Pélerìn Symposium 2022

ABSTRACTBOEKJE

DOKTERS VAN DE TOEKOMST

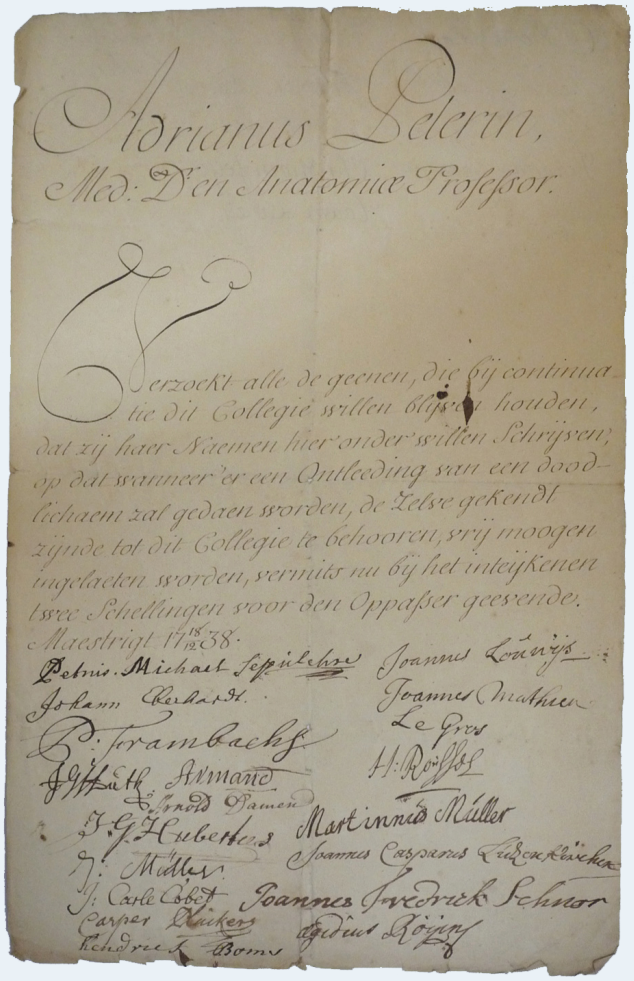
MET GASTSPREKER ERNST VAN DER PASCH

pélerìn
ARTS-ASSISTENTEN SYMPOSIUM

INHOUDS

OPGAVE

Voorwoord



De Stichting Pélerìn

Sinds 1996 kent de Stichting Pélerin de Pélerin Wetenschapsprijs toe aan het beste onderzoek verricht door een arts-assistent of promovendus in het Maastricht Universitair Medisch Centrum. Het symposium heeft als doel jonge artsonderzoekers te stimuleren en schept de mogelijkheid voor het presenteren van wetenschappelijk onderzoek.

Dit jaar zal het symposium voor de 26e keer plaatsvinden. Echter het fundament voor dit symposium werd al ruim 250 jaar geleden gelegd.

In 1738 werd Adrianus Pélerin benoemd als eerste professor in de anatomie en chirurgie in Maastricht. Hij stond aan de wieg van het medisch onderwijs in Maastricht. Met zijn anatomische lessen verbeterde hij de medische zorg in het militair hospitaal van de garnizoenstad Maastricht. Tevens was Pélerin verbonden aan de illustere School van Maastricht, een instelling die studenten voorbereidde op een verdere universitaire studie. Ofwel een Maastrichtse bacheloropleiding avant la lettre. Tijdens zijn opleiding verrichte hij onderzoek naar het op dat moment endemische pokkenvirus. In 1719 promoveerde Pélerin in Leiden op het proefschrift “de Variolis”. Zijn proefschrift heeft hoogstwaarschijnlijk bijgedragen aan de vroegtijdige invoering van de pokkenvaccinatie in Maastricht.

In de geest van Pélerin zijn zowel wetenschap als opleiding gebundeld in het jaarlijkse Pélerin Wetenschapssymposium.

De Pélerìn Stichting wil de kwaliteit en de continuïteit van academische patiëntenzorg bevorderen

Het Pélerinsymposium 2022

DOKTERS VAN DE TOEKOMST

Welkom bij de 27e editie van het Pélerin wetenschapssymposium! Het thema van dit jaar is "Dokters van de toekomst". Hoe ziet de geneeskunde er in de toekomst uit? En wat voor impact heeft dit op het beroep als arts? De gastspreker van dit jaar, Ernst van der Pasch, zal ons hier meer over komen vertellen. Zijn ervaring als theatermaker, caberatier, stand up comedian en TV-presentator komt hierin samen met zijn inhoudelijke kennis van de medische wereld.

Het jaarlijkse Pélerìn arts-assistenten symposium is dé mogelijkheid voor arts-assistenten, arts-onderzoekers en semi-artsen om wetenschappelijk onderzoek, verricht vanuit het Maastricht UMC+, onder de aandacht te brengen. Arts-assistenten, arts-onderzoekers en semi-artsen hebben ook dit jaar weer interessante abstracts ingediend. Tijdens het symposium zal de top 5 een presentatie geven over zijn/haar onderzoek, waarbij de beste presentatie beloond zal worden met de Pélerin Wetenschapsprijs. Daarnaast hebben genomineerden voor de Pitch prijs ook dit jaar weer interessante pitches opgenomen over hun onderzoek waarmee zij zullen meedingen naar de Pélerin Pitchprijs. Ook de winnaar van de Pélerin semi-arts prijs zal bekend worden gemaakt tijdens het Pélerin symposium, naar aanleiding van de poster-presentaties van de genomineerde semi-artsen tijdens de lunchsessie.

Kortom, wij zijn blij dat we dit jaar weer de mogelijkheid hebben om zoveel interessant onderzoek te kunnen presenteren aan u.
Wij wensen u een leerzame en vooral ook plezierige avond toe!

ORGANISATIE 2022

pélerìn
ARTS-ASSISTENTEN SYMPOSIUM

Al vroeg in het jaar beginnen wij achter de schermen met de voorbereidingen voor het symposium. De organisatie bestaat uit 7 gedreven, actieve maar vooral ook gezellige leden uit verschillende vakgebieden (zie hiernaast). Om de continuïteit van het symposium te waarborgen blijft elk lid voor 2 jaar in de organisatie, waarbij per jaar de helft wisselt. Zo kunnen we alle leerzame ervaringen van dit jaar weer meenemen in de organisatie van het Pélerìn symposium volgend jaar! Interesse? Kijk op onze website!

Van links naar rechts:
Roxanne Ploumen - Chirurgie
Michelle Bosman - Maag-Darm-Leverziekten
Maud van Dinther - Neurologie
Lars Hillege - Chirurgie
Karlijn Demers - Chirurgie/Maag-Darm-Leverziekten
Tim Brokken - Kindergeneeskunde
Quirien Robbe - Radiologie

WINNAARS VOORGAANDE EDITIE

Editie 2021

Pélerìn Wetenschapsprijs: Fieke Adan
Pitch prijs: Mohammed Ghossein
Semi-arts prijs: Anouk Camman

(foto's op volgorde van boven naar beneden)

Winnaars Pélerin Wetenschapsprijs voorgaande edities

1996 Drs. M.J. Bonten, afdeling interne geneeskunde
1997 Drs. H.W. van Straaten & drs. L. Koster-Kamphuis, afdeling kindergeneeskunde
1998 Drs. J.A. de Priester, afdeling radiologie
1999 Drs. R.J. van Oostenbrugge, afdeling neurologie
2000 Drs. L. Hofstra, afdeling cardiologie
2001 Drs. S.W.Olde Damink, afdeling algemene heelkunde
2002 Drs. E. Hoitsma, afdeling neurologie
2003 Drs. A.W. Nap, afdeling gynaecologie & obstetrie
2004 Drs. F.M. van Dielen, afdeling algemene heelkunde
2005 Drs. V.C. Cappendijk, afdeling radiologie
2006 Drs. M.A. Hoving, afdeling neurologie
2007 Drs. J. Trip, afdeling neurologie
2008 Drs. J.P. Derikx, afdeling algemene heelkunde
2009 Drs. M.G. Snoeijs, afdeling algemene heelkunde &
Drs. J.V. Been, afdeling kindergeneeskunde
2010 Drs. J.G. Bloemen, afdeling algemene heelkunde
2011 Drs. E.J. Rondagh, afdeling maag-, darm- & leverziekten
2012 Drs. A.H. Arits, afdeling dermatologie
2013 Drs. R.M. Schols, afdeling algemene heelkunde
2014 Drs. T. Brinkhuizen, afdeling dermatologie
2015 Drs. M. Dickman, afdeling oogheelkunde
2016 Drs. J. Beugels, afdeling plastische chirurgie
2017 Drs. M.W. Smulders, afdeling cardiologie
2018 Drs. M.H.E Jansen, afdeling dermatologie
2019 Drs. B. Corten, afdeling heelkunde
2020 Drs. V. Schiffer, afdeling gynaecologie en obstetrie

Genomineerden 2022

PÉLERÌN WETENSCHAPSPRIJS

MATTHIAS BUSCH - INTERNE GENEESKUNDE
TAMARA HUNDSCHEID - KINDERGENEESKUNDE
RICK VAN LANEN - NEUROCHIRURGIE
FLOOR PINCKAERS - RADIOLOGIE
ASHKAN REZAZADEH - MAAG-DARM-LEVERZIEKTEN

PÉLERÌN PITCH PRIJS

AARON IDING - INTERNE GENEESKUNDE
TOM WOLSWIJK - DERMATOLOGIE
REMON KORENBLIK - HEELKUNDE
LISANNE HOUBEN - HUMANE BIOLOGIE
APRIL VAN GENNIP - INTERNE GENEESKUNDE
JAMILLA WEDERFOORT - PLASTISCHE CHIRURGIE
ANNE COBUSSEN - RADIOTHERAPIE

PÉLERÌN SEMI-ARTS PRIJS

BOB BINDELS - HEELKUNDE
EVA CLAASSENS - HEELKUNDE
INGE CORVER - INTERNE GENEESKUNDE
FENJA DE RUIJTER - HEELKUNDE
JOSINE DOLMANS - KNO/HEELKUNDE
MONIEK DONKERS - INTENSIVE CARE
THIBAUT GUFFENS - RADIOLOGIE
KATO HEMAN - RADIOTHERAPIE
SOPHIE LAVEN - GYNAECOLOGIE/CARDIOLOGIE
GABRIELA PILZ DA CUNHA - HEELKUNDE
JENS SMITS - HEELKUNDE
TWAN VONCKEN - NEUROLOGIE

Genomineerd voor Pélerìn Wetenschapsprijs

Thrombin generation via the intrinsic pathway of coagulation and von Willebrand factor reflect disease severity in COVID-19.

Matthias H. Busch (1, 2), Sjoerd A.M.E.G. Timmermans (1, 2), Sander M.J. van Kuijk (3), Joop P. Aendekerk (2), Renée Ysermans (2), Daan PC van Doorn (2), Judith Potjewijd (1, 2), Marcel C.G. van de Poll (4), Iwan C.C. van der Horst (4), Jan G.M.C. Damoiseaux (5), Henri M.H. Spronk (2, 6), Hugo ten Cate (2, 6), Chris P. Reutelingsperger (2), Magdolna Nagy (2), and Pieter van Paassen (1, 2).

1 Dept. Nephrology and Clinical Immunology, Maastricht University Medical Center, Maastricht, the Netherlands
2 Dept. Biochemistry, Cardiovascular Research Institute Maastricht, Maastricht, the Netherlands
3 Dept. of Clinical Epidemiology and Medical Technology Assessment, Maastricht University Medical Center, Maastricht, the Netherlands
4 Dept. Intensive Care Medicine, Maastricht University Medical Center, Maastricht, the Netherlands
5 Central Diagnostic Laboratory, Maastricht University Medical Center, Maastricht, the Netherlands
6 Thrombosis Expertise Center, Maastricht University Medical Center, Maastricht, the Netherlands

Introduction
Both the intrinsic and extrinsic coagulation pathways are activated in Coronavirus disease 2019 (COVID-19) and associated with hypercoagulability, but data on the interplay between these pathways and its implication on clinical outcomes are limited. We longitudinally investigated the dynamics of the intrinsic and extrinsic pathway and von Willebrand factor:antigen (vWF:Ag) in relation to disease severity, thrombosis, and mortality in a prospective observational cohort of 220 patients with COVID-19.

Methods
Consecutive patients with COVID-19 who presented at the Maastricht University Medical Center from March 21, 2020, through April 28, 2020, were included. At presentation and during follow-up, activated factors in complexes with their natural inhibitors (i.e. FXIa:antithrombin (AT), FIXa:AT, thrombin:antithrombin (T:AT)), free VIIa and vWF:Ag were assessed.

Results
FXIa:AT, FIXa:AT, TAT, and vWF:Ag but not free FVIIa increased with disease severity and remained stable over time. FXIa:AT (r=0.64) and FIXa:AT (r=0.74) but not with FVIIa (r=0.16) correlated with T:AT, pointing to activation of the intrinsic pathway. FXIa:AT, FIXa:AT, and T:AT were higher in patients admitted to the ICU, thrombosis and/or non-survivors. Multivariable logistic regression indicated T:AT as a predictor for ICU admission (OR 1.449 [95% confidence interval [CI] 1.092-1.922]; P = 0.01) and thrombotic events (OR 1.336 [95% CI 1.025-1.740]; P = 0.032). Linear mixed models predicted that vWF:Ag increased over time in patients admitted to the ICU (+58 [95% CI 1-116] %; P < 0.001) and those who died (+77 [95% CI 15-137] %; P = 0.023).

Conclusion
We conclude that thrombin formation is driven via the intrinsic pathway in COVID-19. T:AT and vWF:Ag are important markers of disease severity, thrombosis and mortality.

Genomineerd voor Pélerìn Wetenschapsprijs

Association of Endotypes of Prematurity on Mortality: A Systematic Review, Meta-analysis and Meta-regression

TMT Hundscheid (1), E Villamor-Martinez (2), E Villamor (1)

1. Department of Pediatrics, Maastricht University Medical Center (MUMC+), School for Oncology and Reproduction (GROW), Maastricht, the Netherlands
2. Statistics Netherlands, 6412HX Heerlen, the Netherlands

IIntroduction
Preterm birth and its associated complications represents the leading cause of neonatal mortality worldwide. Pathophysiological pathways, or endotypes, leading to prematurity can be clustered into two groups: infection/inflammation and dysfunctional placentation. Despite the growing awareness about the role of these endotypes, triggering prematurity in its outcome, this variable is rarely taken into account in the models predicting mortality in the preterm infant. The present study systematically reviewed the association between the endotypes of prematurity and mortality.

Methods
PubMed and Embase were searched up to October, 2021. Key search terms included chorioamnionitis, hypertensive disorders of pregnancy (HDP), small for gestational age (SGA), intra-uterine growth restriction (IUGR), preterm birth, and mortality. Cohort studies examining infants with gestational age (GA)≤34 weeks and reporting data on the association between endotypes of prematurity and mortality were included. Chorioamnionitis represented the infection/inflammation endotype, while HDP and growth restriction (SGA/IUGR) represented the dysfunctional placentation endotype. PRISMA and MOOSE guidelines were followed. PROSPERO ID: CRD42020184843. A random-effects model was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs). Heterogeneity in effect size across studies was studied using random-effects meta-regression analysis. Differences in GA, sex, and antenatal corticosteroids were also analyzed.

Results
Of 4322 potential studies, 150 (597,083 infants) were included. Meta- analysis showed a positive mortality odds for chorioamnionitis (OR 1.41, 95% CI 1.24-1.59) and SGA/IUGR (OR 2.11, 95% CI 1.87-2.38), but a negative mortality odds for HDP (OR 0.65, 95% CI 0.60-0.71).). When analysis was restricted to extremely preterm infants (GA≤28 weeks), only the association between SGA/IUGR and mortality remained significant (OR 2.32, 95% CI 1.69-3.21). Additional meta-analyses showed that chorioamnionitis was associated with lower GA, while HDP and SGA/IUGR were associated with higher GA. Meta-regression showed a significant correlation between the differences in GA and the mortality odds.

Conclusion
Our data suggests that the infection/inflammation endotype has a greater overall impact on mortality risk as it is the most frequent endotype in the lower and more vulnerable GAs. However, when the endotype of placental dysfunction is severe enough to induce growth restriction, it is strongly associated with higher mortality rates even though newborns are more mature.

Genomineerd voor Pélerìn Wetenschapsprijs

Development and validation of a remote monitoring tool for real-world assessment of mild, moderate, and severe infections in Inflammatory Bowel Disease patients

A. Rezazadeh Ardabili (1,2), D.E.J.M. van Esser (1), D.S.J. Wintjens (1), M. Cilissen (1), D.S. Deben (3), Z. Mujagic (1,2), F. Russ (5), L.P.S. Stassen (2,4), A.A. Van Bodegraven (5), D.R. Wong (3), B. Winkens (6), D.M.A.E. Jonkers (1,2), M.J.L. Romberg-Camps (5), M.J. Pierik (1,2)

1. Department of Internal Medicine, Division of Gastroenterology and Hepatology, Maastricht University Medical Centre+, Maastricht, The Netherlands
2. School for Nutrition and Translational Research in Metabolism (NUTRIM), Maastricht University Medical Centre+, Maastricht, The Netherlands
3. Department of Clinical Pharmacy, Clinical pharmacology and Toxicology, Zuyderland Medical Centre, Sittard-Geleen, The Netherlands
4. Department of Surgery, Maastricht University Medical Centre+, Maastricht, The Netherlands
5. Department of Gastroenterology, Geriatrics, Internal and Intensive Care Medicine (Co-MIK), Zuyderland Medical Centre, Sittard-Geleen, The Netherlands
6. Department of Methodology and Statistics, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, The Netherlands

Introduction
Immunomodulators and biologicals are cornerstones in the current management of Inflammatory Bowel Disease (IBD), although associated with increased risk of infections. Post-marketing surveillance registries are important to assess this risk, but mainly focus on severe infections. Data on mild and moderate infections are scarce, yet these take longer to clear in immunosuppressed patients, and can substantially impact quality of life. We aimed to develop and validate a remote monitoring tool for real-world assessment of all infections in IBD patients.

