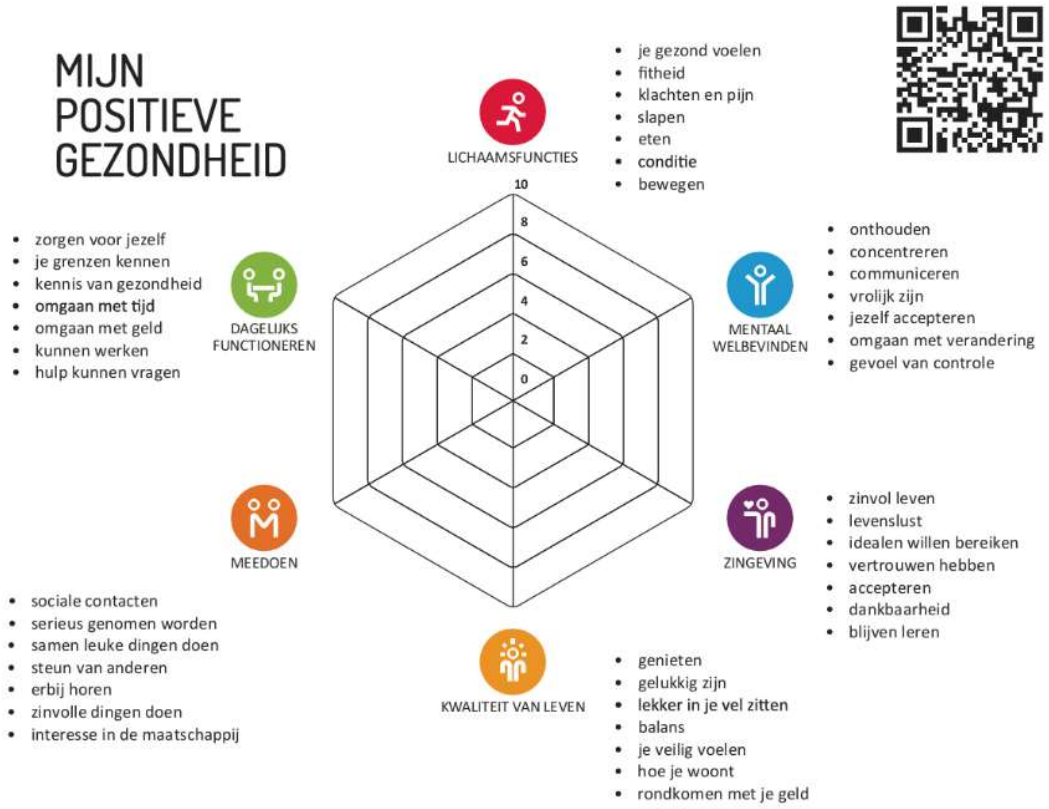
**Achtergrond:** Door de hoge werkdruk en toename van complexe zorgvragen is de ziekenhuiszorg steeds meer gericht op acute en fysieke zorg waardoor zicht op de 'hele' mens gemakkelijk verloren gaat en er meer wordt gehandeld vanuit het perspectief van de zorgverlener. Daarnaast schiet de aandacht van verpleegkundigen voor zelfmanagement-ondersteuning en eigen regie soms tekort (Holtrop, Andela & Van der Cingel, 2022). Het model van Positieve Gezondheid (zie figuur 1) gaat uit van een meer holistisch beeld op gezondheid en helpt om zicht te krijgen op de ervaren gezondheid, op welke aspecten patiënten ondersteuning willen en doet een beroep op de eigen regie van patiënten.

**Doel:** Zicht krijgen op de ervaren gezondheid en zorgbehoeften van patiënten gedurende hun behandeltraject, met het model van Positieve Gezondheid. Dit om zicht te krijgen op de bruikbaarheid van het model voor het beter aansluiten bij de zorgbehoeften van patiënten en ondersteuning van eigen regie en zelfmanagement in de ziekenhuissetting.

**Methode**: Bij vier patiëntengroepen met een chronische en/of complexe aandoening is met het model Positieve Gezondheid in kaart gebracht hoe ze gedurende hun behandeltraject hun gezondheid beleefden en wat positieve en negatieve ervaringen waren. Daarbij lag het model zichtbaar voor hun en werden ze uitgenodigd om daar over te vertellen. Vier bachelor verpleegkunde-studenten voerden de interviews uit onder begeleiding van een verpleegkundig onderzoeker.

**Resultaten:** De interviews met 17 patiënten (6 OHCA, 4 Kahler, 3 PPPD, 4 PAV) hadden een open karakter waarin patiënten gemakkelijk en veel vertelden over hun ervaren gezondheid en wat hun ziekte- en behandeltraject betekende voor hunzelf en hun naasten. De fysieke klachten waren passend bij hun aandoening en behandeling en hadden duidelijk veel invloed op de andere aspecten van gezondheid, zoals Meedoen, Dagelijks functioneren, Kwaliteit van leven en Mentaal welbevinden. Steun van naasten was voor alle patiënten erg belangrijk gedurende hun hele behandeltraject maar een aantal gaf aan dat er tijdens de ziekenhuisopname weinig aandacht voor de naasten was. Ook sloot de 'standaard' zorg niet altijd aan bij hun specifieke behoeften.