Methods
Through a structured iterative process with input from IBD specialists and literature review, a 7-item Patient-Reported Infections Questionnaire (PRIQ) comprising 15 different types of infections was developed to measure infections with a recall period of 3 months. Infection severity was defined as mild (self-limiting or topical treatment), moderate (oral antibiotics/antivirals/antifungals) or severe (hospitalization, and/or IV treatment). Comprehensiveness and comprehensibility were ascertained through cognitive interviewing of 36 IBD outpatients. After implementation in myIBDcoach, a prospective, multi-centre, observational cohort study was performed between June 2020 and June 2021 in 584 IBD patients to assess diagnostic accuracy. Infectious events were manually crosschecked with GP and pharmacy data (Gold Standard). Agreement was evaluated using linear-weighted kappa and sensitivity and specificity (outcome: infection present/absent) were calculated. Cluster-bootstrapping was performed to adjust for in-patient level correlation.

Results
During development, patient understanding of the PRIQ was good and cognitive interviews did not result in reduction of items. Analysis of feedback from interviews resulted in addition of definitions to certain response options (e.g. definition for antivirals) and minor linguistic adjustments. During validation, 584 IBD patients (57.8% female, mean age 48.6 years [SD: 14.8], mean disease duration 12.6 years [SD: 10.9], n=323 Crohn's disease, n=261 ulcerative colitis) completed 1386 periodic assessments resulting in 1626 events. Linear-weighted kappa for agreement between the PRIQ and Gold Standard was 0.92 (bootstrap-adjusted 95%CI 0.89-0.94). As for diagnostic accuracy, sensitivity and specificity were 93.9% (bootstrap-adjusted 95%CI 91.8-96.0) and 98.5% (bootstrap-adjusted 95%CI 97.5-99.4), respectively.

Conclusion
The PRIQ is a valid and accurate remote monitoring tool to assess patient-reported infections in IBD patients. The PRIQ can be used for post marketing surveillance and in healthcare pathways of IBD.

Genomineerd voor Pélerìn Wetenschapsprijs

Glycocalyx degradation and impaired cerebral microcirculation in temporal lobe epilepsy patients.

RHGJ van Lanen (1,2), RHL Haeren (1,2), MAMJ van Zandvoort (3,4), J Staals (5), JTA Dings (1,6), G Hoogland (1,2,7), OEMG Schijns (1,2,6), H Vink (7), K Rijkers (1,2,6)

1. Department of Neurosurgery, Maastricht University Medical Centre, Maastricht, The Netherlands
2. School for Mental Health and Neuroscience (MHeNs), Maastricht University, Maastricht, The Netherlands
3. Department of Genetics & Cell Biology, Cardiovascular Research Institute Maastricht, Maastricht University, Maastricht, The Netherlands
4. Institute for Molecular Cardiovascular Research IMCAR, Universitätsklinikum, Aachen University, Aachen, Germany
5. Department of Neurology, Maastricht University Medical Centre, Maastricht, The Netherlands
6. Academic Centre for Epileptology, Maastricht University Medical Centre and Kempenhaeghe, Maastricht / Heeze
7. Department of Physiology, Maastricht University, Maastricht, The Netherlands

Introduction
The pathophysiology of temporal lobe epilepsy (TLE) has not been elucidated yet. Reduced functioning and integrity of the blood-brain barrier, along with microcirculatory alterations appear to play a pivotal role. What role microcirculatory changes play exactly, or if these changes hold potential therapeutic targets, has not been elucidated yet. An important barrier function is exerted by the glycocalyx, a gel-like layer coating the luminal side of the endothelium. The glycocalyx may be an important player in microcirculatory dysfunction. By examining properties of the cerebral microcirculation and its glycocalyx in vivo in TLE patients we aim to establish the missing microcirculatory link in TLE epileptogenesis.

Methods
In this prospective observational case-control study, 15 patients, aged 18 – 60 years, undergoing resective brain surgery as treatment for drug-resistant TLE are compared to 15 controls without a history of epilepsy. Measurements were acquired intraoperative with videomicroscopy using sidestream darkfield (SDF) imaging on the cerebral cortex and hippocampus. Glycocheck software was used to quantify perfused boundary region (PBR, an indirect gauge of glycocalyx), vascular density, red blood cell (RBC) velocity, and blood flow. The full study protocol has been published [Haeren, et al. BMJ Open 2017;7e013954].

Results
Cortical PBR was significantly higher in TLE patients (2.64±0.52) compared to controls (1.31±0.29), $p<0.001$, indicative of glycocalyx damage in TLE patients. Analysis of RBC velocity revealed a strong dependency between capillary and feed vessel RBC velocity in TLE patients ($R2=0.75$, $p=0.001$) but not in controls ($R2=0.36$, $p=0.088$). This indicates an impaired ability in TLE to (de-)recruit additional capillaries in changing metabolic demands and failure of neurovascular coupling mechanisms.

Conclusion
This is the first report on in vivo cerebral glycocalyx and microcirculation properties in TLE patients. Data showed that TLE patients have marked endothelial glycocalyx damage and altered cerebrovascular microcirculation, confirming our hypothesis that microcirculatory changes are important in TLE. We may consider epilepsy patients as cerebrovascular patients. Further assessment of the cerebral microcirculation in relation to epileptogenesis is necessary to increase our knowledge and may hold a promise for new therapeutic targets epilepsy.

Genomineerd voor Pélerìn Wetenschapsprijs

Prognostic implications of immediate post-thrombectomy haemorrhage on dual-energy CT

Florentina M.E. Pinckaers, MD (1,2), Magretha M.Q. Robbe, MD (1,2), Susanne G.H. Olthuis, MD (2,3), Hieronymus D. Boogaarts, MD, PhD (4), Wim H. van Zwam, MD, PhD (1,2), Robert J. van Oostenbrugge, MD, PhD (2,3), Alida A. Postma, MD, PhD (1,5)

1. Department of Radiology and Nuclear Medicine, Maastricht University Medical Centre, Maastricht, The Netherlands
2. School for Cardiovascular Diseases (CARIM), Maastricht University, Maastricht, The Netherlands
3. Department of Neurology, Maastricht University Medical Centre, Maastricht, The Netherlands
4. Department of Neurosurgery, Radboud UMC, Nijmegen, The Netherlands
5. School for Mental Health and Sciences (MHENS), Maastricht University, Maastricht, The Netherlands.

Introduction
Our aim is to describe the prevalence and prognostic relevance of immediate intracerebral haemorrhage (ICH) on dual-energy CT (DECT) after endovascular therapy (EVT) for acute ischemic stroke.

Methods
All EVT records in the MUMC+ from 2010 up to and including 2019 were screened. Included patients underwent DECT within 3 hours post-EVT. Patients with pre-EVT ICH were excluded. Virtual native reconstructions (VNC) of DECT and follow-up imaging performed until discharge were evaluated for ICH according to the Heidelberg criteria and were classified as follows: (Class 1) haemorrhagic infarction (HI)1, HI2 and parenchymal haematoma (PH)1; (Class 2) PH2; (Class 3) remote PH, intraventricular haemorrhage and subarachnoid haemorrhage. Symptomatic ICH was likewise scored according to the Heidelberg criteria. Clinical baseline and follow-up data were gathered from prospectively kept stroke records. The primary outcome measure was the modified Rankin Scale (mRS) score at 90 days; secondary outcome measures were the National Institutes of Health Stroke Scale (NIHSS) at 24-48 hours and mortality at 90 days. Conventional one-sided tests, in which each Heidelberg class was compared to patients without ICH, were performed on a single imputed dataset.

Results
Out of a total of 667 individual EVT records, 455 patients met our inclusion criteria. A total of 70 (15.4%) patients showed ICH on post-EVT DECT, of which 18 were classified as Heidelberg class 1, 5 as Heidelberg class 2, and 47 as Heidelberg class 3. All Heidelberg classes were significantly associated to the NIHSS at 24-48h (P=.003, P=.001 and P=.011, respectively). Both asymptomatic (a)ICH and symptomatic (s)ICH of Heidelberg class 1 were associated with the mRS at 90 days (P=.005 and P=.005, respectively). All ICHs in Heidelberg class 2 were symptomatic, and association to the mRS was significant (P=.001). In Heidelberg class 3, only sICH was associated with the mRS (P=.002). Considering the outcome measure mortality, only sICH of Heidelberg class 2 showed a significant association (P=.001).

Conclusion
Post-EVT ICH is a frequent finding and is associated with both short- and long-term clinical outcomes. These results may influence early clinical management post-EVT.

Genomineerd voor Pélerìn Pitch prijs

Optical coherence tomography for detection of recurrent basal cell carcinoma after non-invasive treatment of superficial basal cell carcinoma

T. Wolswijk (1,2), F. Adan (1,2), P.J. Nelemans (3), K. Mosterd (1,2)

1. Department of Dermatology, Maastricht University Medical Center+, Maastricht, The Netherlands
2. GROW Research Institute for Oncology and Reproduction, Maastricht University, Maastricht, The Netherlands
3. Department of Epidemiology, Maastricht University, Maastricht, The Netherlands

Introduction
Superficial basal cell carcinoma (sBCC) can be treated non-invasively, but follow-up may be necessary as lesions can reoccur. Still, subclinical lesions may remain unrecognized by clinical and dermoscopic examination (CDE). Optical coherence tomography (OCT), a non-invasive diagnostic tool may be able to detect subclinical recurrences. This study compared the diagnostic accuracy of OCT and CDE for detecting recurrent basal cell carcinoma (BCC) after non-invasive treatment of sBCC.

Methods
In this cross-sectional study among non-invasively treated sBCC patients, the treating physician and OCT assessor recorded their level of suspicion for BCC recurrence on a 5-point Likert-scale. Histopathological examination of punch biopsy was used to confirm or reject BCC recurrence (gold standard).

Results
A total of 100 patients were included. Histopathological data were available for 32 patients (20 with and 12 without histologicalpathologically confirmed BCC recurrence). The area under the curve (AUC) for OCT (0.888) was significantly higher than the AUC for CDE (0.667 (P=0.007). When a high suspicion of recurrence was considered a positive test result, sensitivity for detection of histopathologically verified recurrence increased from 60% for CDE to 90% for OCT (P=0.070) without compromising specificity.

Conclusion
OCT has a significantly higher ability to detect recurrent BCCs compared to CDE after non-invasive treatment of sBCCs.

Genomineerd voor Pélerìn Pitch prijs

Combined Portal and Hepatic Vein Embolization in patients with small Future Liver Remnants – Results of an interim analysis of the international multicenter DRAGON 1 trial

R. Korenblik(1,2), J. Smits(2), S. James(2), S. de Boer(3), M.H.A. Bemelmans(2,4), M. Dewulf(2,4) ,S.W.M. Olde Damink(2,4,5), C. Binkert(6), E. Schadde(7,8,9), C. van der Leij(3), R.M. van Dam(1,2,4)

1. GROW – School for Oncology and Reproduction, Maastricht University, The Netherlands
2. Department of Surgery, Maastricht University Medical Center+, The Netherlands
3. Department of Radiology, Maastricht University Medical Center+, The Netherlands
4. Department of General, Visceral and Transplantation Surgery, RTWH Aachen, Germany
5. NUTRIM – School of Nutrition and Translational Research in Metabolism, Maastricht University, The Netherlands
6. Department of Radiology, KSW Wintherthur, Switzerland
7. Department of Surgery, Hirslanden Klinik Luzern, Switzerland
8. Department of Surgery, Hirslanden Klinik Zurich, Switzerland
9. Department of Surgery, Rush University Medical Center, Chicago, United States

Introduction
Patients requiring major hepatectomies for the surgical treatment of Colorectal Cancer Liver Metastases (CRLM) and small Future Liver Remnants (FLR) often require FLR-hypertrophy inducing procedures to minimize the risk of Post Hepatectomy Liver Failure (PHLF). Portal vein embolization (PVE) is the current standard intervention to induce FLR growth. However, after PVE, only 60-70% of the patients reach a sufficient FLR-volume in time to undergo the planned resection. Combined Portal and Hepatic Vein Embolization (PVE/HVE) is a new technique which may accelerate FLR-hypertrophy. A faster and more pronounced FLR-hypertrophy could result in higher resectability rates and improved survival rates. In the DRAGON 1 trial (NCT04272931), the safety and feasibility of PVE/HVE is assessed.

Methods
The DRAGON 1-trial is a prospective international multicenter trial. All DRAGON trials collaborative centers were invited to participate in this trial. Recruitment of patients started in May 2020 and will be stopped in September 2022. Primary endpoint is the ability for each participating center to recruit 3 patients within 12 months, without any mortality due to procedure-related complications within 90 days after PVE/HVE. Secondary endpoints are resection rate, Degree of Hypertrophy, Kinetic Growth rate (KGR), complications, local and extrahepatic recurrence, and 1-year survival. To standardize procedures, work instructions are created and centers are trained in this first prospective DRAGON trial.

Results
Data from 79 patients from 43 centers were analyzed within this interim analysis. One major PVE/HVE related adverse event and 2 minor adverse events were noted. There was no procedure-related mortality. Within this group, resection rates are 96%, and the KGR within the first week after PVE/HVE was 12%. 76% of patients could undergo the planned resection within 3 weeks after PVE/HVE.

Conclusion
In this abstract we present the results of the interim analysis of the DRAGON 1 trial. In this international prospective multicenter trial, the first results of the novel HVE/PVE were analyzed. When compared to the current standard of PVE, this procedure results in a two – to threefold higher KGR of the FLR and an increase in resectability rates of 20%. Until now, no procedure-related mortalities of this new technique were noted.

Genomineerd voor Pélerìn Pitch prijs

Resistance exercise training counteracts the adverse effects of androgen deprivation therapy on body composition, muscle mass, strength and aerobic capacity in prostate cancer patients

Lisanne H.P. Houben (1,2,3,*), Maarten Overkamp (1,2,3,*), Puck van Kraaij (1,2), Jorn Trommelen (1), Joep G.H. van Roermund (1), Peter de Vries (4), Kevin de Laet (5), Saskia van der Meer (6), Ulla R. Mikkelsen (7), Lex B. Verdijk (1,3), Luc J.C. van Loon (1,3), Sandra Beijer (2,3,**), Milou Beelen (1,3,**)

1. Maastricht University Medical Centre+, Maastricht, The Netherlands
2. Netherlands Comprehensive Cancer Organisation (IKNL), Utrecht, The Netherlands
3. TiFN, Wageningen, The Netherlands
4. Zuyderland Medical Centre, Heerlen, The Netherlands
5. Máxima Medical Centre, Veldhoven, The Netherlands
6. Jeroen Bosch Hospital, 's-Hertogenbosch, The Netherlands
7. Arla Foods Ingredients Group P/S, Viby J, Denmark.

*,** these authors contributed equally to this work

Introduction

Androgen deprivation therapy (ADT) is the cornerstone in the treatment of (locally) advanced prostate cancer. However, ADT results in numerous adverse effects, including an increase in fat mass and loss of muscle mass. We hypothesized that resistance exercise training counteracts these side effects and that protein supplementation further enhances the benefits of training.

Methods

Sixty prostate cancer patients receiving ADT were randomly assigned to 20 weeks of supervised, progressive resistance exercise training (twice a week, 60 min) with supplementation of 31 g whey protein (EX+PRO, n=30) or placebo (EX+PLA, n=30), consumed immediately after exercise and every night before sleep. A separately recruited control group (CON; n=36) only received usual care. At baseline and after 20 weeks, body composition (dual-energy X-ray absorptiometry), leg muscle mass (quadriceps cross-sectional area by computed tomography), leg press strength (one-repetition maximum; 1RM), aerobic capacity (VO2peak) and habitual dietary intake (food diary) were assessed. Data were analyzed using repeated-measures ANOVA (time x treatment) followed by within-group (paired t-tests) and between-group (univariate general linear models (GLM)) analyses. For 1RM-data, the %-differences over time within groups were calculated and compared between groups with univariate GLM.

Results

For total fat and total lean mass, significant time x treatment interactions were found, with differences over time between EX+PLA and CON (fat mass: 0.4±2.2 vs 2.1±1.7 kg, respectively; P=0.002, lean mass: 0.6±2.0 vs -0.7±2.4 kg, respectively; P=0.053). Quadriceps cross-sectional area and 1RM strength increased similarly in both exercise groups (EX+PLA: 2.0±3.0 cm2 and 12±14%, respectively; EX+PRO: 1.9±2.7 cm2 and 13±11%, respectively), and these improvements were significantly different from the declines observed in the CON group (-1.2±2.5 cm2 and -5±11%, respectively; P<0.001). VO2peak decreased in EX+PRO and CON (-1.5±2.3 and -3.0±2.7 mL·min-1·kg BW-1). This decline was attenuated in EX+PLA (-0.6±2.8 mL·min-1·kg BW-1) compared to CON (P=0.003). Average habitual protein intake was >1.0 g·kg BW-1·day-1, with no changes over time or differences between groups.

Conclusion

Prolonged resistance exercise training counteracts the adverse effects of ADT on body composition, muscle mass, strength and aerobic capacity, with no additional benefits of protein supplementation in prostate cancer patients habitually consuming ample amounts of protein.

Genomineerd voor Pélerìn Pitch prijs

Association of type 2 diabetes, according to the number of risk factors within target range, with incident dementia and incident major depressive disorder

April C.E. van Gennip (1, 2), Coen D.A. Stehouwer (1, 2), Abraham A. Kroon (1, 2), Sebastian Köhler (3, 4), Annemarie Koster (5, 6), Simone J.P.M. Eussen (2, 5, 7), Bastiaan E. de Galan (1, 2, 8), Miranda T. Schram (1, 2, 4, 9), Thomas T. van Sloten (1, 2)

1. Department of Internal Medicine, Maastricht University Medical Centre+, the Netherlands
2. School for Cardiovascular Diseases CARIM, Maastricht University, the Netherlands
3. Department of Psychiatry and Neuropsychology, Maastricht University Medical Centre+, the Netherlands
4. School for Mental Health and Neuroscience MHENS, Maastricht University, the Netherlands
5. Care and Public Health Research Institute CAPHRI, Maastricht University, the Netherlands
6. Department of Social Medicine, Maastricht University, the Netherlands
7. Department of Epidemiology, Maastricht University Medical Centre+, the Netherlands
8. Department of Internal Medicine, Radboud University Medical Centre, the Netherlands
9. Heart and Vascular Centre, Maastricht University Medical Centre+, the Netherlands

Introduction
Type 2 diabetes is associated with increased risks of dementia and major depressive disorder. The extent to which risk factor modification can mitigate these excess risks is unclear. We investigated the associations between incident dementia and depression among individuals with type 2 diabetes, according to the number of risk factors on target, compared to controls without diabetes.

Methods
Prospective data from UK Biobank of 87,856 individuals (n=10,663 type 2 diabetes/n=77,193 controls; baseline 2006-2010; follow-up for dementia and depression until 2018 and 2022, respectively). Analysis was replicated in the Maastricht Study (cohort with oversampling of type 2 diabetes; baseline 2010-2017; data available on incident clinically relevant depressive symptoms only (PHQ-9 score ≥10), assessed annually until 2017). Individuals with type 2 diabetes were categorized according to the number of seven selected risk factors on target (nonsmoking; guideline-recommended levels of glycated hemoglobin, blood pressure, BMI, albuminuria, physical activity and diet).

Results
Mean follow-up for dementia and depression was 9.0 and 12.1 years, respectively. The incidence rates per 1,000 person-years for dementia and depression were 1.19 (95%CI,1.00; 1.38) and 4.88 (4.44; 5.31) among individuals with type 2 diabetes, and 0.62 (0.56; 0.68) and 3.04 (2.92; 3.16) among controls, respectively. Compared to controls, individuals with type 2 diabetes had a higher incidence of dementia (HR: 1.88 (1.55; 2.27)) and depression (1.61 (1.46; 1.77)). Among individuals with type 2 diabetes, excess risk of dementia and depression decreased stepwise for a higher number of risk factors on target. Among individuals with type 2 diabetes who had 5 to 7 risk factors on target, compared to controls, the HR for dementia was 1.32 (0.89; 1.95) and 1.34 (1.13; 1.58) for depression. Similarly, in The Maastricht Study, risk of depressive symptoms decreased stepwise for a higher number of risk factors on target; individuals with type 2 diabetes in that study who had 5 to 7 risk factors on target had no excess risk of depressive symptoms (HR 1.03 (0.63; 1.68)).

Conclusion
Among individuals with type 2 diabetes, risk of dementia and major depressive disorder decreased stepwise for a higher number of risk factors on target.

Genomineerd voor Pélerìn Pitch prijs

Identifying phenotypes of deep vein thrombosis and their relation to clinical outcomes beyond recurrence

Iding AFJ (1,2), Pallares Robles A (1,3), ten Cate V (3), ten Cate H (1-3), Wild PS (3), ten Cate-Hoek AJ (1,2)

1. Department of Biochemistry, Cardiovascular Research Institute Maastricht (CARIM), Maastricht University, Maastricht, the Netherlands
2. Thrombosis Expertise Center, Heart+Vascular Center, Maastricht University Medical Center (MUMC), Maastricht, the Netherlands
3. Clinical Epidemiology and Systems Medicine, Center for Thrombosis and Hemostasis (CTH), Mainz, Germany

IIntroduction
Deep vein thrombosis (DVT) is a multifactorial disease with multiple clinical outcomes, but current classifications are based on few factors and solely stratify recurrence risk. We aimed to identify DVT phenotypes and assess their relation to recurrent venous thromboembolism (VTE), post-thrombotic syndrome, arterial events, and cancer.

Methods
Hierarchical clustering was performed on a single-center cohort of patients with proximal DVT using 23 prospectively recorded characteristics (i.e., demographics, provoking factors, cardiovascular risk factors and comorbidities). Phenotypes were summarized by their discriminative characteristics, which were significantly different (p-value <0.05) compared to all other phenotypes. Hazard ratios (HR) were calculated by time-to-event analyses using cox proportional hazards regression; recurrence risk was adjusted for duration of anticoagulant therapy. Follow-up duration was up to five years. The study was carried out in accordance with the Declaration of Helsinki and the medical ethics committee approved data collection.

Results
A total of 825 patients were clustered into separate groups: (1, n=112) younger females with estrogen therapy; (2, n=268) patients with cardiovascular risk factors; (3, n=128) patients with previous VTE and known thrombophilia; and (4, n=317) patients without discriminative characteristics. Overall, risks of recurrent VTE, post-thrombotic syndrome, arterial events, and cancer were low in phenotype 1 (reference), intermediate in phenotype 4 (HR 4.5, 1.2, 2.2, 3.2), and high in phenotypes 3 (HR 5.7, 2.5, 2.3, 5.4) and 2 (HR 6.1, 1.6, 4.5, 6.0). Notably, phenotype 1 largely overlapped with current classifications of provoked DVT, while phenotypes 2, 3 and 4 harboured different proportions of unprovoked DVT.

Conclusion
Hierarchical clustering identified four distinct phenotypes among DVT patients, which were not only associated with increasing risk for recurrent VTE but also with outcomes beyond recurrence. Our results thereby highlight the limitations of current risk stratifications that dichotomize risks based on VTE provoking factors only. Interestingly, females were found to have the lowest risk for outcomes, while patients with a cardiovascular risk profile were identified as being at the highest risk of recurrence and arterial events. This holistic approach should be considered in future risk models for outcomes of DVT patients.

Genomineerd voor Pélerìn Pitch prijs

Total breast reconstruction with autologous fat transfer vs. implants (The BREAST- trial): A randomized clinical trial

A. Piatkowski, M.D., Ph.D. (1,2,3) , **Jamilla L.M. Wederfoort**, M.D. (1,2), Juliette E. Hommes, M.D., Ph.D. (1,2), Sander J. Schop, M.D. (1,2), Todor K. Krastev, M.D., Ph.D. (1), Sander M.J. van Kuijk, Ph.D. (4), René R.W.J. van der Hulst, M.D., Ph.D. (1,2), M.D for The BREAST- trial investigators

1 Department of Plastic-, Reconstructive-, and Hand Surgery, Maastricht University Medical Center+, Maastricht, the Netherlands
2 NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University, Maastricht, the Netherlands
3 Department of Plastic-, Reconstructive-, and Hand Surgery, Viecuri Medical Center, Venlo, the Netherlands
4 Department of Clinical Epidemiology and Medical Technology Assessment (KEMTA), Maastricht University Medical Center, Maastricht, The Netherlands

Introduction
Contemporary techniques for breast reconstruction are implant-based reconstruction (IBR) and reconstruction using autologous free tissue flaps. This study investigates a third autologous, yet less invasive technique: autologous fat transfer (AFT). It was compared to the gold-standard IBR. Currently, there is insufficient evidence that AFT is safe and effective.

Methods
This trial was performed in seven hospitals across the Netherlands. Breast cancer patients opting for breast reconstruction were included. Randomization to AFT or IBR was done in a 1:1 ratio. Primary outcome measure was quality of life (QoL), measured by the BREAST-Q questionnaire, at 12 months after final surgery.

Results
A total of 193 patients were included in this study (93 AFT, 98 IBR). Of these, 64 women in the AFT group and 68 women in the IBR group completed the 12-months postoperative BREAST-Q. Main BREAST-Q scores were higher in the AFT group in three of five domains; satisfaction with breasts, physical well-being and satisfaction with outcome. Linear mixed-effects regression analysis showed QoL change over time was dependent on treatment group, in favor of AFT. Average volume achieved was 300.3ml in the AFT group vs. 384.1ml in the IBR group. No differences in oncologic events were found (4 AFT, 5 IBR).

Conclusion
These findings corresponded to higher QoL and an increase in QoL scores over time in the AFT group compared to the IBR group. No evidence was found that AFT is unsafe. This is encouraging news since it provides a third reconstruction option for breast cancer patients.

Genomineerd voor Pélerìn Pitch prijs

Evaluation of Rectum Spacer for high risk on rectal toxicity Prostate cancer patients treated with External beam Radiotherapy

Cobussen, A, M.D.(1) van Limbergen, E, M.D. PhD.(1) Lutgens, L, M.D. PhD, (1) Marcelissen, T, M.D. PhD.(2) Vanneste B, M.D. PhD.(1)

1 Maastro
2 MUMC

Introduction
Anorectal toxicity is an important complication of external beam radiotherapy (EBRT) in prostate cancer patients. In patients with specific high risk factors on rectal toxicity (e.g. inflammatory bowel disease (IBD) or use of anticoagulants), the incidence on grade 3 or more gastrointestinal (GI) toxicity increases extensively: in the literature this is described as 15 to 30%. In these high risk patients, rectum spacers can limit rectal dosimetry which consequently decreases the GI toxicity to an acceptable level without compromising in tumor dose. This efficacy study is an evaluation of the GI toxicity in high risk on rectal toxicity patients with prostate cancer undergoing EBRT with a rectum spacer.

Methods
High risk on rectal toxicity patients (IBD, use of anticoagulants, systemic disease with proctitis, previous pelvic surgery or radiotherapy or prediction of >5% risk reduction on grade ≥2 toxicity) undergoing rectal balloon implant (RBI) and EBRT between march 2016 and august 2021 were eligible. Dose statistics, toxicity rates and spacing distance were collected from electronic patient files. Patients were treated with EBRT (70 Gray (Gy) in 28 fractions). Toxicity rates were scored prospectively according to the CTCAE, version 4.03. Acute toxicity occurred during and up to 3 months after the treatment and late toxicity was defined as toxicity occurring ≥ 3 months after treatment.

Results
A total of 43 patients received RBI and EBRT. Median spread of the spacer measured mid-prostate was 20.0 mm. A median Dmean rectum and anal canal of 18.5 Gy and 7.4 Gy was observed, respectively. A median anorectal D2cc revealed of 56.9Gy. With a median FU of 13months, no grade ≥3 GI or genitourinary (GU) toxicity was observed. Grade 2 acute GI toxicity was detected in 3/43 patients and only 2 patients experienced late grade 2 toxicity, which was resolved completely 12 and 18 months after treatment.

Conclusion
This is the first cohort of high risk on rectal toxicity patients treated with EBRT in combination with a RBI: it seems a safe and effective solution to limit anorectal toxicity in these patients, however further prospective clinical trials are required to confirm this hypothesis.

Genomineerd voor Pélerìn semi-arts prijs

The role of specific gut bacteria in metastatic colorectal cancer treatment

Bob Bindels 2, Janine Ziemons 1,2, Lars Hillege 1,2, Romy Aarnoutse 1,2, Judith de Vos-Geelen 1,3, Liselot Valkenburg-van Iersel 1,3, Geert-Jan M. Creemers 4, Arnold Baars 5, Hanneke J.H.M.J. Vestjens 6, John Penders 7,8 & Marjolein L. Smidt 1,2

1 GROW - School for Oncology and Developmental Biology, Maastricht University, Maastricht, the Netherlands
2 Department of Surgery, Maastricht University Medical Centre, Maastricht, the Netherlands
3 Department of Internal Medicine, Division of Medical Oncology, Maastricht University Medical Centre, Maastricht, the Netherlands
4 Department of Medical Oncology, Catharina Hospital, Eindhoven, the Netherlands
5 Department of Medical Oncology, Hospital Gelderse Vallei, Ede, the Netherlands
6 Department of Internal Medicine, VieCuri Medical Centre, Venlo, the Netherlands
7 Department of Medical Microbiology, Maastricht University Medical Centre, Maastricht, the Netherlands
8 NUTRIM - School of Nutrition and Translational research In Metabolism, Maastricht University, Maastricht, the Netherlands

Introduction
Metastatic colorectal cancer (mCRC) is commonly treated with palliative chemotherapy, e.g. with capecitabine. Not all tumors respond well to chemotherapy. It is still not completely understood what causes this lack of therapy response. Previous studies have shown that some bacteria of the human intestine microbiome play a role in CRC development and prognosis, for example Fusobacterium nucleatum, Bacteroides fragilis and Akkermansia muciniphila. By further exploring the composition of the microbiome before, during, and after treatment with chemotherapy in mCRC patients, new insight into the association between the gut microbiota profile and tumor response could be investigated. This pilot study aimed to explore whether there is an association between abundance of specific gut bacteria (Fusobacterium, Bacteroides and Akkermansia), response to three cycles of systemic treatment with capecitabine and chemotoxicity in mCRC patients.

Methods
mCRC patients treated with capecitabine were asked to collect a fecal sample and to fill in a questionnaire before, during, and after three treatment cycles. CT or MRI was used to monitor the response to the systemic treatment. Tumor response was reported in percentage tumor change and the RECIST-criteria. The Common Terminology Criteria for Adverse Events (CTCAE) and Karnofsky-score were used to grade chemotoxicity. To investigate the microbiome composition, microbiological analysis of the fecal samples was performed utilizing 16S rRNA gene sequencing on the MiSeq platform.

Results
In total, 32 patients were included. 81.3% (n=26) of the participants had stable disease, 3.1% (n=1) progressive disease and 15.6% (n=5) partial response after three treatment cycles. The mean percentage tumor size change was -13.4%. No significant correlation was found between Fusobacterium, Bacteroides or Akkermansia abundance and response to three cycles of chemotherapy with capecitabine in mCRC patients. Significant correlations were found between specific bacteria abundance and the following adverse effects: a lower Karnofsky-score, alopecia, constipation, diarrhea and fatigue.

Conclusion
In this study population, a higher abundance of Fusobacterium, Bacteroides or Akkermansia was not associated with a more limited response to chemotherapy with capecitabine. Multiple significant correlations were found between chemotoxicity and bacteria abundance. However, more large-scale research is required to further clarify the role of these bacteria in mCRC.

Genomineerd voor Pélerìn semi-arts prijs

The potential response of DCIS in HER2-positive IBC patients: a nationwide retrospective study

E.L. Claassens 1, R.A.W. Ploumen 1 ,2, L.F.S. Kooreman 2, 3, T.J.A. van Nijnatten 2, 4 & M.L. Smidt 1, 2

1 Department of Surgery, Maastricht University Medical Centre, Maastricht, the Netherlands
2 GROW - School for Oncology and Developmental Biology, Maastricht University, Maastricht, the Netherlands
3 Department of Pathology, Maastricht University Medical Centre, Maastricht, the Netherlands
4 Department of Radiology and Nuclear Medicine, Maastricht University Medical Centre, Maastricht, the Netherlands

Introduction
Neo-adjuvant systemic therapy (NST) is increasingly applied in breast cancer to increase breast-conserving surgery (BCS) rates and to improve oncological outcomes. Ductal carcinoma in situ (DCIS) is present adjacent to invasive breast cancer (IBC) in 64.1% of HER2-positive breast cancer patients. DCIS was previously considered to be insensitive to NST. Consequently, mastectomy rates are higher in patients with a DCIS component. Recent studies have shown that DCIS can be sensitive to NST, however, only small populations were investigated. Therefore, the aim of this study was to determine the response of DCIS in a nationwide cohort and to assess the potential influence of clinicopathological variables.

Methods
All women aged 18 or older, diagnosed with HER2-positive IBC, treated with NST and surgery between January 2010 and December 2019, were selected from the Netherlands Cancer Registry (NCR). From PALGA, the Dutch network and registry of histo- and cytopathology, all pre-NST biopsy and postoperative specimen pathology reports were obtained to determine the presence of DCIS and pathological characteristics including comedonecrosis and calcifications. Response of DCIS was defined as absence of DCIS in postoperative pathology when a DCIS component was present in the pre-NST biopsy. Clinicopathological factors associated with DCIS response were assessed using logistic regression analyses.

Results
In total, 5834 patients were included, of which 1443 (24.7%) had a DCIS component in the pre-NST biopsy. Of these 1443 patients, 51.5% showed complete response of the DCIS component. Response of DCIS was significantly more frequent in patients without comedonecrosis ($p = 0.026$) and/or microcalcifications ($p < 0.001$) in the pre-NST biopsy. Multivariable logistic regression analysis showed ER negative IBC (OR 1.80; 95% CI 1.33 – 2.42) and NST containing chemotherapy with HER2 targeted therapy (OR 5.97; 95% CI 1.82 – 19.55) to be independently associated with response of DCIS.

Conclusion
More than half of HER2-positive IBC patients with adjacent DCIS showed a complete response of the DCIS component to NST. ER negativity and treatment with HER2 targeted therapy were independently associated with higher odds for DCIS response. Therefore, future studies on surgical treatment after NST should consider DCIS response in HER2-positive IBC.

Genomineerd voor Pélerìn semi-arts prijs

Magnetic Resonance Imaging halfway through and after concurrent versus sequential neoadjuvant antracyclin-taxane containing chemotherapy regimen in triple negative breast cancer: a retrospective, observational study.

I.J.M. Corver, 1

1. Department of Internal Medicine, Division of Medical Oncology, Maastricht University Medical Centre, Maastricht, the Netherlands

Introduction
Magnetic resonance imaging (MRI) halfway through neoadjuvant chemotherapy (NAC) can predict pathological complete response (pCR) in breast cancer. Taxane containing chemotherapy decreases contrast enhancement on MRI examination, resulting in overestimation of response to chemotherapy. The primary goal of this study was to evaluate the predictive value of radiological complete response (rCR) halfway through and after concurrent versus sequential antracyclin-taxane containing NAC regimen for pCR in patients with triple negative breast cancer (TNBC). The secondary goal was to assess the association of MRI-based response patterns halfway through and after concurrent versus sequential NAC and pCR.

Methods
Patients with TNBC who were treated with concurrent or sequential antracyclin-taxane containing NAC regimen between 2009 and 2020, who underwent breast MRI before, halfway through and optionally after neoadjuvant treatment and who underwent surgery in Maastricht University Medical Centre+ (MUMC+) were included. Complete radiological response (type 0) was defined as disappearance of tumor on MRI. Pathological complete response was defined as EUSOMA 1i. For the primary goal, the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated. The association between different MRI-based response patterns and pathological outcome was described for the secondary study goal.

Results
A total of 72 patients with 75 triple negative breast tumors were included. MRI halfway through concurrent or sequential NAC showed a PPV of 0.75 (95%-CI 0.27-0.96) and 0.88 (95%-CI 0.49-0.98). The MRI after concurrent or sequential NAC had a PPV of 1.0 and 0.73 (95%-CI 0.52-0.87). Most patients with pCR showed a rCR (38.5%) or a shrinkage pattern (57.7%) on MRI halfway through NAC. Also on MRI after NAC, most patients with pCR showed rCR (60.9%) or a shrinkage pattern (34.9%).

Conclusion
The predictive value of rCR halfway through and after NAC for pCR was high, and not statistically different, in both concurrently and sequentially treated patients. Most patients with pCR showed a rCR or shrinkage pattern on MRI halfway through or after concurrent or sequential NAC.