**Figuur 1.** Model Positieve Gezondheid
(Wat is het? - Institute for Positive Health (iph.nl))

**Conclusie:** Sterk is dat het model faciliteert in een open gesprek waarin patiënten gemakkelijk en veel vertellen over hun ervaren gezondheid. Mede door de losse structuur tijdens het interview hadden de patiënten een actieve rol in het aangeven van onderwerpen die voor hun belangrijk waren. Hun verhaal geeft een brede kijk op de patiënt als persoon en zijn specifieke situatie, iets wat bij de meer gestandaardiseerde verpleegkundige anamnese en gedurende de opname gemakkelijk wordt gemist. Het geeft daarmee meer handvatten voor de verpleegkundigen om beter aan te sluiten bij de specifieke behoeften van de patiënt en voor hoe en waar ondersteuning voor eigen regie en zelfmanagement mogelijk is.

Vervolgonderzoek wordt ingezet op het bespreken van de resultaten met verpleegkundigen met de vraag of en hoe dit hun helpt bij het bieden van passende zorg en ondersteuning van eigen regie en zelfmanagement. Daarnaast moet worden onderzocht of en hoe het model geïntegreerd kan worden tijdens de ziekenhuisopname van deze patiënten.

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# 22

## Focus on Experienced Anxiety Related to an Emergency Department visit, FEAR-ED

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**Background:** Previous studies(1,2) have demonstrated that rates of depression and anxiety are higher among patients presenting to the emergency department (ED) compared to the general population. In Europe the prevalence of anxiety among patients in the ED (and its potential consequences) remain under-explored.

**Aim:** The aim of this study is to determine the prevalence of anxiety in the ED of a Dutch hospital and to investigate the various factors influencing anxiety and consequences associated with anxiety.

**Methods:** Quantitative data on anxiety and pain were collected using the Generalized Anxiety Disorder 7 (GAD-7), the Visual Analogue Scale for Anxiety (VAS-A) and the Numeric Pain Rating Scale (NPRS). Additionally, open-ended questions were used to assess the source and timing of anxiety, its possible impact on the timing of the ED visit and the perception of pain.

**Results:** A total of 139 patients were included in this study. Of these patients, 36% reported feelings of anxiety or tension during the interview. According to the GAD-7, 38.1% of patients experienced some level of anxiety, whereas the VAS-A indicated that a total of 27.3% of patients experienced some degree of anxiety. No association was found between anxiety and pain scores. For 60% of the patients, the anxiety or tension began prior to their arrival at the ED. None of the patients indicated that their anxiety had led to a delay in presenting to the ED, however, 8 patients reported delaying their visit to their General Practitioner. The predominant reason for experiencing anxiety or tension was uncertainty regarding the situation.

**Conclusions:** A substantial proportion of patients attending the ED reported feelings of anxiety or tension. Previous research indicates that such feelings can significantly impact the perceived quality of care, well-being and patient satisfaction, and may also influence pain perception. It is crucial to acknowledge the prevalence of anxiety in the ED and understand its underlying causes. Given that uncertainty is a major factor, it is recommended that physicians and nurses not only provide clear explanations of the ED workflow and anticipated investigations, but also actively inquire about and explore the reasons behind the patients anxiety or tension.

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# 23

## Improvement in small airways disease is associated with more clinical improvement in severe asthma patients treated with anti-interleukin-5 therapy

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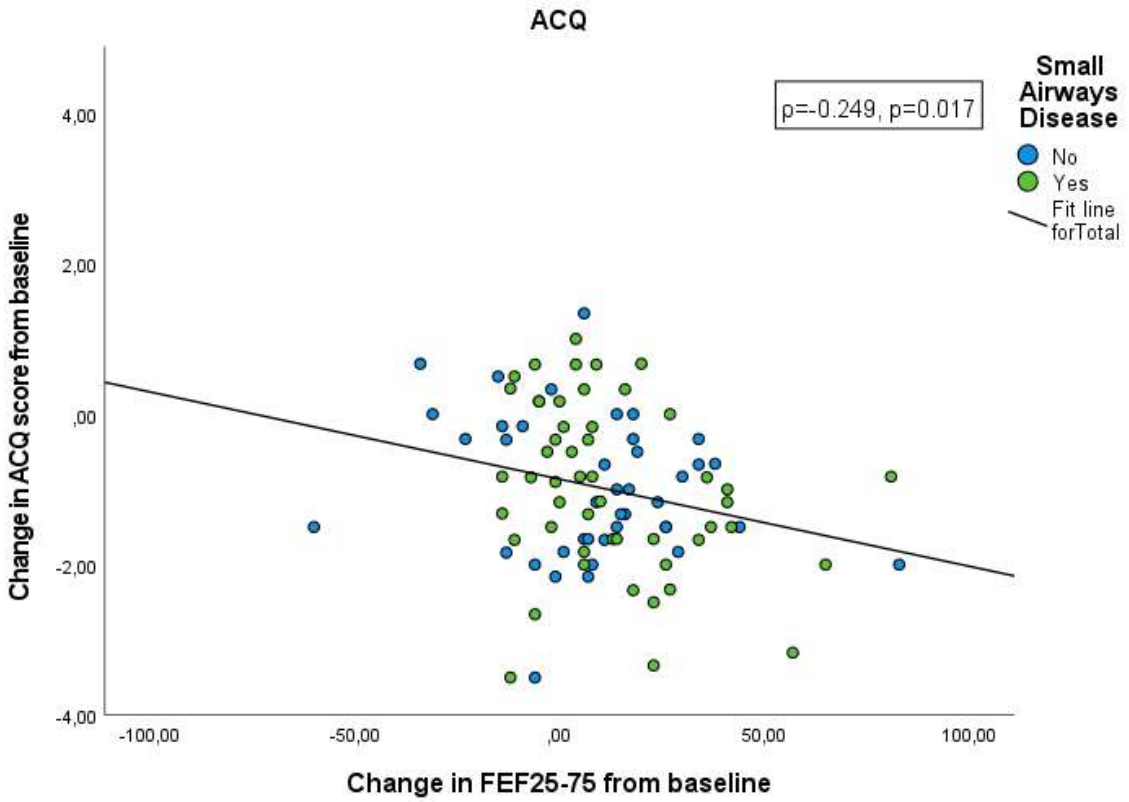
**Background:** The extent of small airways disease (SAD) in patients with asthma is associated with their level of asthma control. In patients with severe eosinophilic asthma, studies have shown that both SAD and clinical outcomes, including asthma control and quality of life, improve after treatment with anti-interleukin-5/-5 receptor(anti-IL-5(R)) (1-4). However, the relation between improvements in SAD and improvement in these clinical outcomes after treatment with anti-IL-5(R) in severe asthma remains unclear.