Genomineerd voor Pélerìn semi-arts prijs

Surgical management of patients requiring a cholecystectomy during COVID-19: ChoCO-VID study

Fenja de Ruijter (1) Joop Konsten (2) Nicole Bouvy (3) Frits Van Osch (4) Isis Ensink (5)

1. Department of Surgery

Introduction
During the COVID-19 pandemic the number of surgeries has decreased among Dutch hospitals in order to reorganize hospitalized care. The aim of this study is to determine whether the pandemic caused alterations in patient management, post-surgical outcomes in terms of complications and readmissions within 30 days during the pandemic in patients requiring a cholecystectomy.

Methods
A multicenter retrospective cohort study was performed including patients who underwent a cholecystectomy in both Maastricht University Medical Hospital (MUMC+) and VieCuri Hospital during a control period (27th February 2019 to 26th February 2020) and during the first year of the COVID-19 pandemic (27th February 2020 to 26th February 2021). Patients' characteristics, surgical procedures and post-surgical events were obtained from electronic patient files.

Results
A total of 962 patients who underwent a cholecystectomy were included, of which 425 patients required a cholecystectomy during the pandemic. For patients diagnosed with cholelithiasis the waiting time to surgery did not differ between the pre-pandemic and COVID-cohort. However, the waiting time for patients with acute cholecystitis was 0.3 days during the pandemic as compared to 7.5 days pre-pandemic ($P<0.05$). The number of patients who received percutaneous gallbladder drainage was significantly higher in the control group ($P<0.05$). Additionally, the post-surgical complication rate was higher in the control group as well ($P<0.05$). There was no difference in mean length of hospital stay between two cohorts in patients diagnosed with cholecystolithiasis. However, patients with cholecystitis had a mean length of stay of 4 days pre-pandemic, as compared to 2.5 days during COVID. The 30-day readmission rate did not differ.

Conclusion
During the pandemic surgeons performed less cholecystectomies. Specifically in patients with acute cholecystitis the indication-operation time was significantly shorter during the pandemic, and surgery was less often preceded by percutaneous drainage of the gallbladder. It may be because of the abbreviated indication-operation time that the complication-rate during the pandemic was lower as compared to previous year.

Genomineerd voor Pélerìn semi-arts prijs

Validation of the Dutch version of the Swallowing Outcomes After Laryngectomy questionnaire.

J.P.S.M. Dolmans (1,2), W. Pilz (2,3,4), B. Winkens (5,6), M.A. van Beers (7), R. de Bree (7), L. van der Molen (8), L.W.J. Baijens (2,3)

1 FHML, Universiteit Maastricht
2 Vakgroep KNO, Maastricht UMC+
3 GROW-School for Oncology and Reproduction, Universiteit Maastricht
4 MHeNs-School for Mental Health and Neuroscience, Universiteit Maastricht
5 Vakgroep Methodologie en Statistiek, Universiteit Maastricht
6 CAPHRI-Care and Public Health Research Institute, Universiteit Maastricht
7 Vakgroep KNO, UMC Utrecht; 8 Antoni van Leeuwenhoek.

IIntroduction
The Swallowing Outcomes After Laryngectomy (SOAL) questionnaire is a self-report dysphagia-specific symptom burden questionnaire specifically developed for patients who underwent a total laryngectomy (TLE). Currently, there is no disease-specific dysphagia tool to measure the dysphagia-specific symptom burden of Dutch TLE patients. The hypothesis of this study is that the Dutch translation of the SOAL questionnaire is valid to measure dysphagia-specific symptom burden in Dutch TLE patients.

Methods
The English version of the SOAL questionnaire was translated according to the 'consensus-based standards for the selection of health measurement instruments' (COSMIN) method. The SOAL questionnaire was administered at two time points with an interval of two weeks, using a standardized protocol. Construct validity (principal component analysis and known-groups validity), data quality, internal consistency, and test-retest reliability were determined. The first and retest measurements with the SOAL questionnaire were completed by telephone, by post or by email. All patients underwent a TLE in the Maastricht University Medical Center+ (MUMC+) between 2008 and 2020.

Results
Forty patients were enrolled in this study ('main sample'), of which 31 patients had no history of a concurrent neurological diagnosis ('the subgroup'). The first and retest measurements were analysed separately for the main sample and the subgroup. The principal component analysis showed a discriminative dimensionality of the SOAL questionnaire and the known-groups validity distinguished patients based on their diets ($t(29.3) = -4.137$, $p < .001$; $t(19.4) = -3.215$, $p = .002$; main sample and subgroup, respectively). The SOAL questionnaire showed good quality of data (no ceiling effect; minimal to moderate floor effect (12 – 29%)), an excellent internal consistency (Cronbach's $\alpha = 0.907 – 0.920$), and an excellent test-retest reliability (intraclass correlation coefficient = 0.97 - 0.98).

Conclusion
The Dutch version of the SOAL questionnaire is a valid and reliable questionnaire to be used during the consultation hours for measuring dysphagia-specific symptom burden in Dutch TLE patients.

Genomineerd voor Pélerìn semi-arts prijs

Moral distress and ethical climate in intensive care medicine during COVID-19: a nationwide study

Moniek A. Donkers (1), Vincent J. H. S. Gilissen (1), Math J. J. M. Candel (2), Nathalie M. van Dijk (1), Hans Kling (3), Ruth Heijnen-Panis (1), Elien Pragt (1), Iwan van der Horst (1), Sebastiaan A. Pronk (1) & Walther N. K. A. van Mook (1,4,5)

1. Department of Intensive Care, Maastricht University Medical Center+, Maastricht, the Netherlands;
2. Department of Methodology and Statistics, Care and Public Health Research Institute (CAPHRI), Maastricht University, the Netherlands
3. Department of Spiritual Care Services, Maastricht University Medical Center+, Maastricht, the Netherlands;
4. Academy for Postgraduate Medical Training, Maastricht University Medical Center+, Maastricht, the Netherlands;
5. School of Health Professions Education, Maastricht University, Maastricht, the Netherlands

Introduction
The COVID-19 pandemic has created ethical challenges for intensive care unit (ICU) professionals, potentially causing moral distress. This study explored the levels and causes of moral distress and the ethical climate in Dutch ICUs during COVID-19.

Methods
An extended version of the Measurement of Moral Distress for Healthcare Professionals (MMD-HP) and Ethical Decision Making Climate Questionnaire (EDMCQ) were online distributed among all 84 ICUs. Moral distress scores in nurses and intensivists were compared with the historical control group one year before COVID-19.

Results
Three hundred forty-five nurses (70.7%), 40 intensivists (8.2%), and 103 supporting staff (21.1%) completed the survey. Moral distress levels were higher for nurses than supporting staff. Moral distress levels in intensivists did not differ significantly from those of nurses and supporting staff. "Inadequate emotional support for patients and their families" was the highest-ranked cause of moral distress for all groups of professionals. Of all factors, all professions rated the ethical climate most positively regarding the culture of mutual respect, trust and support. "Culture of not avoiding end-of-life-decisions" and "Self-reflective and empowering leadership" received the lowest mean scores. Moral distress scores during COVID-19 were significantly lower for ICU nurses ($p<0.001$) and intensivists ($p<0.05$) compared to one year prior.

Conclusion
Levels and causes of moral distress vary between ICU professionals and differ from the historical control group. Targeted interventions that address moral distress during a crisis are desirable to improve the mental health and retention of ICU professionals and the quality of patient care.

Genomineerd voor Pélerìn semi-arts prijs

The effect of aspiration vs stent retriever on the occurrence of postprocedural intracranial hemorrhage during endovascular therapy in ischemic stroke

Thibaut F.M. Guffens, Florentina M.E. Pinckaers, MD (1,2), Julie E.A. Staals, MD, PhD (2,3), Robert E.A. van Oostenbrugge, MD, PhD (2,3), Wim H. van Zwam, MD, PhD (1,2), Alida A. Postma, MD, PhD (1,4)

1. Department of radiology and Nuclear Medicine, Maastricht University Medical centre, Maastricht, The Netherlands
2. School for Cardiovascular Diseases (CARIM), Maastricht University, Maastricht, The Netherlands
3. Department of Neurology, Maastricht University Medical Centre, Maastricht, The Netherlands
4. School for Mental Health and Sciences (MHENS), Maastricht University, Maastricht, The Netherlands

Introduction
The use of stent retriever (SR) in endovascular therapy (EVT) during acute ischemic stroke (AIS) has been associated with improved cloth retrieval and revascularization in comparison with contact aspiration (CA) only techniques. However, it has been suggested that the use of SR is associated with more vessel wall damage. We aim to determine whether there is a difference between SR and CA only in the occurrence of intracranial hemorrhage (ICH) on immediate post-EVT dual-energy CT (DECT).

Methods
EVT records from 2010 up to and including 2019 were screened. The main inclusion criterion was a DECT within 3 hours post-EVT. Exclusion criteria included the presence of ICH before EVT, as well as solitary ICH post-EVT remote from infarct location. Records without retrieval attempts were excluded. ICH was scored using the Heidelberg criteria. Clinical data were derived from prospective stroke records and patients were categorized into SR or CA only. The primary outcome measure was immediate post-EVT ICH on DECT. Secondary outcome measures were intraparenchymal ICH, extraparenchymal ICH, and symptomatic ICH (sICH). Data was analyzed using multivariable logistic regression with adjustments based on univariate analyses and literature review.

Results
Out of 667 individual EVT records, 421 were included in our statistical analysis. ICH was found in 64 patients (15%), of which 21 patients showed intraparenchymal (32%) and 52 showed extraparenchymal ICH (81%). sICH was found in 14/421 patients (3%).
Unadjusted logistic regression analysis showed a significant association between SR and ICH (OR: 3.46, 95%CI: 1.34-8.94), and between SR and extraparenchymal ICH (OR: 3.43, 95%CI: 1.20-9.82). However, these results were no longer significant in multivariable logistic regression (adjusted (a)OR: 2.37, 95%CI: 0.86-6.54 and aOR: 2.11, 95%CI: 0.71-6.33, respectively). No significant difference was found between SR and CA only in the occurrence of intraparenchymal ICH (aOR: 2.31, 95%CI: 0.52-10.22) or in the occurrence of sICH (aOR: 0.42, 95%CI: 0.10-1.85).

Conclusion
The use of stent retriever was not associated with a higher incidence of immediate post-EVT ICH, nor with the occurrence of intraparenchymal, extraparenchymal or symptomatic ICH.

Genomineerd voor Pélerìn semi-arts prijs

Optimal target volume delineation in thymomas: A comparison between surgeons and radiation oncologists.

Kato Herman (1), Monique Hochstenbag (2), Florit Marcuse (2), Dirk De Ruysscher (3), Stephanie Peeters (3)

1. Department of Radiotherapy, MUMC
2. Department of Pulmonology, MUMC
3. Maastro

Introduction
High-risk thymomas are surgically resected and treated with post-operative radiotherapy (PORT). Accurate target volume delineation (TVD) remains challenging in PORT due to its susceptibility to human error, as radiation oncologists must subjectively interpret reports and imaging. Suboptimal TVD increases risk of toxicity and/or recurrence. Cardiothoracic surgeons gather valuable first-hand information about anatomical changes and areas "at risk" during thymectomies; however, they are rarely consulted during TVD. This multicentre study aimed to examine interphysician variability among radiation oncologists and surgeons in clinical target volume (CTV) delineation of benign thymomas. Our hypothesis that specialists approach TVD differently was central to this study.

Methods
Imaging and clinical characteristics of thirty-one patients, who underwent a thymectomy and PORT, were retrospectively acquired. Five hospitals each appointed a radiation oncologist and a surgeon to first independently, and afterwards collaboratively, delineate the CTV on planning computed tomography scans. Volumes, Hausdorff distances (HD) and Dice similarity coefficients (DSC) analyzed volumetric and spatial relations and overlap between contours, respectively. A paired t-test or Wilcoxon-signed rank test compared volumetric differences between all groups.

Results
A significant difference in median CTV was reported between radiation oncologists and surgeons (78.31 versus 47.62 cm3, p=0.003). Agreement was poor between specialists, with a low median DSC of 0.37 and considerable HD (median, 4.46 cm). Collaborative delineation also resulted in significantly smaller volumes (median, 38.56 cm3) compared to radiation oncologists (p=0.000), yet not surgeons (p=0.610). Overlap was moderate between joint delineations and either specialist. However, median HDs of 3.17 cm and 3.64 cm indicated that joint delineations were located closer to contours of surgeons compared to radiation oncologists, respectively.

Conclusion
This exploratory study demonstrated that significant interphysician variability exists in TVD of thymomas. Collaborative delineation prompted notable revisions in TVD in favor of the surgeons' judgement, suggesting that surgeons provided relevant insight into other areas "at risk". A multidisciplinary approach to PORT for thymomas is thus recommended in routine clinical practice. Further research is required to establish its therapeutic benefit.

Genomineerd voor Pélerìn semi-arts prijs

Angiotensin receptor blockers are equally effective in women and men; a systematic review and meta-analysis

Sophie A. J. S. Laven (1), BSc, Zenab Mohseni-Alsalhi (1), BSc, Daniek A. M. Meijs (), BSc, Esmee W. P. Vaes (1), BSc, Nick Wilmes (1), BSc, Eveline M. van Luik (1), BSc, Maud A. M. Vesseur (1), BSc, Sander de Haas (1), MSc MD, Marc E. A. Spaanderman (1,2), MD PhD, Chahinda Ghossein-Doha (1,3), MD PhD

(1) Department of Obstetrics and Gynecology, Maastricht University Medical Center (MUMC+), the Netherlands
(2) Department of Obstetrics and Gynecology, Radboud University Medical Center, the Netherlands
(3) Department of Cardiology, Maastricht University Medical Center (MUMC+), the Netherlands

Introduction
Hypertension is the leading risk factor for cardiovascular disease and the most substantial and neglected health burden in women. While treatment of high blood pressure is essential in global prevention strategies of CVD, it is assumed that effectiveness of pharmacological treatment may be hampered by sex differences. However, it is still unknown whether sex differences exist in the effect of the antihypertensive medication.
Purpose: To evaluate sex-stratified effects for angiotensin receptor blockers (ARBs) on blood pressure (BP) and cardiac function in female compared to male hypertensive participants.

Methods
A series of systematic reviews and meta-analysis was performed. PubMed and EMBASE were systematically searched for studies evaluating the effects of the five major groups of antihypertensive medication from 1945 to May 2020. Randomized controlled trials and observational studies in humans were included investigating ARBs, beta-blockers, angiotensin-converting enzyme inhibitors, calcium channel blockers, and diuretics. In this study data on ARBs was analyzed. Studies had to present both baseline and follow-up measurements of at least one of the outcome variables of interest and present their data sex-stratified. Data on BP and cardiac function where retrieved from studies. Risk of bias was assessed using the Cochrane risk of bias tool.

Results
The search strategy resulted in 73,867 hits. After screening based on title and abstract, and excluding studies that matched the exclusion criteria, 205 studies with 15,570 participants where eligible for analysis for the five antihypertensive drugs. Studies investigating ARBs (n=17) where used in this review. Seven trials (41%) had a low risk of bias. ARBs decreased BP significantly and comparably in both women and men. Systolic BP -18.2 mmHg (95% CI, -24.8 to -11.5) vs -20.1 mmHg (95% CI, -26.7 to -13.6) and diastolic BP -11.6 mmHg (95% CI, -14.7 to -8.4) vs -12.3 mmHg (95% CI, -16.4 to -8.1). LVEF did not change significantly in either group. LV mass was only reported in males and did not change significantly -11.8 g (95% CI, -25.6 to 1.9).

Conclusion
Our meta-analysis shows that based on the current studies, no sex differences exists in the effect of ARBs on blood pressure or cardiac function.

Genomineerd voor Pélerìn semi-arts prijs

Right versus left laparoscopic hemihepatectomy and right open versus right laparoscopic hemihepatectomy within the Randomized ORANGE-II-PLUS trial

Bram Olij (1,15), **Gabriela Pilz da Cunha** (1), , Luca A. Aldrighetti (2), Roberto I. Troisi (3), Mohammed Abu Hilal (4), Robert P. Suttcliffe (5), Marc G.H. Besselink (6), Somaiah Aroori (7), Krishna V. Menon (8), Bjørn E.Edwin (9), Mathieu D'Hondt (10), Valerio Lucidi (11), Tom F. Ulmer (12), Rafael Diaz-Nieto (13), Francesca Ratti (2), Robert S. Fichtinger (1,15), Christoph Kümmerli (4,14), Lloyd Brandts (1), Siân A. Pugh (4), Zina Eminton (4,14), John Neil Primrose (4,14), Ronald M. Van Dam (1, 12, 15), ORANGE II PLUS Collaborative

1. Maastricht University Medical Center+, Maastricht, Netherlands;
2. IRCCS San Raffaele Hospital, Milan,Italy;
3. Ghent University Hospital, Ghent, Belgium;
4. University Hospital Southampton NHS Foundation Trust, Southampton, United Kingdom;
5. University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom;
6. Amsterdam University Medical Centers, University of Amsterdam, Amsterdam, Netherlands;
7. University Hospitals Plymouth NHS Foundation Trust, Plymouth, United Kingdom;
8. King's College Hospital NHS Foundation Trust, London, United Kingdom;
9. Oslo University Hospital, Oslo, Norway;
10. Groeninge Hospital, Kortrijk, Belgium;
11. Erasme Hospital, Brussels, Belgium;
12. University Hospital RWTH Aachen, Aachen, Germany;
13. Aintree University Hospital NHS Foundation Trust, Liverpool, United Kingdom;
14. Southampton Clinical Trials Unit, Southampton, United Kingdom;
15. Maastricht University Medical Center, GROW School for Oncology & Developmental Biology, Maastricht University, Maastricht, Netherlands

Introduction
Right hemihepatectomy (RH) is perceived as more technically challenging than left hemihepatectomy (LH). Despite abundant evidence favouring minimally invasive over open surgery for major liver resections, there is hesitance in the widespread adoption of laparoscopic RH. There is limited data specifically assessing clinical outcomes of laparoscopic RH compared with laparoscopic LH. Additionally, the assumed advantages of laparoscopic RH over open RH have not been examined extensively yet. The aim of the current study is to compare operative and postoperative outcomes of LH and RH within the ORANGE-II-PLUS randomized control trial population.

Methods
This study is a subgroup analysis of LH (n=119) and RH (n=213) within the study population of the ORANGE-II-PLUS trial, an international, double-blinded trial with patients randomly assigned to either open (n=166) or laparoscopic hemihepatectomy (n=166). Subgroup analysis compared postoperative and oncological outcomes of open RH (n=108) vs open LH (n=58), laparoscopic RH (n=105) vs laparoscopic LH (n=61), and open RH vs laparoscopic RH.

Results
The RH and LH groups, aside from a higher proportion of malignant tumours and preoperative portal-vein embolization in RH, were well-matched. RH was associated with longer operating times across both the open and laparoscopic approach (263 minutes, open RH vs. 240 minutes open LH; p=.032) (332 minutes, laparoscopic RH vs. 275 minutes laparoscopic RH; p<.001). Intraoperative blood loss was higher in RH in open surgery (500 mL, RH vs. 325mL, LH; p=.006), but not in laparoscopy. Compared to RH, time to functional recovery was median 1 day (p=.001) and 2 days (p<0.001) shorter for LH in open and laparoscopic surgery respectively. No significant differences were observed between RH and LH in conversions, postoperative complications, morbidity, mortality, survival, and oncological outcomes. Laparoscopic RH had a shorter time to functional recovery and length of hospital-stay compared with open RH. There was no difference in other outcomes between open RH and laparoscopic RH.

Conclusion
RH is technically more complex and has a bigger impact on the patient postoperatively than LH. Despite this, the clinical benefits of laparoscopy remain apparent in right-sided resections. These results support the implementation of the laparoscopic approach for RH in technically feasible cases.

Genomineerd voor Pélerìn semi-arts prijs

Cognitive development in children with absence epilepsy, a case-controlled prospective study.

Twan. P. C. Voncken1,2,3, Jos G. M. Hendriksen2,3, Mariette H. J. A. Debeij-Van Hall2, Eric L. A. Fonseca Wald1, R. Jeroen Vermeulen1,3, Sylvia Klinkenberg1,3

1 Department of Neurology, Maastricht University Medical Center+, Maastricht, The Netherlands;
2 Academic Center for Epileptology, Epilepsy Center Kempenhaeghe, Heeze, The Netherlands;
3 School for Mental Health and Neuroscience, Maastricht University, Maastricht, The Netherlands;

Introduction
Absence epilepsy (AE) in childhood is the most common form of Idiopathic generalized epilepsy (IGE) in children below the age of 12 years and represents 10% of all epilepsies with an onset in childhood. In contrast to previous beliefs on the benign nature of absences, recent research has identified possible comorbid deficits across a wide range of neurocognitive abilities. As neurocognitive deficits may develop over time and data on long-term follow-up of neurocognitive development is lacking, it is important to start research on this developmental profile. Identifying possible early prognostic factors and study cognitive outcome over time might assist in treating these children more effectively. This study aims to investigate neurocognitive development in AE patients over time compared to healthy control children.

Methods
We included eighteen children with AE and fifteen age-and-gender matched healthy controls in a prospective follow-up study. We assessed cognitive performance using different neuropsychological tests at the time of inclusion and after two years of follow-up. We analysed cognitive development of AE patients over time and compared this to healthy controls.

Results
AE patients showed no clinically significant changes in cognitive functioning over time (average follow-up time is 29.7 ± 7.9 months) and all test scores were within normal clinical range. Compared to healthy controls, AE patients showed lower cognitive functioning on tests for processing speed, visual motor function, and reading speed at baseline, however scores were within normal clinical range. After two years these differences between groups were no longer present and neurocognitive performance remained stable over time.

Conclusion
In this small study group, we found lower cognitive functioning in several cognitive domains in AE patients compared to healthy controls. However, cognitive performance was still within normal clinical range. Cognitive development in patients was stable after two years follow-up with no clinically significant changes in cognitive functioning. Most important, AE patients did not show cognitive decline over time. Further research, including larger study populations and behavioural evaluation, is necessary to examine how AE patients perform in daily life including school and to examine the possible long-term effects of medication on neurocognitive functioning.

Arts-onderzoeker categorie

Left atrial strain combined with natriuretic peptides simplifies heart failure with preserved ejection fraction diagnosis

Jerremy Weerts MD (1), Arantxa Barandiarán Aizpurua MD (1), Ravi B. Patel MD, PhD (2), Hesam Amin MD (1), Sandra Sanders-van Wijk MD, PhD (1,3), Sanne G.J. Mourmans MD (1), Anouk Achten MD (1), Arno A. van de Bovenkamp MD (4), Louis M. Handoko MD, PhD (4), Hans-Peter Brunner-La Rocca MD (1), Sanjiv J. Shah MD, PhD (2), Christian Knackstedt MD, PhD (1), Vanessa P.M. van Empel MD, PhD (1)

1 Department of Cardiology, Cardiovascular Research Institute Maastricht (CARIM), Maastricht University Medical Centre (MUMC+), Maastricht, the Netherlands
2 Northwestern University Feinberg School of Medicine, Chicago, IL, USA.
3 Department of Cardiology, Zuyderland Medical Center, Heerlen, the Netherlands,
4 Department of Cardiology, Amsterdam University Medical Centers, location VU University Medical Center, Amsterdam, The Netherlands

Introduction
Heart failure (HF) with preserved ejection fraction (HFpEF) is challenging to diagnose, while patient numbers rise to millions globally. Current HF guidelines focus on the HFA-PEFF and H2FPEF algorithms for HFpEF diagnosis. However, both algorithms have a large discrepancy and often require additional invasive or laborious diagnostic investigation. A simplified approach is needed to facilitate HFpEF diagnosis. Given the atrial sensitivity to elevated filling pressures and left ventricular (LV) (diastolic) dysfunction, we hypothesized that applying a simple approach using left atrial (LA) measures and circulating brain natriuretic peptides (BNP) may improve current diagnostic HFpEF processes.

Methods
Clinical data, echocardiography and HF diagnosis were obtained in two prospective cohorts dedicated to HFpEF management in Maastricht and Chicago. LA reservoir strain (LASr) was manually assessed using speckle-tracking echocardiography on apical 4- and 2-chamber views. Patients with cardiac devices or insufficient echocardiography quality were excluded. A simplified HFpEF diagnostic approach was developed based on LASr values below lower-limit of normal of controls without HF, elevated (NT-pro)BNP, and atrial fibrillation (AF) status, called the LASr/BNP approach. Data derivation and validation was performed in the Maastricht and Chicago cohort, respectively. Diagnostic performances were assessed by area under the receiver operating characteristic curve derivatives and compared using DeLong test.

Results
In Maastricht, HFpEF patients (n=238, 83.5%) compared to controls without HF (n=47, 16.5%) were older, had more often AF, and LASr was significantly lower (24.1±12.1% vs. 38.1±10.8%, p=<0.001). LASr cut-off for HFpEF diagnosis was <19.3%. The LASr/BNP approach resulted in 173 (61%) HFpEF and 4 (1%) incorrect diagnoses, yielding a good specificity (92%) and positive predictive value (98%) that was non-inferior to the HFA-PEFF (p=0.207) and better than the H2FPEF algorithm (p<0.001). If LASr/BNP was not abnormal, subsequently applying the algorithms resulted in 26% (HFA-PEFF) and 56% (H2FPEF) fewer patients that required additional diagnostics compared to using these algorithms without the LASr/BNP approach. Comparable results from the Chicago cohort validated these findings.

Conclusion
Applying a simple diagnostic LASr/BNP approach largely facilitated HFpEF diagnosis in patients suspected of HFpEF. This simple approach also decreased demanding additional diagnostics of both HFA-PEFF and H2FPEF algorithms if LASr/BNP was not clearly impaired.

Arts-onderzoeker categorie

Surgical excision versus photodynamic therapy and topical 5% fluorouracil in treatment of Bowen's disease: a multicenter randomized controlled trial

Shima Ahmady, MD,1,2 Patty J. Nelemans, MD, PhD,3 Nicole W. J. Kelleners-Smeets, MD, PhD,1,2 Aimee H.M.M. Arits, MD, PhD,1,2,4 Michette J.M. de Rooij, MD, PhD,5 Janneke P. H.M. Kessels, MD, PhD,6 Brigitte A. B. Essers, MD, PhD,7 and Klara Mosterd, MD, PhD1,2

1. Department of Dermatology, Maastricht University Medical Center, Maastricht, the Netherlands
2. GROW School for Oncology and Reproduction, Maastricht University Medical Center, Maastricht, the Netherlands
3. Department of Epidemiology, Maastricht University, Maastricht, the Netherlands
4. Department of Dermatology, Catharina Hospital, Eindhoven, the Netherlands
5. Department of Dermatology, VieCuri Medical Center, Venlo, the Netherlands
6. Department of Dermatology, Zuyderland Medical Center, Heerlen, the Netherlands
7. Department of Clinical Epidemiology and Medical Technology Assessment, Maastricht University Medical Center, Maastricht, the Netherlands

Introduction
The incidence of non-melanoma skin cancer is increasing. Bowen's disease, an intra-epidermal squamous cell carcinoma (SCC) in situ, has an incidence of 14.9-27.8/100,000 in North America. Although Bowen's disease is not invasive, treatment is aimed at decreasing any progression risk into invasive SCC.
There are multiple treatment options for Bowen's disease, such as surgical excision, photodynamic therapy (PDT) and fluorouracil cream.7-14 Surgical excision is probably the most effective treatment with sustained clearance at 1 year of 95% or higher. The major advantage of surgical excision is the possibility of histological evaluation to rule out an invasive component and assess the completeness of excision. However, surgery is an invasive procedure with disadvantages such as the risk of complications, a painful procedure and the fact that a procedure is timely and costly. Moreover, because a safety margin of 5 mm is advised for high clearance rates, surgical excision leads to relatively large scars, which seems contradictory for lesions that have a superficial, and only epidermal localization. Therefore non-invasive treatments, such as PDT and fluorouracil cream are recognized as acceptable treatment options in international guidelines. The opportunity to treat multiple lesions at once and a good cosmetic result are important benefits of both treatments.
Currently, there is no consensus on the most optimal therapy in Bowen's disease. Large randomized controlled trials with head-to-head comparison of treatments for Bowen's disease are lacking. We aimed to compare the effectiveness of 5-fluorouracil cream and MAL-PDT with surgical excision in Bowen's disease.

Methods
In this single blind, non-inferiority, randomized controlled multicenter trial, we enrolled patients with a histologically proven Bowen's disease at four hospitals in the Netherlands. Patients were randomly assigned to surgical excision, fluorouracil cream or methylaminolevulinate photodynamic therapy. The primary outcome was the proportion of patients with sustained clearance at 12 months post-treatment .

Results
Between May 2019 and January 2021, 250 patients were included. One year after treatment, the proportion of patients with sustained clearance was 97.4% for the surgical excision group, 85.7% for fluorouracil, and 82.1% for MAL-PDT. Rest of the results will follow and will be discussed.

Conclusion
Will be discussed.

Arts-onderzoeker categorie

A patient decision aid for patients with superficial basal cell carcinoma: the effect on the level of decisional conflict, knowledge and treatment decisions

Lieke C.J. van Delft1,2, Brigitte A.B. Essers3, Patty J. Nelemans4, Klara Mosterd1,2, Marieke van Winden5, Ine F.L. Romaen6, Sean Retra5, Aimee H.M.M. Arits1,6, Myrthe Moermans7, Peter S. Steijlen1,2, Satish F.K. Lubeek4, Nicole W.J. Kelleners-Smeets1,2

1 Department of Dermatology, Maastricht University Medical Center+, Maastricht;
2 GROW School for Oncology and Reproduction, Maastricht University;
3 Department of Clinical Epidemiology & Medical Technology Assessment, Maastricht University Medical Center+, Maastricht;
4 Department of Epidemiology, Maastricht University, Maastricht;
5 Department of Dermatology, Radboud University Medical Center, Nijmegen;
6 Department of Dermatology, Catharina Hospital, Eindhoven;
7 Student at the department of Dermatology, Maastricht University, Maastricht.

Introduction
Patients with a superficial basal-cell carcinoma (sBCC) can choose between several treatment options with specific advantages and disadvantages. A patient decision aid (PDA) might facilitate making a personalized decision.
This study evaluates whether the use of a PDA results in a decreased level of decisional conflict, and increased knowledge on prevention, recognition of BCC, and treatment options. Secondly, this study investigates if patients that did versus did not use a PDA preferred surgical or noninvasive treatment and if there were patient or tumor characteristics that influenced this decision.

Methods
A prospective multicentre observational study was performed amongst patients with a newly diagnosed sBCC comparing a control group that did not use the PDA with a group that did (PDA-group). The primary outcome was the level of decisional conflict measured by the total mean score (0-100) on the 'decisional conflict scale' (DCS) before treatment. Higher scores correspond with higher levels of decisional conflict. Knowledge was evaluated by using a questionnaire. Treatment decisions and patient and tumour characteristics were recorded.

Results
120 patients were included in the control group and 133 patients in the PDA-group. There was no difference in mean total DCS score: 22.78 (SD: 14.76) in the control group versus 22.03 (SD: 14.42) in the PDA-group. Using the PDA resulted in a significant increase of knowledge on recognition of BCC ($p<0.001$) and treatment options for sBCC ($p=0.005$). In the control group 59.2% chose surgical treatment over noninvasive treatment versus 51.4% in the PDA-group ($p=0.254$). Patients in the PDA group more often felt like they made an effective decision 3 months post-treatment, though still 40.4% of these patients would have chosen a different treatment retrospectively.

Conclusion
In patients with sBCC, use of a PDA did not result in a significant decrease of mean level of decisional conflict. Using the PDA did lead to significantly improved knowledge on BCC and its treatment options, and patients more often felt like they made an effective treatment decision post-treatment.

Arts-onderzoeker categorie

Five-year results of a randomized controlled trial comparing effectiveness of surgery and combined treatment with superficial curettage followed by 5% imiquimod cream in patients with nodular basal cell carcinoma

Babette J. A. Verkouteren (1,2), Patty Nelemans (3), Kelly A. E. Sinx (1,2), Nicole W.J. Kelleners-Smeets (1,2), Veronique J.L. Winnepenninckx (4), Aimee I.H.H. Arits (1,2,5), Klara Mosterd (1,2)

(1) Department of dermatology, Maastricht University Medical Center+, Maastricht, the Netherlands
(2) GROW School for Oncology and Reproduction, Maastricht University, Maastricht, the Netherlands
(3) Department of epidemiology, Maastricht University, Maastricht, the Netherlands
(4) Department of pathology, Maastricht University Medical Center+, Maastricht, the Netherlands
(5) Department of dermatology, Catharina Hospital, Eindhoven, the Netherlands

Introduction
Basal cell carcinoma (BCC) is the most common malignant skin neoplasm within the Caucasian population and its incidence is still rising. Of all histological subtypes of BCC, nodular BCC (nBCC) is the most common. Surgical excision is the gold standard for treatment of nBCC with the highest efficacy rates compared to non-invasive treatments such as imiquimod 5% cream. However, efficacy rates of approximately 85% haven been reported for imiquimod cream after 1 and 3 years follow-up. The use of imiquimod cream in nBCC can decrease the workload of physicians and might also lead to a better cosmetic outcome. As long-term results on efficacy of imiquimod cream are sparse, this study assessed the effectiveness and cosmetic outcome of nBCC treatment with superficial curettage and imiquimod 5% cream compared with surgical excision 5-years post-treatment.

Methods
Patients with histologically proven nBCC were enrolled in a randomized, controlled, non-inferiority trial in two hospitals in the Netherlands. These patients were randomized in a 1:1 ratio to surgical excision or superficial curettage followed by imiquimod 5% cream. Randomization was stratified by center (n=2). The primary endpoint was the 5-year cumulative probability of remaining free from treatment failure. Five year follow-up visits were planned between January 2021 and August 2022. A Cox proportional hazard model was used to calculate hazard ratios for treatment failure with 95% confidence intervals. Modified intention-to-treat and a per-protocol analyses were performed. Secondary outcomes were patient satisfaction and patient- and physician related cosmetic outcomes, measured by two standardized questionnaires. This study was registered at ClinicalTrials.gov (NCT02242929).

Results
One hundred forty-five patients (median age 68 years [range, 31-89 years], 53.1% male) were randomized: 73 to the superficial curettage and imiquimod 5% cream group and 72 to the surgical excision group. All patients received the allocated treatment. Median size of the BCC was 7mm [range, 4-20mm]. BCCs were mostly located on the trunk (38.6%), followed by the head/neck area (29.7%) and the upper (15.9%) and lower extremities (15.9%). The 5-year cumulative probability of remaining free from treatment failure will be discussed during the symposium.

Conclusion
Conclusions will be discussed during the symposium.

Arts-onderzoeker categorie

Lower perceived executive functioning years after preeclamptic pregnancy

R.J. Alers [1,2]; C. Ghossein-Doha [2,3,4]; L.P.W. Canjels [1,2,5]; E.S.H. Muijtjens [1]; Y. Brandt [4,6], M.E. Kooi [4,6], S.C. Gerretsen [6], J.F.A. Jansen [6,7,8]; W.H. Backes [4,6,7]; P.P.M. Hurks [9]; V. van de Ven [10]; M.E.A. Spaanderman [1,2,5]

1 Department of Obstetrics and Gynecology, Maastricht University Medical Center+ (MUMC+), Maastricht, the Netherlands;
2 GROW, School for Oncology and Developmental Biology, Maastricht University, Maastricht, the Netherlands;
3 Department of Cardiology, MUMC+, Maastricht, the Netherlands;
4 CARIM, School for Cardiovascular Diseases, Maastricht University, Maastricht, the Netherlands;
5 Department of Obstetrics and Gynecology, Radboud University Medical Center, Nijmegen, the Netherlands;
6 Department of Radiology and Nuclear Medicine, Maastricht University Medical Center, Maastricht, the Netherlands;
7 MHeNs, School for Mental Health and Neuroscience, Maastricht University, Maastricht, the Netherlands;
8 Department of Electrical Engineering, Eindhoven University of Technology, Eindhoven, the Netherlands;
9 Department of Neuropsychology and Psychopharmacology, Faculty of Psychology and Neuroscience, Maastricht University, the Netherlands;
10 Department of Cognitive Neuroscience, Faculty of Psychology and Neuroscience, Maastricht University, the Netherlands

Introduction
Preeclampsia, a hypertensive pregnancy disorder, is a leading cause of maternal and fetal morbidity and mortality with cardio- and cerebrovascular implications. Women report serious disabling cognitive complaints after preeclampsia, especially involving executive function, but the extent and time course of these complaints are unknown.