**Aims:** First, to assess the relationship between improvement in SAD and clinical outcomes (of asthma control and health-related quality of life) after 4 months of treatment with anti-IL-5(R). Second, to assess whether the extent of SAD at baseline predicts clinical improvement.

**Methods:** In this retrospective study, ninety-two patients with severe asthma treated with anti-IL-5(R) for 4 months were included. Patients completed the Asthma Control Questionnaire (ACQ) and Asthma Quality of Life Questionnaire (AQLQ), as well as spirometry at the baseline visit and at 4 month follow-up. SAD was defined as $FEF_{25-75}$ lower than the lower limit of normal. Associations between $FEF_{25-75}$ and change in questionnaire scores were analysed and adjusted for $FEV_1$.

**Results:** Improvement in SAD was associated with improvement in both questionnaire scores (ACQ $\rho$=-0.249, p=0.017; AQLQ $\rho$=0.267, p=0.011). After adjustment for $FEV_1$, these associations did not remain significant. Baseline SAD was not associated with improvement in both questionnaire scores. After adjustment for $FEV_1$, more baseline SAD was associated with a higher increase in AQLQ scores ($\beta$=-0.128, p=0.037).

**Figuur 1.**




**Conclusion:** Improvement in small airways disease (SAD) is associated with more improvement in asthma control and quality of life in severe asthma patients treated with anti-IL-5(R). Additionally, patients with a greater extent of SAD at baseline may experience more pronounced improvements in quality of life. These findings suggest that SAD is an important target for treatment in severe asthma, and the extent of SAD could be a valuable predictor of clinical response.

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# 24

## Quality of Life in Patients with Advanced Non–Small-Cell Lung Cancer: A Prospective real-world study

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**Background:** Risk-benefit weighing is crucial for patients with advanced NSCLC in making treatment decisions as these could lead to adverse events with negative impact on quality of life (QoL). Treatment with immune checkpoint inhibitors (ICI) and chemotherapy (CT) combined, are considered to be worse for the QoL compared to mono CT and ICI treatment. However In trials QoL often remains underreported thus real world data is required to verify this.

**Aim:** To assess and compare the real world QoL of stage III-IV NSCLC patients after initiation of first-line therapy.

**Methods:** This real world prospective single-center cohort study included patients starting CT, ICI, or CT + ICI between November 2018 and February 2023. The EORTC QLQ-C30 and LC13 were completed at baseline and 12 weeks, treatment satisfaction was measured using the CTSQ.

**Results:** 93 patients were included CT+ICI 59 (63.4%) CT: (17 (18.3%), ICI: 17 (18.3%). The median age was 69 years, 67% were male and most (93.5%) diagnosed at stage IV. 10 patients died before 12 weeks, 5 in both CT and CT+ICI groups. Baseline mean global health status was 67.59 (SD 23.16) in the CT+ICI group compared to the monotherapy ICI (58.33 (SD 19.34)) and CT (52.60 (SD 26.30)) groups (p=0.059).
At 12 weeks, patients treated with CT+ICI showed a trend towards lower global health and similar physical scores as those treated with CT and ICI (p=0.052 and p=0.388) Patients treated with CT+ICI were satisfied with their treatment (70.24 (28.1)), similar to the CT and IC (p=0.951).

**Conclusions:** QoL during potentially more toxic treatments with CT+ ICI remained similar compared to mono ICI or CT therapy in this large prospective real world cohort.

# 25

## The Efficacy and Feasibility of a Virtual Reality Exergame Intervention in Long Stay Intensive Care Unit Patients

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*First author

**Background:** Intensive care unit (ICU) admission is associated with profound muscle weakness (ICU-acquired weakness) [1]. Early mobilisation is critical for reducing long-term muscle weakness [2], with virtual reality (VR) emerging as a promising tool in rehabilitation [3]. This study aimed to establish the efficacy and assess feasibility and user-experience of a VR-exergame intervention on hand grip strength and upper extremity functionality in long-stay ICU patients compared to standard rehabilitation practices.