Methods
The Queen of Hearts cross-sectional study involved women with a preeclamptic history (n=1036) and controls with a history of normotensive pregnancies (n=526). Executive functioning was assessed with the Behavior Rating Inventory of Executive Function for Adults (BRIEF-A), consisting of a Global Executive Composite (GEC) and 11 subscales measuring behavioral regulation, metacognition, and related cognitive functions. Covariate-adjusted absolute and relative risk estimates of clinical complaints after (preeclamptic) pregnancy were calculated over time postpartum using moderated regression analyses.

Results
Regarding GEC, 23.2% [95% confidence interval (CI) 19.0-28.1%] of formerly preeclamptic women report clinical complaints compared to 2.2% [95%CI 0.8-6.0%] of controls (P<0.001) shortly after childbirth (relative risk=9.20 [95%CI 3.33-25.38]). Group differences diminished yet remained visible at least 19 years postpartum. Regardless of preeclamptic history, women with lower educational attainment, mood or anxiety disorders, or obesity were especially at risk. Neither severity of preeclampsia, multiple gestation, method of delivery, preterm birth, or perinatal death related to executive functioning. Results for most subscales were comparable to the GEC results.

Conclusion
Compared to women after normotensive pregnancies, after preeclampsia, women were nine times more likely to experience significant clinical difficulties in executive functioning. Despite overall steady improvement, problems persisted over decades after childbirth. (ClinicalTrials.gov Identifier: NCT02347540)

Arts-onderzoeker categorie

Clinical evaluation of automated segmentation for body composition analysis on abdominal L3 CT slices in polytrauma patients

Leanne L.G.C. Ackermans1,2, Leroy Volmer3, Quince M.M.A. Timmermans1, Ralph Brecheisen2, Steven M. W. Olde Damink2,4, Andre Dekker5, Daan Loeffen6, Martijn Poeze1, Taco J. Blokhuis1, Leonard Wee3,5† and Jan A. Ten Bosch1

1 Department of Traumatology, Maastricht University Medical Centre+, 6229 HX Maastricht, The Netherlands. l.ackermans@maastrichtuniversity.nl, q.timmermans@mumc.nl, taco.blokhuis@mumc.nl, jan.ten.bosch@mumc.nl, m.poeze@mumc.nl
2 Department of Surgery, NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University Medical Centre+, 6229 HX Maastricht, The Netherlands r.brecheisen@maastrichtuniversity.nl
3 Department of Radiation Oncology (MAASTRO), GROW School for Oncology and Reproduction, Maastricht University Medical Centre+, Maastricht, The Netherlands leroy.volmer@maastro.nl
4 Department of General, Visceral and Transplantation Surgery, RWTH University Hospital Aachen, 52074 Aachen, Germanysteven.oldedamink@maastrichtuniversity.nl
5 Clinical Data Science, Faculty of Health Medicine and Lifesciences, Maastricht University, Paul Henri Spaaklaan 1, 6229 GT, Maastricht, The Netherlands leonard.wee@maastro.nl, andre.dekker@maastro.nl
6 Department of Radiology, Maastricht University Medical Centre+, 6229 HX Maastricht, The Netherlands. d.loeffen@mumc.nl
* Correspondence: (LA) l.ackermans@maastrichtuniversity.nl, tel 0031-433877489

Introduction
Sarcopenia is a muscle disease that involves loss of muscle strength and physical function and is associated with adverse health effects. Even though sarcopenia has attracted increasing attention in the literature, many research findings have not yet been translated into clinical practice. We aim to explore the potential for clinical utilization of robustly validated deep learning neural network for automated segmentation of L3 CT slices, and hence evaluate the usability of such a tool for clinical practice

Methods
A deep learning neural network was trained on a multi-centre collection of 3413 abdominal cancer surgery subjects to automatically segment muscle and adipose tissue at the L3 lumbar vertebral level. A further 536 polytrauma subjects were used as an independent test set. In order to determine the potential clinical usability, randomly selected segmentation images were presented to a panel of experienced clinicians to rate on a Liekert scale.

Results
Deep learning results gave excellent agreement versus a human operator for the body composition indices, with Concordance Correlation Coefficient for skeletal muscle index of 0.92, Skeletal muscle radiation attenuation 0.94, Visceral Adipose Tissue index 0.99 and Subcutaneous Adipose Tissue Index 0.99. Triple-blinded visual assessment of segmentation by clinicians correlated only to the Dice coefficient, but had no association to quantitative body composition metrics which were accurate irrespective of clinicians' visual rating.

Conclusion
A deep learning method automatic segmentation of truncal muscle, visceral adipose and subcutaneous adipose on individual L3 CT slices has been independently validated against expert human-generated results for an enlarged polytrauma registry dataset. Time efficiency, consistency and high accuracy relative to human experts suggest that quantitative body composition analysis with deep learning should is a promising tool for clinical application in a hospital setting.

Arts-onderzoeker categorie

Patient-Reported Outcome Measurement-Haemorrhoidal Impact and Satisfaction Score (PROM-HISS): Development, Reliability and Construct Validity

S.Z. Kuiper (1), M.L. Kimman (2), R.R. Van Tol (3), S.F. Waardenburg (2), S.M.J. Van Kuijk (2), C.D. Dirksen (2), S.O. Breukink (1,4,5).

(1) Department of Surgery, Maastricht University, School of Nutrition and Translational Research in Metabolism (NUTRIM), Universiteitssingel 50, 6229 ER, Maastricht, the Netherlands
(2) Department of Clinical Epidemiology and Medical Technology, Care and Public Health Research Institute (CAPHRI), Maastricht University Medical Centre, Oxfordlaan 10, 6202 AZ, Maastricht, the Netherlands
(3) Department of Surgery, Diakonessenhuis Medical Centre, Bosboomstraat 1, 3582 KE, Utrecht, the Netherlands
(4) Department of Surgery, Maastricht University, School for Oncology and Reproduction (GROW), Universiteitssingel 50, 6229 ER, Maastricht, the Netherlands
(5) Department of Surgery, Maastricht University Medical Centre, Oxfordlaan 10, 6202 AZ, Maastricht, the Netherlands

Introduction
Haemorrhoidal disease (HD) is a frequently occurring disorder with a negative impact on a patient's quality of life. The Core Outcome Set (COS) for HD trials states that symptoms and satisfaction are the core outcomes to be evaluated using a Patient Reported Outcome Measure (PROM). We describe the development and validation of the PROM-Haemorrhoidal Disease and Satisfaction Score (PROM-HISS).

Methods
The development of the PROM-HISS followed recommended guidelines for the development and validity of health status questionnaires. The items of the PROM-HISS were based on patient interviews, literature review and expert input. Face and content validity of the concept version were evaluated by conducting individual think-aloud interviews. Structural properties, reliability and construct validity were measured in a cross-sectional population. Reliability was tested by assessing the test-retest reliability, defined by the Intraclass Correlation Coefficient (ICC), and internal consistency measured with Cronbach's alpha. Construct validity was evaluated using confirmatory factor analysis (CFA) and hypotheses testing.

Results
The PROM-HISS consisted of the following three domains: (1) HD symptoms, (2) impact of HD on daily activities, and (3) satisfaction with treatment. The first domain comprised of five items focused on the experienced burden of blood loss, pain, prolapse, soiling and itching. The face and content validity check among 10 patients led to minor adjustments to the wording of some items. The PROM-HISS was completed by 102 patients (65% male), with a mean age of 58 years (23-81 years) and primarily diagnosed with HD grade III (39%). The ICCs of the different items in the domain 'Symptoms' ranged between 0.56 and 0.79 and were interpreted as good and the Cronbach's alpha value was 0.80 and considered satisfactory. The CFA provided further evidence for construct validity with a good model fit. In line with our hypotheses, a correlation was found between a high score on the symptoms of HD, a high impact of HD on daily activities (Pearson's $r = 0.632$, $p<0.01$), and a low degree of satisfaction (Pearson's $r = 0.378$, $p<0.01$).

Conclusion
The PROM-HISS is a reliable and valid instrument to evaluate symptoms of HD, impact on daily activities and satisfaction with treatment.

Arts-onderzoeker categorie

Patient reported outcomes after laparoscopic versus open hemihepatectomy within an enhanced recovery program, the ORANGE-II-PLUS Randomized Clinical trial: A Quality of Life and Body image analysis

Bram Olij (1,18), Robert S. Fichtinger (1,12), Merel Kimman (19), Luca A. Aldrighetti (2), Mohammad Abu Hilal (3), Roberto I. Troisi (4), Robert P. Suttcliffe (5), Marc G.H. Besselink (6), Somaiah Aroori (7), Krishna V. Menon (8), Bjørn E. Edwin (9), Mathieu D'Hondt (10), Valerio Lucidi (11), Tom F. Ulmer (12), Rafael Diaz-Nieto (13), Zahir Soonawalla (14), Steven White (15), Gregory Sergeant (16), Francesca Ratti (2), Christoph Kümmerli (4,17), Lloyd Brandts (1), Siân A. Pugh (4), Zina Eminton (4,17), John N. Primrose (4,17), Ronald M. Van Dam (1, 12, 18), ORANGE II PLUS Collaborative.

1. Maastricht University Medical Center+, Maastricht, Netherlands;
2. IRCCS San Raffaele Hospital, Milan, Italy;
3. University Hospital Southampton NHS Foundation Trust, Southampton, United Kingdom;
4. Ghent University Hospital, Ghent, Belgium;
5. University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom;
6. Amsterdam University Medical Centers, University of Amsterdam, Amsterdam, Netherlands;
7. University Hospitals Plymouth NHS Foundation Trust, Plymouth, United Kingdom;
8. King's College Hospital NHS Foundation Trust, London, United Kingdom;
9. Oslo University Hospital, Oslo, Norway;
10. Groeninge Hospital, Kortrijk, Belgium;
11. Erasme Hospital, Brussels, Belgium;
12. University Hospital RWTH Aachen, Aachen, Germany;
13. Aintree University Hospital NHS Foundation Trust, Liverpool, United Kingdom;
14. Oxford University Hospital NHS Foundation Trust, Oxford, United Kingdom.
15. Newcastle upon Tyne NHS Foundation Trust, Newcastle, United Kingdom.
16. Jessa Hospital, Hasselt, Belgium.
17. Southampton Clinical Trials Unit, Southampton, United Kingdom;
18. GROW School for Oncology & Developmental Biology, Maastricht university, Maastricht, Netherlands
19. KEMTA, Clinical Epidemiology & Medical Technology Assessment, Maastricht, Netherlands

Introduction
New surgical techniques are continually created to improve postoperative clinical outcomes. However, the added benefit of each newly developed technique is decreasing due to increasing surgical experience and contemporary optimized recovery programs. Therefore, health-related quality of life (HRQoL) is becoming increasingly important to support clinical decision making regarding surgical approach. The international multicenter ORANGE-II-PLUS trial compared laparoscopic (LH) and open hemihepatectomy (OH). In this study we separately assess the differences in HRQoL after LH compared to OH in a randomized controlled setting.

Methods
Patients planned for hemihepatectomy (n=352), were randomly assigned to either open or laparoscopic hemihepatectomy in a 1:1 ratio. The study was conducted in 16 European centers. HRQoL was assessed using the EORTC-QLQ-C30 and QLQ-LMC21 module and a body image questionnaire (BIQ) at baseline, discharge, and at 10 days, 3, 6, and 12 months after discharge. Global Health Status (GHS) was selected as the main HRQoL endpoint. The difference in GHS and selected other HRQoL domains, 5 functioning and 4 symptom scales, of the EORTC questionnaires and BIQ between LH and OH were compared over the first year using a linear mixed model, adjusting for age, sex, center, hemihepatectomy side (left/right), and tumortype (benign/malignant). The Bonferonni method was applied to correct for multiple testing. A validated guideline was used to assess clinical relevance of the differences.

Results
The intention-to-treat analysis included 332 patients (LH n=166 vs OH n=166). GHS was significantly better across the first year after LH compared to OH with 3.19 point difference (95%CI 1.30-5.09; p=0.001). However, the clinical relevance was trivial. Physical functioning and social functioning were significantly and clinically relevant better after LH, as well as lower occurrence of bodily pain and appetite loss. Body image perception and scar aesthetics were significantly better after LH compared to OH.

Conclusion
This study confirms that LH is associated with significantly and clinically relevant higher physical and social functioning as well as significantly and clinically relevant lower bodily pain and appetite loss and better body image and scar perception as compared to OH and thus supports the choice of laparoscopy in major liver surgery.

Arts-onderzoeker categorie

The BPRECISE Trials: The development and use of novel technologies in the personalized therapeutic approach for primary and metastatic HPB tumours to increase QoL and survival

1/2 **F. Pennetta**, 1/2 B.Olij, 3 T. Cramer, 4 C. Mertens, 1/2/3 R.M. van dam, 1/2/3 U.P. Neumann

1- Maastricht University GROW
2- MUMC + Surgery
3- RTWH Aachen Surgery
4- EPFL Laboratory Switzerland

Introduction
"Primary and secondary cancers of the liver, bile ducts and pancreas are common, aggressive, and deadly. The preferred treatment is surgery, but most tumours are inoperable and require ST. Most patients do not response to general ST due to patient- and tumour-heterogeneity, therefore, require personalized approach. MFDS is a novel analytic tool that can screen combinations of ST, on cells from a tumour biopsy, reproducing an apoptotic read-out. WGS and MSI provide genetic and molecular/spatial profiling of the tumour, important characteristics that guide therapy and predict tumour response to ST.
Aim: Assess the feasibility, accuracy and efficiency of personalized ST predicted by MFDS on tumour shrinkage and response in primary and secondary hepato-, pancreatic- and biliary cancer patients. "

Methods
Multi-centred prospective cohort, 180 patients with CRLM, iCCA and mPDAC (n=60), included across 12 international centers. Biopsy is taken and sent to EPFL laboratory for MFDS analysis. MFDS feasibility, accuracy and efficacy are assessed. In step 1 (n=30) samples are analysed, patients receive induction/palliative ST based on standard-of-care guidelines. MFDS is used to predict the apoptotic response of the ST. In step 2 (n=30) receive personalized ST predicted by MFDS based on the combination of ST with the highest significant apoptotic score. The accuracy of the MFDS prediction will be assessed by qualitatively comparing apoptotic scores obtained on the biopsy to the responses in tumour size (RECIST) and metabolic activity (PERCIST). In step 2, WGS and MSI are performed.

Results
No preliminary results available.

Conclusion
Expected outcome: Personalized ST based on screening of apoptosis expression from different ST with MFDS is efficient in causing size reduction and/or remission of irresectable resectable tumors. Increase in ST response of 30% of all tumour types is expected. This approach leads to an increase in resectable tumors, longer overall and progression-free survival and improved QoL and functionality in the patients.

Arts-onderzoeker categorie

The development of a novel tool for rectal cancer patients in the watch-and-wait program: An international Delphi exercise

Alexander Pennings⁎ (1, 7), Merel Kimman (2), Andrew Renehan (3), Rodrigo Perez (4), Laura Fernandez (5), José Azevedo (5), Geerard Beets (6), Jarno Melenhorst (1, 7), Stephanie Breukink (1, 7)
Department of

Introduction
The Assessment of Burden of ColoRectal Cancer (ABCRC)-tool is an integrated tool, developed in conjunction with colorectal cancer (CRC) patients, that measures the experienced burden of disease and lifestyle parameters and visualizes the results. It has a generic module and add-on modules for specific patient populations, such as rectal cancer patients with anastomosis. This Delphi study aimed to reach consensus among patients and healthcare professionals (HP) on the outcomes to be included in questionnaire module specifically for CRC patients in the Watch-and-Wait (W&W) program.

Methods
In a modified Delphi process, a panel of CRC patients and HP involved in the W&W program for rectal cancer were subjected to two Delphi survey rounds followed by a consensus meeting. In the surveys participants were asked to score common CRC outcomes that emerged from qualitative interviews with patients and a targeted literature review into functional outcomes in the W&W population. Each outcome is scored on a 1 to 9 Likert scale, ranging from extremely unimportant to extremely important. A pre-specified threshold of ≥70% agreement was used for an outcome to be included.

Results
A total of 128 participants (75 patients and 53 HP) from four countries (The UK, Brazil, Portugal and the Netherlands) participated and scored 42 outcomes. After both rounds, 7 outcomes were deemed 'important', and 34 as 'not important'. No consensus was reached for 1 outcome and was carried over to the consensus meeting. In the final consensus meeting, 5 patients and 10 HP reached consensus on the 7 outcomes to be included: faecal incontinence, urgency, anxiety, fear of recurrence, fear of surgery, fear of stoma and happiness.

Conclusion
A modified Delphi method was used to determine the most important outcomes to be included in the W&W specific module of the ABCRC-tool. The use of this tool in the outpatient clinic has the potential to greatly improve patient-centered care and shared discussion making in daily practice.

Arts-onderzoeker categorie

Identifying characteristics of a skilled communicator in the clinical encounter: a nominal group technique study

M.J.H. Verheijden1,2, E. Giroldi1,2, V. van den Eerwegh3, M. Luijkx1, T. van der Weijden1, A. de Bruin2, A. Timmerman1

1. Department of Family Medicine, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, The Netherlands
2. Department of Educational Development and Research, School of Health Professions Educations (SHE), Maastricht University, Maastricht, The Netherlands
3. Skillslab, Faculty of Health, Medicine and Life Sciences, Maastricht University, Maastricht, the Netherlands

Introduction
In medical communication research, there has been a shift from 'communication skills' towards 'skilled communication', the latter implying the development of flexibility and creativity to tailor communication to authentic clinical situations. However, a lack of consensus currently exists what skilled communication entails. Therefore, the current study aims to identify characteristics of a skilled communicator in the clinical encounter, hereby contributing to theory building in current health communication research and informing medical training.

Methods
Between April and October 2020, 34 Dutch stakeholders (i.e. physicians, residents, faculty members, and researchers), who have expertise in doctor-patient communication in the context of the family medicine residency program, engaged in six Nominal Group Technique (NGT) sessions. Participants rank-ordered a 'top 7' of characteristics of a skilled communicator. The output of the NGT sessions was analyzed both quantitatively and qualitatively. The scores of the generated top 7 rankings were analyzed using descriptive statistics. The content of the sessions was analyzed using thematic content analysis during an iterative process in three phases: by identifying, analyzing and reporting (recurring) themes.

Results
Rankings of all NGT sessions consisted of 191 items, which were organized into 41 clusters and nine overall themes that describe characteristics of a skilled communicator. These were: (A) Being sensitive and adapting to the patient; (B) Being proficient in interpersonal communication; (C) Self-awareness, learning ability and reflective capacity; (D) Being genuinely interested; (E) Goal-oriented communication; (F) Being authentic; (G) Being proficient in patient-centered communication; (H) Active listening; (I) Collaborating with the patient.

Conclusion
The identified characteristics inform and conceptualize a skilled communication approach to support learning in postgraduate medical training, which is outlined in a conceptual model. In this model, two parallel processes are key in developing adaptive expertise in communication: (1) being sensitive and adapting communication to the patient, and (2) monitoring communication performance in terms of self-awareness and reflective capacity. The identified characteristics and the conceptual model may provide a base to develop a learner-centered training for skilled communication, in facilitating repeated practice and reflection. Further research should investigate how learners can be optimally supported in becoming skilled communicators during postgraduate workplace learning.

Arts-onderzoeker categorie

Trabecular, but not cortical, bone tissue protein synthesis rates in the femoral head are reduced following an intracapsular hip fracture

Floris K. Hendriks (1), Michelle E.G. Weijzen (1), Joy P.B. Goessens (1), Antoine H.G. Zorenc (1), Annemie, P. Gijsen (1), Irene Fleur Kramer (1), Martijn Poeze (2), Taco J. Blokhuis (2), Luc J.C. van Loon (1).

1: Department of Human Biology, NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University, Maastricht, The Netherlands
2: Department of Surgery, division of Trauma Surgery, Maastricht University Medical Centre+, Maastricht, The Netherlands

Introduction
Musculoskeletal tissues are in a constant state of turnover, with a dynamic equilibrium between tissue protein synthesis and breakdown rates. The synthesis of protein allows musculoskeletal tissues to heal following injury. However, impaired tissue healing is observed following certain injuries, such as geriatric hip fractures. Though these fractures are assumed to eliminate the regenerative capabilities of femoral bone tissue, the actual impact on in vivo bone protein synthesis rates has not been determined.

Methods
In the present study, 10 patients (age: 79±10 y, BMI: 24±4 kg/m2) with an acute (<24 h) intracapsular hip fracture received a primed continuous intravenous infusion of L-[ring-13C6]-phenylalanine before and throughout their hip replacement surgery. Trabecular and cortical bone tissue from the femoral head and shaft were sampled during surgery to assess protein synthesis rates of affected (femoral head) and unaffected (shaft) bone tissue, respectively. In addition, tissue samples of gluteus maximus muscle, synovium, ligamentum teres, and femoral head cartilage were collected. Tissue-specific protein synthesis rates were assessed by measuring the incorporation of L-[ring-13C6]-phenylalanine in tissue protein. Data were analyzed by paired-sample t-tests and are expressed as median [interquartile ranges].

Results
Femoral head trabecular bone protein synthesis rates (0.056 [0.024-0.086] %/h) were significantly lower when compared to femoral shaft trabecular bone protein synthesis rates (0.081 [0.056-0.118] %/h; P=0.043). Cortical bone protein synthesis rates did not differ between the femoral head and shaft (0.041 [0.021-0.078] and 0.045 [0.028-0.073] %/h, respectively; P>0.05). Skeletal muscle, synovium, ligamentum teres, and femoral head cartilage protein synthesis rates averaged 0.080 [0.048-0.089], 0.093 [0.051-0.130], 0.121 [0.110-0.167], and 0.023 [0.015-0.039] %/h, respectively.

Conclusion
In contrast to the general assumption that the femoral head is avital after an intracapsular hip fracture in the elderly, our data show that protein synthesis is still active in femoral head bone tissue during the early stage following an intracapsular hip fracture in older patients. Trabecular, but not cortical, bone protein synthesis rates are lower in the femoral head when compared to the femoral shaft in older patients following an acute intracapsular hip fracture.

Arts-onderzoeker categorie

Prediction models for prognosis of COVID-19 in the Intensive Care Unit: external validation in a multinational observational cohort study

Daniek A.M. Meijs (1,2), Sander M.J. van Kuijk (3), Laure Wynants (3-5), Björn Stessel (6,7), Jannet Mehagnoul-Schipper (8), Anisa Hana (2,9), Clarissa I.E. Scheeren (10), Dennis C.J.J. Bergmans (1,11), Johannes Bickenbach (12), Margot Vander Laenen (13), Luc J.M. Smits (3), Iwan C.C. van der Horst (1,14), Gernot Marx (12), Dieter Mesotten (7,13), Bas C.T. van Bussel (1,3), CoDaP investigators (1-14)

1. Department of Intensive Care Medicine, Maastricht University Medical Centre + (Maastricht UMC+), Maastricht, the Netherlands
2. Department of Intensive Care Medicine, Laurentius Ziekenhuis, Roermond, the Netherlands
3. Department of Epidemiology, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, the Netherlands
4. Department of Development and Regeneration, KULeuven, Leuven, Belgium
5. Epi-centre, KULeuven, Leuven, Belgium
6. Department of Intensive Care Medicine, Jessa Hospital, Hasselt, Belgium
7. Faculty of Medicine and Life Sciences, UHasselt, Diepenbeek, Belgium
8. Department of Intensive Care Medicine, VieCuri Medisch Centrum, Venlo, the Netherlands
9. Department of Intensive Care Medicine, University Hospital of Zurich, Zurich, Switzerland
10. Department of Intensive Care Medicine, Zuyderland Medisch Centrum, Heerlen/Sittard, the Netherlands
11. School of Nutrition and Translational Research in Metabolism (NUTRIM), Maastricht University, Maastricht, the Netherlands
12. Department of Intensive Care Medicine, University Hospital Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen, Aachen, Germany
13. Department of Intensive Care Medicine, Ziekenhuis Oost-Limburg, Genk, Belgium
14. Cardiovascular Research Institute Maastricht (CARIM), Maastricht, the Netherlands

Introduction
Many prediction models for prognosis in Coronavirus Disease 2019 (COVID-19) have been developed. External validation is mandatory before applying these models in the Intensive Care Unit (ICU). In this study, promising prognostic models were selected and validated in an independent ICU population.

Methods
In this multinational cohort study, routinely available data from COVID-19 patients admitted to 7 ICUs within the Euregio Meuse-Rhine were collected during the first pandemic wave. Promising models for COVID-19 were selected based on model type, predictors, outcomes, and reporting. Furthermore, general ICU prediction scores were assessed. Multiple imputation was used to handle missing data. Model discrimination was assessed by the area under the receiver operating characteristic (ROC) curve and calibration by calibration-in-the-large and the calibration plot. A random-effects meta-analysis was used to pool results from the Euregio country parts. Moreover, sensitivity analyses without censored transferred patients were performed.

Results
From March to August 2020, 551 patients were admitted. Mean age was 65.4 ± 11.2 years, 29% were women, and ICU mortality was 36%. 9 out of 238 published prediction models were eligible for external validation. The pooled areas under the ROC curve of the models were between 0.53 and 0.70 and pooled calibration-in-the-large between -9% and 6%. Calibration plots showed generally poor but, for the 4C Mortality score (unclear risk of bias) and the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC) score (high risk of bias), moderate calibration. Sensitivity and country-specific analyses revealed similar results.

Conclusion
First, only 9 (3.7%) COVID-19 prognostic models could be externally validated in the Euregio ICU cohort based on routine data. Second, 2 of these 9 models showed reasonable discrimination and moderate calibration. For future pandemics, better models based on routine data are needed for admission decision-making.

Arts-onderzoeker categorie

Online professionalism according to medical students and residents: a focus group study

Sebastiaan A. Pronk 1,2, Simone L. Gorter 3, Scheltus J. van Luijk 2, Guy J. Oudhuis 4, Pieter C. Barnhoorn 5, Walther N.K.A. van Mook 1,2,6

1. Department of Intensive Care Medicine, Maastricht University Medical Centre, Maastricht, The Netherlands
2. Academy for Postgraduate Medical Education, Maastricht University Medical Centre, Maastricht, The Netherlands
3. Department of Internal medicine, division of Rheumatology, Maastricht University Medical Centre, Maastricht, The Netherlands
4. Department of Medical Microbiology, Maastricht University Medical Centre, Maastricht, The Netherlands
5. Leiden University Medical Centre, Leiden, The Netherlands
6. School of Health Professions Education, Maastricht University, Maastricht, The Netherlands

Introduction
Social media influence the practice of healthcare professionals and consequently medical organisations have issued guidelines hereabout. However, studies on online professionalism and social media are scarce, and so far mainly survey-based. This unique qualitative study explores professionalism in relation to social media use in healthcare among Dutch medical students and residents and maps their perceived educational needs regarding these issues.

Methods
One-hour semi-structured focus group interviews were conducted between September 2019 and June 2021 in two different Dutch university medical centers (Maastricht and Leiden). Interviews were recorded, transcribed verbatim and analysed thematically, iteratively and independently by two researchers applying the principles of constant comparison, primary, secondary and tertiary coding.

Results
Twenty-four medical students and twenty-two residents participated in seven focus groups. The participants' private norms and values formed their professional behaviour on social media. Participants differentiated clearly between 'private' and 'professional' social media use. Patients' 'friendship' or 'follow' requests from social media directed to students and residents occurred and were all rejected. Both groups reported that addressing online professionalism lapses from colleagues was uncommon and depended of the interpersonal relationship. Students voiced that discussion about the 'grey areas' of professional social media use is needed in undergraduate training. In contrast, residents noted that they already knew how to deal with such 'grey' situations. As opposed to the above-mentioned challenges, residents perceived the need to learn about the risks and opportunities of social media use to enhance their careers.

Conclusion
Social media use among participants is widespread and offers new challenges and opportunities for educators. Educators should be aware of the fact that the educational needs regarding social media use differ between medical students and residents. Students voiced interest in the 'grey areas' of social media use, whereas residents requested guidance for improving job opportunities by using social media. In both undergraduate and postgraduate training attention should be focused on improving the professional use of social media.

Arts-onderzoeker categorie

Are all routine spondyloarthritis outpatient visits considered useful by rheumatologists? An explorative clinical practice study

Hermans K. (1, 2), Boonen A. (1, 2), van Tubergen A.M. (1, 2)

1. Department of Internal Medicine, Division of Rheumatology; Maastricht University Medical Center; Maastricht, The Netherlands;
2. Care and Public Health Research Institute (CAPHRI); Maastricht University, Maastricht, The Netherlands;

Introduction
Many rheumatology outpatient clinics experience capacity issues and optimizing the efficiency of care is necessary to safeguard access to care for patients and to manage workload for caregivers. Spondyloarthritis (SpA) is among the most prevalent conditions in rheumatology practice, approximately affecting 1% of the population worldwide. Whether regular pre-booked follow-up is required for all patients with SpA is uncertain. Data regarding the proportion of potentially unnecessary visits when monitoring these patients according to the current standard of care are lacking. This study aimed to determine (a) the proportion of routine SpA outpatient visits considered (un)necessary by rheumatologists, (b) characteristics of (un)necessary visits and (c) whether pre-visit remote health outcome assessments can identify ensuing visits' necessity.

Methods
A random sample of follow-up visits was evaluated at the SpA outpatient clinic of the Maastricht University Medical Centre. Before visits, patient-reported outcomes and disease activity were collected through an online health registry (SpA-Net). After visits, rheumatologists were asked whether visits were considered necessary and whether therapy was altered. Clinical actions during visits were documented alongside demographic and clinical patient characteristics and compared for necessary versus unnecessary visits. Multivariable logistic regressions explored which pre-visit health outcomes (disease activity, patient reported physical and mental health) were associated with the perceived necessity of visits. Predictive value was calculated for high disease activity thresholds of the Ankylosing Spondylitis Disease Activity Score (ASDAS) and patient global assessment (PtGA).

Results
Of 114 outpatient visits, 39 (34.2%) were considered unnecessary by rheumatologists. These visits involved fewer treatment changes (6 of 39 (15.4%) versus 39 of 75 (52.0%) visits) and clinical actions (9 of 39 (23.1%) versus 47 of 75 (62.7%) visits) compared to visits considered necessary. Pre-visit ASDAS (OR 4.06, 95% CI 1.80-9.17) and PtGA (OR 1.65, 95% CI 1.25-2.17) were associated with the perceived necessity of visits. Positive predictive value of ASDAS ≥2.1 and PtGA ≥3.0 were 91.7% and 80.0%, respectively.

Conclusion
Traditional physician-initiated follow-up for SpA patients likely results in a suboptimal use of time and resources. Remote disease activity assessments can help identifying patients for whom visits might be necessary from the rheumatologists' perspective.

Arts-onderzoeker categorie

CD4+ and CD8+ T-cell immunity after SARS-CoV-2 vaccination in patients with lymphoid malignancies lacking adequate serological response

Lara S. Boerenkamp (1, 2), Cilia R. Pothast (3), Romy C. Dijkland (3), Kayleigh van Dijk (3), Gwendolyn N.Y. van Gorkom (7), Inge H.M. van Loo (4), Lotte Wieten (5), Constantijn J.M. Halkes (6), Mirjam H.M. Heemskerk (3), Catharina H.M.J. Elssen (2, 7)

1 Internal medicine, div. of hematology, Maastricht University, Maastricht
2 GROW School for Oncology and Reproduction, Maastricht University, Maastricht
3 Experimental hematology, Leiden University Medical Centre, Leiden
4 Medical microbiology, Maastricht University Medical centre, Maastricht
5 Transplantation immunology, Maastricht University Medical Centre, Maastricht
6 Hematology, Leiden University Medical Centre, Leiden
7 Internal medicine, div. of hematology, Maastricht University Medical Centre, Maastricht, Netherlands

Introduction
Vaccination against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been proven to be an effective strategy to prevent severe coronavirus disease 19 (COVID-19) in healthy individuals. This strategy might be less effective in patients with haematological malignancies, due to disease or treatment related immune deficiencies. This study aimed to assess SARS-CoV-2 vaccination efficacy in patients with chronic lymphocytic leukemia (CLL), aggressive and indolent non-Hodgkin lymphoma (NHL) and Multiple Myeloma (MM) by focusing on T-cell immunity.

Methods
Serologic responses were evaluated using Roche Elecsys anti-SARS-CoV-2 S immunoassay. CD4+ and CD8+ T-cell responses were evaluated by a robust and reproducible method of SARS-CoV-2 spike peptide stimulation followed by flow cytometric analysis of T-cell activation and cytokine production. Additionally, SARS-CoV-2-specific CD8+ T-cells were detected using tetramer staining.

Results
Adequate seroconversion rates were 31% (CLL), 62% (aggressive NHL), 60% (indolent NHL) and 93% (MM). SARS-CoV-2-specific CD4+ T-cells were detected in 75%, 92%, 81% and 60% and SARS-CoV-2-specific CD8+ T-cells in 77%, 82%, 71% and 50% of patients respectively. We showed that despite a lack of serological responses after SARS-CoV-2 mRNA vaccination, most patients can generate T-cell responses against SARS-CoV-2 (OR CD4+ 1.45 [0.30-6.91] and OR CD8+ 0.13 [0.72-6.91]). Moreover, patients lacking serological response seem to have higher CD8+ T cell responses, possibly contributing to a survival advantage in case of a COVID-19 infection. Lastly, older age seemed to be an important factor to negatively influence CD4+ and CD8+ T cell responses.

Conclusion
In conclusion, we showed that lymphoid malignancy patients have a diminished serological response rate to SARS-CoV-2 vaccination. However, most patients do show CD4+ and/or CD8+ T cell responses, despite the lack of serological response. Not the disease, but age seems to be the most important factor for diminished T cell responses.

Arts-onderzoeker categorie

Accelerometer-derived physical activity and sedentary time and cardiac biomarkers: the Maastricht Study

E.J. Vandercappellen(1,2,3), A. Koster(3,4), C.J.H. van der Kallen(1,2), N.C. Schaper(1,2,3), H.H.C.M. Savelberg(6,7), S.J.P.M. Eussen(2,8), P.C. Dagnelie(1,2), M.T. Schram(1,2,5,9), M.M.J. van Greevenbroek(1,2), A. Wesselius(7,10), S.J.R. Meex(2,11), J.P. Kooman(1,7), A.A. Kroon(1,2,5), R.M.A. Henry(1,2,5), C.D.A. Stehouwer(1,2)

1. Department of Internal Medicine, Maastricht University Medical Center+, Maastricht, the Netherlands
2. CARIM School for Cardiovascular Diseases, Maastricht University, Maastricht, the Netherlands
3. CAPHRI Care and Public Health Research Institute, Maastricht University, Maastricht, the Netherlands
4. Department of Social Medicine, Maastricht University, Maastricht, the Netherlands
5. Heart and Vascular Center, Maastricht University Medical Center+, Maastricht, the Netherlands
6. Department of Nutrition and Movement Science, Maastricht University, Maastricht, the Netherlands
7. NUTRIM School for Nutrition and Translational Research in Metabolism, Maastricht University, Maastricht, the Netherlands
8. Department of Epidemiology, Maastricht University, Maastricht, the Netherlands
9. MHeNS School for Mental Health and Neuroscience, Maastricht University, Maastricht, the Netherlands
10. Department of Complex Genetics and Epidemiology, Maastricht University, Maastricht, the Netherlands
11. Department of Clinical Chemistry, Central Diagnostic Laboratory, Maastricht University Medical Centre+, Maastricht, The Netherlands.

Introduction
Cardiac troponins and NT-proBNP are biomarkers of cardiac injury that are used clinically in the diagnosis of myocardial infarction and heart failure. Type 2 diabetes (T2D) is associated with chronically elevated cardiac biomarkers, which in turn are associated with adverse outcomes. It is not known whether the amount, types and patterns of physical activity (PA) and sedentary time are associated with cardiac biomarkers. We investigated these relationships in people without and with T2D.

Methods
In the population-based Maastricht Study (n=2370, 51.3% male, 28.3% T2D) we determined cardiac biomarkers (hs-cTnI, hs-cTnT, NT-proBNP). PA and sedentary time were measured by the ActivPAL and divided into quartiles (Quartile 1 (Q1) served as reference). The weekly pattern of moderate-to-vigorous PA and coefficient of variation (CV) was calculated. Linear regression analyses were conducted with adjustment for demographic, lifestyle, and cardiovascular risk factors.