**Methods:** A randomised controlled trial was conducted at the Medical Centre in Leeuwarden (MCL), including ICU patients with stays of at least 48 hours. The intervention group engaged in VR-exergame sessions three times a week, for four weeks, in combination with standard care. The control group received standard care. Physical outcome measures included handgrip strength, upper limb function, and range of motion. Feasibility and user-experience was assessed through observations and semi-structured interviews.

**Results:** The results of this interim analysis indicated that no significant differences were found in handgrip strength, upper limb function, or range of motion between the intervention and control group. Nevertheless, the VR-exergame intervention is feasible for long-stay ICU patients. The thematic analysis of observational and interview data highlighted ease of use, immersion and engagement, physical and mental strain, feedback and support needs, and technical aspects of the VR intervention.

**Conclusion:** This study supports the feasibility of a VR intervention in ICU settings. However, the intervention did not seem more effective than standard rehabilitation practices. These findings should be interpreted with caution due to the small sample size and will need to be confirmed in a larger study.

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# 26

## Continuous glucose monitoring in patients with symptoms of hypoglycemia after bariatric surgery: a retrospective study.

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**Background:** Hypoglycemia is a known long-term complication after bariatric surgery and is associated with a reduced quality of life[1]. It is characterized by a post-prandial hyperinsulinemic effect as a result of elevated GLP-1 production which leads to fast glucose decline and typical hypoglycemic symptoms[2,3]. Yet, no consensus exists regarding the best diagnostic and therapeutic approach for these patients. Since 2019, in our bariatric center, patients complaining of hypoglycemic symptoms underwent continuous glucose monitoring (CGM) for 7 days whilst concomitantly logging complaints and food intake.

**Aim:** This study retrospectively analyses this data with the aim to better understand patient complaints in relation to glucose variations.

**Methods:** All patients who received GCM due to hypoglycemic complaints after bariatric surgery were included. Demographic data was extracted from the electronic patient files, as well as details regarding comorbidities and weight loss parameters. Glycemic variability (GV) was calculated for each patient using 4 different parameters: standard deviation (SD), coefficient of variation (CV) and mean and maximum amplitude of glucose excursions (MAGEavg/MAGEmax).

**Results:** Of the 245 cases analyzed 55.1% experienced at least 1 hypoglycemic episode. No significant associations were found between the occurrence of hypoglycemia and BMI, post-operative weight loss or the presence of preoperative diabetes mellitus type 2 (DMT2). GV was not significantly elevated in the group that experienced hypoglycemia. However, one group was identified (32% of total population, N=79) where despite the fact that no hypoglycemic episodes were measured (<3.0 mmol/l), post-prandial symptoms still occurred as a result of glucose fluctuations. All parameters for glucose variability were significantly elevated in this group (figure 1).

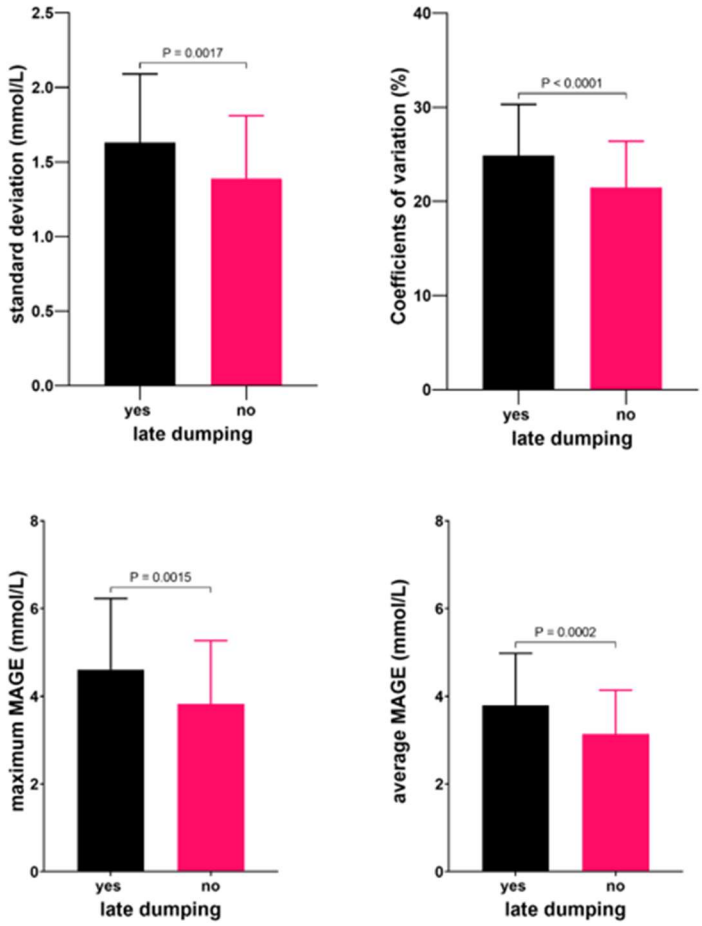


**Figure 1.** Parameters for glucose variability in patients with no hypoglycemia but post-prandial complaints (late dumping) vs. the rest of the study population

**Conclusions:** Hypoglycemia after bariatric surgery is a complex phenomenon and it remains difficult to define the risk factors associated with its development. Other studies have found associations between a larger total weight loss, lower BMI and the absence of DMT2 with the occurrence of hypoglycemia[4,5]. The lack of these findings in our study may be related to a selection bias since only symptomatic patients were included. CGM gives valuable insights regarding glucose fluctuations in relation to the development of postprandial symptoms. The study findings suggest that large post-prandial glucose fluctuations, even without the occurrence of a clinical hypoglycemia, can lead to the development of symptoms. Further studies should be aimed at understanding how glucose variability may be reduced through dietary advice or pharmacological treatment.

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# 27

## Evolution of treatment policy for patients aged 60 and older with de novo Acute Myeloid Leukemia between 2006 and 2024

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**Background:** Acute Myeloid Leukemia (AML) is a difficult to treat hemato-oncologic disease with overall poor outcomes[1]. In the past a multitude of chemotherapeutics have been evaluated in different dosages and regimens, alone and in combination with one another, to ultimately varying effect and tolerability[2][3][4]. However, the reductionist approach of a drugA versus drugB trial design cannot capture the complex interactions between patients, practitioners, available diagnostics, as well as local policies or preferences that exist in the real world. As many patients with AML today still experience relatively poor outcomes, the question may arise if over time the changing policies resulted in a net-survival-gain at all, even if newer treatments were indeed shown to be superior to older ones in a randomized control trial setting.

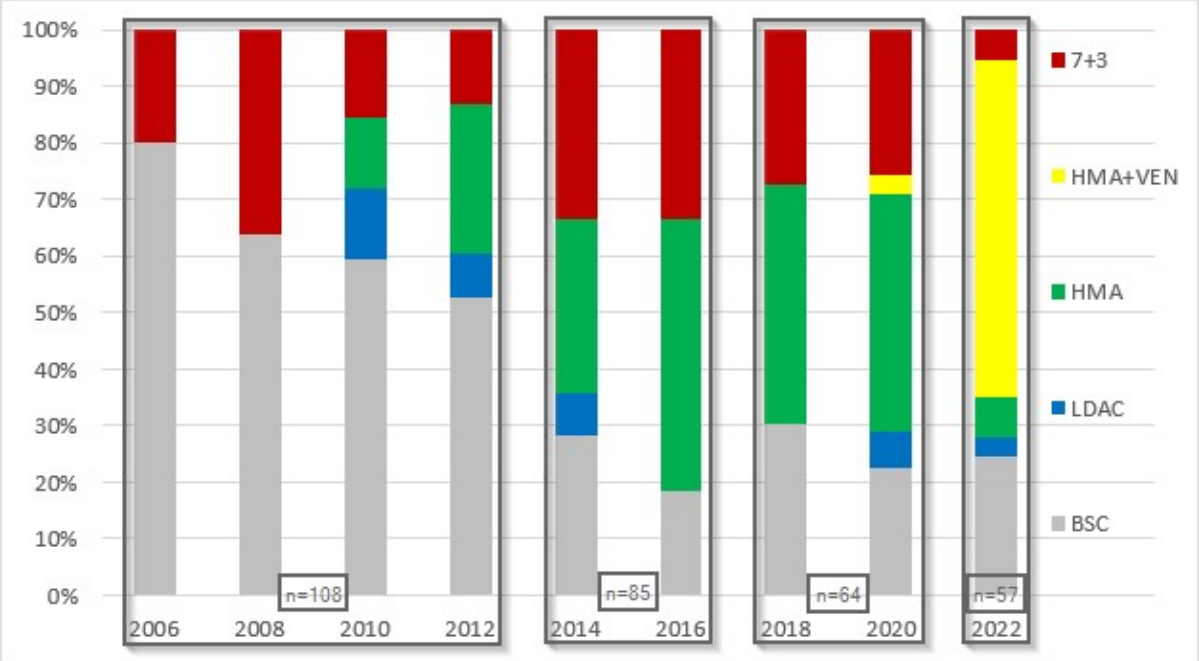
**Aim:** We aim to evaluate the gradual changes in policy of first-line treatment for patients aged 60 and older with de novo AML between 2006 and 2024 by overall survival, rate of patients treated with chemotherapy at all, early death, remission, and stemcel transplantation (SCT) in an unselected real-world population.

**Methods:** All patients aged 60 and older that were diagnosed with de novo AML in Friesland since 2006 were identified using HemoBase and included in this population-based retrospective cohort study, regardless of treatment received. Baseline data (demographics, performance status, EuropeanLeukemiaNet2017 genomic risk stratification, comorbidity burden) were gathered and first-line treatments were assessed. Achieving of complete remission (CR/CRi), receiving SCT, and mortality were registered. The dataset was analyzed by descriptive statistics, time to event analysis (Kaplan-Meier), and multivariate COX-regression.

**Results:** 314 patients (36% female, median age 74 (range 60-93), ELN2017 8% fav. / 28% int. / 37% adv. / 26% unknown) were included in the study population. Kaplan-Meier analysis showed that patients who were diagnosed later and received more novel therapy survived longer (KM-estimator=0.5 for 2006-2013 at 4 month, 2014-2017 at 7 month, 2018-2022 at 7 month, 2022-2024 at 11 month with 4, 8, 8, 14 month of median follow-up respectively). Rates of patients receiving any treatment increased over time and since 2019 almost all patients were offered at least a single cycle of chemotherapy

(figure 1). Rates of remission increased over calendar time (unknown, 38%, 34%, 70%) while rates of consolidation of remissions through SCT are decreasing (30%, 25%, 24%, 12%). The value of  adding Venetoclax to the therapeutic arsenal on remission rates and survival becomes apparent in the 2022-2024 group, although follow-up time is limited.

**Figure 1.**




**Conclusions:** As our understanding of the pathophysiology of AML improved over the last two decades, so did the available chemotherapy options, treatment guidelines, remission rates, and the achieved survival. More patients can be offered a befitting therapy and remission on average can be reached more often and more quickly (data not shown). Nevertheless, patients with adverse cytogenetic profile or an already impaired healthstate still pose a significant challenge to practitioners, especially when therapies are either too toxic or simply not effective enough.

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# 28

## Treatment and Outcomes of Patients with Acute Myeloid Leukemia in nine Dutch Teaching Hospitals after the Introduction of Venetoclax

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**Background:** In march 2022 the addition of Venetoclax (VEN) to hypomethylating (HMA) therapy was approved for reimbursement as firstline treatment for older patients with de novo Acute Myeloid Leukemia (AML) in the Netherlands[1]. HMA+VEN is expected to significantly improve outcomes compared to HMA alone based upon the VIALE-A trial where remission rates of 66% vs 28% and a median overall survival of 14.7 vs 9.6 month were found[2]. Real-world outcomes falling short of pharma funded clinical trials, for example due to exclusion of unfit patients, are common in oncology however[3]. Also, in the field of hemato-oncology a drug may be used differently than recommended by the patent holder rather quickly as care is highly individualized, with unknown impact on outcomes. On top of this some patients eligible for HMA+VEN may still have received HMA monotherapy, warranting a closer look.

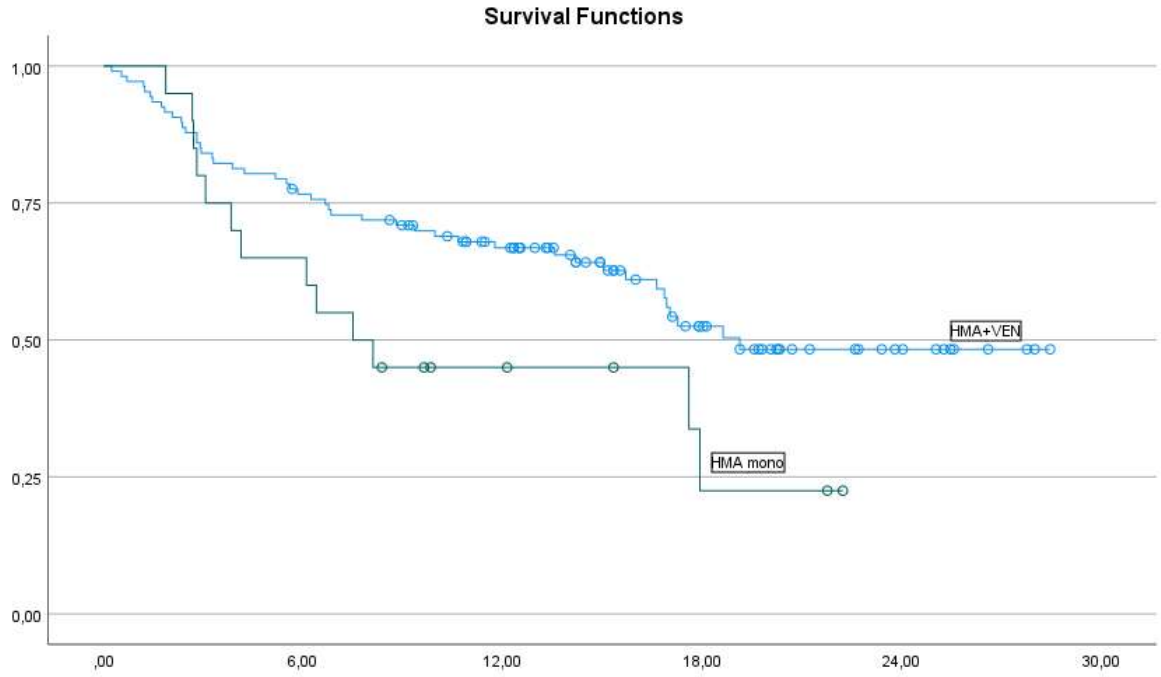
**Aim:** We aim to quantify rates of complete remission (CR/CRi), early death (2 month mortality), and overall survival in an unselected real-world population. Furthermore we aim to quantify how VEN was used in the real world (number of cycles, dosing, exposure, stopping).

**Methods:** A retrospective multicenter cohort study is being conducted using the electronic healthcare records of the participating hospitals. All patients aged 65 and older that were newly diagnosed with AML and received either Azacitidine (AZA) alone, Decitabine (DEC) alone, or either HMA in combination with VEN in the first 18 month after introduction of VEN were included in the population. Data is extracted manually using a REDCap eCRF and is analyzed with SPSS.

**Results:** A total of 144 patients (38% female, median age 73.0, ELN2017 genetic risk classification 11% favorable / 17% intermediate / 49% adverse) were included from nine hospitals and followed for a median of 14.4 months. 84 received AZA+VEN as firstline therapy, 23 DEC+VEN, 32 AZA alone, and 4 DEC alone and received a median number of 3, 5, 8, 8 cycles respectively. Of the HMA+VEN patients 59 (73%) reached CR/CRi, 45 (56%) of which within the first two cycles of chemotherapy. 62 (58%) switched to HMA monotherapy and completed a median of 3 HMA mono cycles after. The median overall survival is estimated at 19 month in the HMA+VEN and 7 month in the HMA

mono group (figure 1). As many patients are still alive at the moment of this preliminary analysis, estimates are prone to change. The reductions of VEN exposure from 28 of 28 cycle day to 21, 14, or 7, especially from the second cycle onward, mark the most frequently encountered deviation from SmPC and VIALE-A. VEN dose reductions from 400mg/day to 100mg/day, mainly but not only due to CYP interaction with azole-antifungals, were common (in 72% of cycles).

**Figure 1.**




**Conclusions:** The real world data on HMA+VEN in the Netherlands confirms and even exceeds the findings of the VIALE-A trials thus far, both in regards to remission rates and overall survival. Further research is necessary to determine the impact of reduced VEN dosing and cycle regimen on the cost-effectiveness of the treatment.

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# 29

## First Steps Towards Paediatric Home Monitoring in Friesland: Age- and Sex-Specific Physical Activity Percentiles for European and Frisian Children

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On behalf of the HELENA and the IDEFICS/ I.Family consortia (group authorships).

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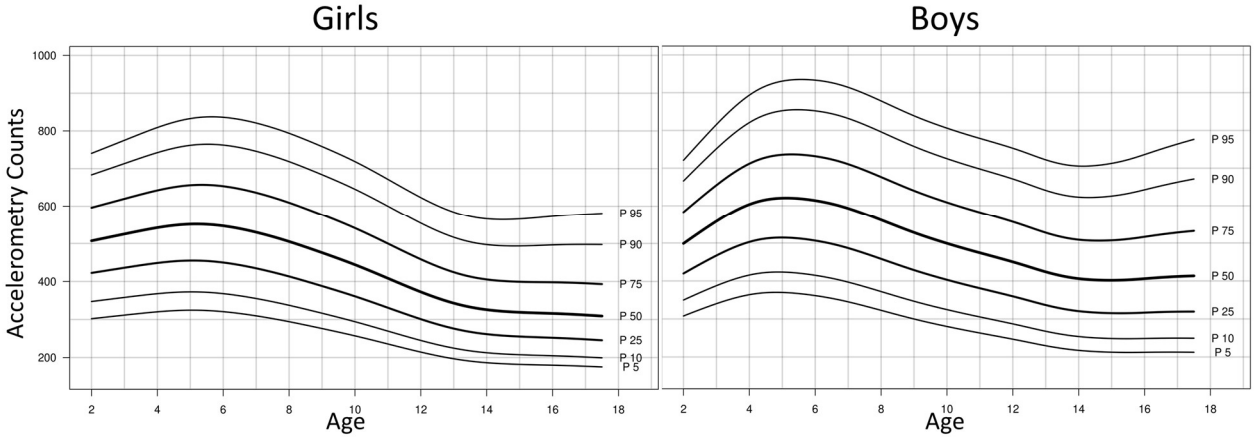
**Background:** In paediatrics, assessing physical activity (PA) has gained significant attention as an essential component in evaluating both health and disease.[1] Advances in wearable accelerometer technology and artificial intelligence have enabled objective measurement of PA levels in daily life. Children's engagement in PA is significantly impacted by their health status.[2] Thus, in paediatric illness, PA measured by accelerometry (PA-accelerometry) has gained interest as an informative indicator of disease severity that can be tracked over time.

However, a specific challenge in the paediatric population is the age dependency of PA. For the accurate interpretation of PA-accelerometry measurements, population-based reference percentile curves are required. These curves allow clinicians and researchers to evaluate the extent of deviation from normal for a particular age and monitor changes in PA over time. For European children, such reference curves are available only for specific fragmented age ranges.[3-4] The two major sources of European multinational paediatric population-based PA-accelerometry data collected using modern clinically validated accelerometers are the population-based HELENA and IDEFICS/I.Family studies.[3-5] Together these sources comprise healthy children aged >2 years from 12 European countries.

**Aim:** To provide age- and sex-specific percentiles for physical activity (PA) measured by hip-worn accelerometry derived throughout the full age range of European children by combining the available data sources.

**Methods:** Individual-level population-based PA data from HELENA and IDEFICS/I.Family studies were pooled and harmonized. Together these studies involved children aged 2-18 years from 12 European countries.[3-4] PA was measured using Actigraph accelerometers. Accelerometry recording was defined as valid if it lasted at least 6 hours on at least 2 weekdays and 1 weekend day. Primary outcomes included averaged counts per minute (CPM), sedentary time (SED), light PA (LPA), and moderate-to-vigorous PA (MVPA). Generalized Additive Models for Location, Scale and Shape were used to derive age- and sex-specific reference percentile curves for these outcomes.

**Results:** The combined cohort consisted of 11,645 children aged 2 to 18 years who contributed 14,610 valid accelerometry recordings, with a median accelerometer wear time of 6 days and a median wear time of 745 minutes per day. This dataset allowed for the successful construction of age- and sex-specific reference percentile curves for CPM, SED, LPA, and MVPA (CPM reference curves included as illustration below).




**Conclusions:** This study provides age- and sex-specific percentile curves for PA in European children, addressing a current gap in the availability of international full-age range accelerometry reference data. These curves can be instrumental for clinicians, researchers, and policymakers in interpreting PA-accelerometry measurements, assessing disease severity, tracking physical activity trends, and evaluating health interventions in paediatric populations.

By extending this research to include children from Friesland, we aim to ensure the relevance and applicability of the reference data for the local population. This will facilitate the adoption of home monitoring practices and the development of targeted interventions to enhance physical activity and health outcomes of children in the Frisian community. Within the MCL, we will use these reference curves to monitor chronic illnesses where PA plays a role such as asthma, obesity and diabetes.

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# 30

## Preoperative delabeling of penicillin allergy in orthopedic surgery patients; results of a pilot study

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**Background:** Approximately 10% of clinically admitted patients have a documented penicillin allergy. This potentially leads to the prescription of second-line perioperative antibiotic prophylaxis and a higher risk of surgical site infections.[1,2]

**Aim:** This study aims to evaluate the effect of preoperative delabeling of penicillin allergy on optimal perioperative antibiotic prophylaxis in orthopedic surgery patients.

**Methods:** Orthopedic surgery patients were screened preoperatively for a documented penicillin allergy using the electronic health record (EHR). The screening took place in July 2023. All patients with a documented penicillin allergy were included and invited for a specialized outpatient clinic. After performing a structured allergy history, it could be recommended to delabel the allergy directly, perform an oral challenge or additional diagnostic tests or to maintain the allergy. Furthermore, perioperative antibiotic prophylaxis prescriptions were recorded at baseline and after the pilot. Results were analyzed using descriptive statistics.

**Results:** 761 patients were screened and 35 patients (4.6%) with a penicillin allergy were identified. 80% of patients were female with a median age of 71 [IQR 64-76], 82.8% was scheduled for a joint replacement. 24 patients visited the outpatient clinic preoperatively, in 21 of these patients (87.5%) the penicillin allergy was delabeled. In 10 patients (41.7%) this decision was based on history and in 10 patients (41.7%) an oral challenge with amoxicillin was performed, 1 patient was planned for an oral challenge but did not show. Further diagnostics were initiated in 3 patients. In 1 of them the allergy was delabeled after intracutaneous testing, in 2 patients the results are pending. In all evaluated patients the administration of cephalosporins was onsidered safe.

Of the total group of identified patients with a documented allergy, 23 were delabeled (65.7%; 21 mentioned above and in 2 patients the penicillin allergy was delabeled by other healthcare professionals) and in 2 patients a penicillin allergy from an external source was not entered in the EHR.

After the pilot the percentage of second-line perioperative antibiotic prophylaxis with clindamycin was 2.5% of antibiotic prescriptions (1-10-23 to 1-4-24). At baseline in 2022 this percentage was 3.1%, before start of the antibiotic stewardship program to promote correct allergy registration this percentage was 7.2% (2018).
We analyzed all individual cases where clindamycin was administered after the pilot, none of these 14 prescriptions were medically necessary. In 4 patients the order for clindamycin had already been placed in the pre-admission orders and was not changed after delabeling the penicillin allergy, 6 patients were placed on the waiting list after the date of screening, 3 patients preferred postoperative analysis and in 1 patient clindamycin was wrongly prescribed due to a correct registration of amoxicillin intolerance.

**Conclusion:** A large proportion of documented penicillin allergies was delabeled preoperatively. Despite this, the reduction in the percentage of prescriptions of second-line perioperative antibiotics was smaller than expected. Based on our results, we decided to remove the predefined order for clindamycin from the pre-admission order set and to provide additional training. The effect of this intervention will be evaluated in further research.

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# 31

## Boosting Regional Nerve Block Efficiency: how to improve Time-to-Block placement for Hip Fracture Patients in the ED: An Observational and Delphi study

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**Background:** Pain due to hip fractures is often managed with opioids, which have significant side effects and pose a patient at risk for addiction.[1] Alternatively, regional nerve blocks (RNB) offer benefits but are underutilized, possibly due to perceived time constraints.[2]

**Aim:** This study aimed to assess the actual time needed for ultrasound-guided RNB placement in hip fracture patients in the Emergency Department (ED) and to explore methods to fasten RNB placement.

**Methods:** An observational study was conducted in the ED of an teaching hospital in the Netherlands where RNB are common practice. Actual time for RNB was measured for multiple time-frames from x-ray diagnosis confirmation until block completion. A two-round Delphi study identified improvement strategies to fasten time-to-analgesia with RNB.

**Results:** 20 measurements were obtained from the included participants. The actual mean time required for RNB administration was 84 minutes (SD 35). Actual application of RNB took 4 minutes (IQR 3-5). The time between x-ray confirmation and start of the block was 81 minutes (SD 31). The Delphi study highlighted prioritizing RNB placement upon diagnosis, time to indication, consultation of the ED-clinician, and material readiness as most important for process enhancement.

**Conclusion:** RNB placement for hip fractures itself is a fast procedure when the use of RNB is already common practice. However, the long time-to-analgesia could potentially be improved by improvement of logistical aspects. Prioritizing RNB placement upon diagnosis, time to indication, consultation of the ED-clinician, and material readiness are provided as most important tools for process enhancement. Further research is recommended to explore ultrasound application in hip fracture diagnosis.

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