Results
Higher amounts of total PA were associated with lower levels of hs-cTnI (Q2) and hs-cTnT (Q2). Higher levels of light PA were associated with lower levels of hs-cTnI (Q2 and Q3) and higher levels of hs-cTnT (Q4). Additionally, those with the highest levels of vigorous PA had significantly higher levels of hs-cTnI and lower levels of NT-proBNP.
Compared to the least sedentary, those in Q3 had significantly lower levels of hs-cTnI and individuals in Q2 and Q3 had lower levels of hs-cTnT.
With regard to PA patterns, so-called weekend warriors and regularly actives (both groups had ≥150min moderate-to-vigorous PA/week) had lower levels of NT-proBNP but not hs-cTnI and hs-cTnT compared with inactives. A higher weekly moderate-to-vigorous PA CV (indicating more irregular activity) was associated with lower levels of hs-cTnI and higher levels of NT-proBNP, but not with hs-cTnT. Similar associations were found in those with and without T2D.

Conclusion
In general, there is no association between PA and sedentary time and cardiac troponins. In contrast, vigorous PA, especially if done regularly, is associated with lower levels of NT-proBNP. These results suggest that 11 or more minutes per day of vigorous PA may result in less cardiac stress as estimated by NT-pro-BNP, regardless of the presence of type 2 diabetes.

Arts-onderzoeker categorie

Efficacy and safety of a new cochleovestibular implant prototype: the VertiGO! trial

B. Vermorken (1), B. Volpe (1), S. van Boxel (1), E. Loos (1)(2), A. van Soest (1), N. Guinand (1)(3), A. Pérez Fornos (3), V. van Rompaey (4)(5), H. Kingma (1), E. Devocht (1), R. van de Berg (1)

(1) Department of Otorhinolaryngology and Head and Neck Surgery, Division of Balance Disorders, School for Mental Health and Neuroscience (MHENS), Maastricht University Medical Centre, Maastricht, The Netherlands
(2) KU Leuven, University of Leuven, Department of Neurosciences, Research group ExpORL, Leuven, Belgium; & University of hospitals Leuven, Department of Otorhinolaryngology- Head and Neck Surgery
(3) Service of Otorhinolaryngology Head and Neck Surgery, Department of Clinical Neurosciences, Geneva University Hospitals, Geneva, Switzerland
(4) Faculty of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium
(5) Department of Otorhinolaryngology and Head and Neck Surgery, Antwerp University Hospital, Edegem, Belgium

Introduction
Bilateral vestibular function loss is an as-of-yet untreatable disorder causing severe impairment and discomfort. Since 2012 a combined multichannel vestibular implant (VI) and cochlear implant (CI) device, also known as the cochleovestibular implant (CVI), is clinically investigated by the Geneva-Maastricht group. This CVI aims to restore vestibular function in patients suffering from bilateral vestibulopathy (BV). Although recent studies showed that CVI stimulation enables compensatory eye, body and neck movements, the constraints in these acute designs prevent them from creating more general statements over time. Moreover, the clinical relevance of potential CI and VI interactions are not yet studied. The VertiGO! Trial aims to investigate the efficacy and safety of prolonged daily stimulation with a multichannel CVI prototype in a more rigorous setting.

Methods
A single-center clinical trial will be carried out to evaluate prolonged CVI stimulation, assess general safety and explore interactions between the CI and VI. A single-blind randomized controlled cross-over design will be implemented to evaluate the efficacy of different types of stimulation. Furthermore, this study will provide a proof-of-concept for a VI rehabilitation program. A total of eight participants suffering from bilateral vestibular loss and severe sensorineural hearing loss in the ear to implant will be included and followed over a five-year period. After CI-rehabilitation, the VI will be fitted and three periods of prolonged VI stimulation are scheduled. Efficacy will be evaluated by collecting functional (i.e. image stabilization) and more fundamental (i.e. vestibulo-ocular reflexes, self-motion perception) outcomes. Hearing performance with a CVI and patient reported outcomes will be included as well.

Results
From July 2021, participants are included in the VertiGO! Trial. From October 2021, CVI implantation surgeries are performed. Per- and postoperative implant telemetry and vestibulo-oculography images, showing well aligned electrically evoked eye movements, are collected. Together with a more detailed overview of the VertiGO! Trial protocol, these preliminary results will be presented.

Conclusion
The feasibility and safety of restoring vestibular function by making use of prolonged VI stimulation by a multichannel CVI prototype will be assessed by a new rigorous randomized cross-over controlled clinical trial: The VertiGO! Trial.

Arts-onderzoeker categorie

Thorax CT-derived muscle area to better 4C mortality in COVID-19 patients?

S.I.J. van Bakel1, H.A. Gietema2, P.M. Stassen3, H.R. Gosker1, D. Gach, F.H.M. van Osch1, A.M.W.J. Schols1, R.J.H.C.G. Beijers1

1 NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University Medical Centre+, Department of Respiratory Medicine, Maastricht, the Netherlands
2 Department of Radiology and Nuclear Medicine, Maastricht University Medical Center+, the Netherlands
3 Department of Internal Medicine, Division of General Internal Medicine, Section Acute Medicine, Maastricht University Medical Center, Maastricht, The Netherlands.

Introduction
COVID-19 has demonstrated a highly variable disease course, from asymptomatic to severe illness, requiring hospitalization and ICU admission to eventually death. Multiple clinical prediction models have been developed to predict mortality in COVID-19 patients, with the 4C Mortality Score currently being the best performing model. Separately, CT-derived low muscle and high adipose tissue cross sectional areas (CSA) have been demonstrated to predict adverse outcomes in COVID-19 as well.

Aim
To evaluate the predictive value of CT-derived muscle and adipose tissue CSA on in-hospital mortality in COVID-19 and to investigate whether adding these parameters to the 4C Mortality Score improves its predictability.

Methods
This is a retrospective cohort analysis of confirmed COVID-19 patients, who initially presented at the emergency department of one of two participating hospitals during the first wave of the pandemic. Body composition parameters were collected from routinely performed thoracic CT-scans at admission. Pectoralis muscle CSA was manually demarcated based on pre-established thresholds of Hounsfield units at the fourth thoracic vertebra and, when available, skeletal muscle and adipose tissue CSA at the first lumbar vertebra level. Clinical parameters and outcome measures were retrieved from medical records.

Results
Data of 570 patients were analyzed (64.6% male, age 67.7±13.5 years, 18.2% 30-day in-hospital mortality). Patients who deceased within 30 days had significantly lower pectoralis CSA (median(IQR) 32.6(24.4-38.7) vs 35.4(27.2-44.2), p=0.003) and L1 CSA (median(IQR) 83.5(65.6-100.2) vs 88.1(72.2-108.2), p=0.029) than survivors. No significant differences regarding subcutaneous and visceral adipose tissue areas were observed. In multivariate analyses, adjusted for 4C mortality score, both pectoralis (HR 0.98 95%CI(0.96-1.00) p=0.042) and L1 muscle CSA (HR 0.99 95%CI(0.97-1.00) p=0.042) significantly predicted 30-day in-hospital mortality. The forward selection likelihood ratio selected pectoralis muscle CSA as best addition to the 4C Mortality Score. This adjusted score resulted in an improved AUC (from 0.805 95%CI(0.76-0.85) to 0.809 95%CI(0.77-0.85), p=0.579).

Conclusion
Low CT-derived muscle CSA predicts 30-day in-hospital mortality in COVID-19 patients. Even though it does not sufficiently increase the accuracy of the 4C model to be included in the score, estimating muscle mass might aid clinical decision-making when 4C mortality scores are similar between patients.

Arts-onderzoeker categorie

Humoral and cellular immune responses against SARS-CoV-2 during the first two waves of infections in Limburg.

D.A.T. Hanssen (1)(2), K. Arts, N.N.B. Sweelssen (1), W.H.V. Nix (1), T.T.J. Welbers (1), J. Penders (1)(2)(4), D.M.E. Pagen (3), S. Brinkhues (3), C. de Theije, C.J.P.A. Hoebe (2)(3), P.H.M. Savelkoul (1)(2), I.H.M. van Loo (1)(2)

(1) Department of Medical Microbiology, infectious diseases & Infection prevention, Maastricht University Medical Center, the Netherlands
(2) Care and Primary Health Research Institute (CAPHRI), Maastricht University, the Netherlands
(3) Department of Sexual Health, Infectious Diseases and Environmental Health, Public Health Service (GGD) South Limburg, Heerlen, the Netherland
(4) NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University, the Netherlands

Introduction
Seroprevalence studies solely based on qualitative antibody responses might underestimate the extent of immune responses against SARS-CoV-2 in a population. This cross-sectional study determined humoral and cellular immune responses against SARS-CoV-2 in the population of Limburg.

Methods
From October 28th to November 30th, 2020, blood samples and questionnaires were collected from 10.001 inhabitants of Limburg. Total Ig responses were examined. 9634/10.001 participants gave informed consent for further analyses. Samples of seropositive participants were additionally tested with a quantitative antibody test (anti-S-RBD). In a randomly selected subset of samples cellular immune responses were analysed using IFN-γ ELISpot (n=270). Disease severity was categorized as asymptomatic/mild or moderate/severe and was determined for two periods: 6-9 and ≤5 months before sample collection, corresponding to the first and second wave of infection in the Netherlands.

Results
1.948/10.001 (19.5%) of participants tested positive for total Ig. 96.2% (1790/1860) of seropositive participants also tested positive for anti-S-RBD. A longer duration between a positive PCR test and serum collection was a strong predictor for anti-S-RBD responses: OR 3.281 (95% CI 2.472-4.355), p<0.01. Asymptomatic/mild disease or being symptomatic ≤5 months before sample collection were predictive for a negative anti-S-RBD result; OR 3.217 (95% CI 1.591-6.505) and OR 3.214 (95% CI 01.473-7.013), respectively, p<0.01.
In the subset in which cellular responses were analysed, 25.5% (69/270) of participants had a positive ELISpot. Among total Ig positive participants 119/182 (65.4%) had a positive ELISpot, compared to 9/90 (10.0%) of seronegative participants. In the group with a positive ELISpot, the level of the IFN-γ response was not different between seropositive and seronegative participants; median 160 (IQR 100-325) versus 190 spot forming units (s.f.u.) (IQR 103-275), p=0.68. A significant difference was found in IFN-γ levels between asymptomatic/mild (n=26) and moderate/severe symptoms (n=93); median 98 s.f.u. (IQR 75-196) versus 205 s.f.u. (IQR 110-350), p<0.01.

Conclusion
In addition to a seroprevalence of 19.5% a considerable part of seronegative inhabitants (10%) had measurable cellular immune responses. Interestingly, in this cohort more severe disease was associated with higher IFN-γ responses.

Arts-onderzoeker categorie

The Artificial-Intelligence motion study (AIM): AI-assisted image recognition of cervical spine motion.

Valérie Schuermans (1,2.3), Sara El-Ateif (4), Soroosh Poorgholi (4), Paul Algra (5), Henk van Santbrink(1,2,3), Toon Boselie(1,2.3)

1. Department of Neurosurgery, Maastricht University Medical Center +, Maastricht
2. Department of Neurosurgery, Zuyderland Medical Center, Heerlen & Sittard
3. CAPHRI, Care and Public Health Research Institute, Maastricht
4. FruitPunch AI, AI engingeering challenge team, Technical University Eindhoven, EIndhoven
5. Department of Radiology, Noordwest Ziekenhuisgroep, Alkmaar

Introduction
Analyzing motion in the spine remains a challenge. Spinal motion is commonly analysed through segmental range of motion (sROM). However, this method shows high intra- and inter-individual variability. In a previous study by our group, motion patterns in radiographic recordings were investigated. Contours of the occiput (C0) and cervical vertebrae (C1-C7) were manually drawn and corrected on separate frames of the recordings, which is very labor-intensive. The present study uses the annotated data develop artificial intelligence (AI) - assisted segmentation models to recognize and track cervical vertebrae.

Methods
Radiographic flexion-extension recordings of healthy volunteers and pre-operative patients with degenerative disc disease were used. C0-C7 were manually annotated in all frames of the recordings.
To achieve the localisation of vertebrae across multiple frames, two segmentation approaches were developed using ResUnet++ network and Mask-RCNN. Finally, both methods were combined in an optimal algorithm. The model was trained on 2025 images and validated in 176 images for C0-C7.

Results
The AI-model almost exactly identifies cervical vertebral contours in images that have not been 'seen' by the algorithm before. Intersection over union (IOU) was measured to compare the ground truth with the AI-predicted contour, and proved of high accuracy in all recordings. Consistency of a specific contour throughout the individual recordings was measured through the mean IOU of consecutive frames, for the ground truth and AI-prediction separately. The consistency of contours throughout recordings was highly comparable between human annotation and AI prediction.

Conclusion
The developed AI-model enables time-efficient and accurate segmentation of C0-C7. Moreover, human experience and training is not required. The accessibility of this method allows extensive analysis of spinal motion, of which in depth knowledge is currently still lacking. We are currently developing a method to calculate motion patterns based on the segmented cervical vertebrae. The next steps will be to validate the model with recordings of patients with anatomical variants or implants in-situ. Ultimately, the aim is to investigate the relationship between motion of the cervical spine and the development of pathology.

Arts-onderzoeker categorie

Lower limb muscle fatigue after uphill walking in children with unilateral spastic cerebral palsy

I. Moll, MD (1,2,3), J.M.N. Essers (2), R.G.J. Marcellis, PT, PhD (4), R.H.J. Senden, PhD (4), Y. J.M. Janssen-Potten (5,6), R.J. Vermeulen, MD, professor (1,3), K. Meijer, associate professor (2)

1. School of Mental Health and Neurosciences (MHeNs), Faculty of Health, Medicine and Life Sciences (FHML), Maastricht University, Maastricht, the Netherlands.
2. Department of Nutrition and Movement Sciences, FHML, School of Nutrition and Translational Research in Metabolism (NUTRIM), Maastricht University, Maastricht, the Netherlands.
3. Department of Neurology, Maastricht University Medical Center (MUMC+), Maastricht, the Netherlands.
4. Department of Physiotherapy, MUMC+, Maastricht, the Netherlands.
5. Adelante Centre of Expertise in Rehabilitation and Audiology, Hoensbroek, the Netherlands.
6. Research School CAPHRI, Department of Rehabilitation Medicine, Maastricht University, Maastricht, the Netherlands

Introduction
Fatigue during walking is a common complaint in cerebral palsy (CP). The primary purpose of this study is to investigate muscle fatigue from surface electromyography (sEMG) measurements after a treadmill-based fatigue protocol with increasing incline and speed in CP patients with drop foot. The secondary purpose is to investigate whether changes in sagittal kinematics of hip, knee and ankle occur after fatigue.

Methods
Eighteen subjects with unilateral spastic CP performed the protocol while wearing their ankle-foot orthosis and scored their fatigue on the OMNI scale of perceived exertion. The median frequency (MF) and root mean square (RMS) were used as sEMG measures for fatigue and linear mixed effects model were applied.

Results
The MF was significantly decreased in fatigued condition, especially in the affected leg and in the tibialis anterior and peroneus longus muscle. The RMS did not change significantly in fatigued condition, while the OMNI fatigue score indicated patients felt really fatigued. No changes in sagittal kinematics of hip, knee and ankle were found using statistical non-parametric mapping.

Conclusion
In conclusion, the current fatigue protocol seems promising in inducing fatigue in a CP population with drop foot and it could be used to expand knowledge on muscle fatigue during walking in CP.

Arts-onderzoeker categorie

Pressure Masks For Facial Scars Treatment After Oncological Reconstruction: Long-Term Patient Satisfaction and Quality of Life

M. De Henau(1,2), MD, S.M.J. van Kuijk, PhD(3), C. Colla(1), E. Van den Kerckhove, PhD(1,4,5) , R.R.W.J. Van der Hulst, MD, PhD(1) A. Piatkowski, MD, PhD(1,6)

1 Maastricht University Medical Center, Maastricht, The Netherlands
2 GROW school of Oncology and Reproduction, Maastricht University, the Netherlands
3 Department of Clinical Epidemiology and Medical Technology Assessment (KEMTA), Maastricht University Medical Center, Maastricht, The Netherlands.
4 KU Leuven, Department of Rehabilitation Sciences, Faber, Universitaire Ziekenhuizen Leuven, Leuven, Belgium
5 Department of Physical Medicine and Rehabilitation and Burns Center, Universitaire Ziekenhuizen Leuven, Leuven, Belgium
6 Department of Plastic Surgery, VieCuri Medical Centrum, Venlo, the Netherlands

Introduction
With increasing incidence of facial skin cancer, more patients undergo facial reconstruction following Mohs micrographic surgery (MMS). Aesthetically unpleasing, thickened facial flaps and disturbing scars can be treated with a pressure mask with inner silicone lining to help improve functional and aesthetic outcomes. However, data on long-term patient satisfaction and quality of life (QoL) following this treatment are lacking.

Methods
We aimed to assess long-term satisfaction and QoL of patients who underwent local flap reconstruction following MMS. Patients treated between January 2012 and October 2020 were invited to answer FACE-Q and SCAR-Q questionnaires. Demographic data, skin cancer type and location, type of reconstruction, post-operative complications, duration of pressure mask therapy, daily compliance, and additional scar treatment were collected to explore possible predictors.

Results
Of ninety-two eligible patients, fifty responded. Eighteen respondents were male (36 %) and 32 were female (64 %). Mean duration of pressure mask therapy was 10.20 ± 4.61 months. Patients were 61.14 ± 32.91 months after completion of pressure mask therapy upon participation. Patients whose reconstruction consisted of multiple flaps had significantly worse outcomes in social function (p=0.012), scar appearance (p=0.045), and scar symptoms (p=0.008). A trend of increasing time since therapy completion predicting better outcomes was observed for all scales, and it was a significant predictor for better scar appearance (p=0.001) and less scar symptoms (p=0.001).

Conclusion
Pressure mask treatment for facial flaps and scars following MMS results in good long-term patient satisfaction and QoL. Multiple local flaps, reflecting a larger skin defect post-excision, is a predictor for worse outcomes in social function, scar appearance and symptoms. Increasing time is associated with increasing satisfaction, which reflects satisfactory and stable long-term effects of treatment, possibly combined with more acceptance of the result over time.

Semi-arts categorie

Predictive biomarkers for peritoneal metastases in colorectal cancer

D.J.I. Heuvelings B.Sc.(1), A.G.W.E Wintjens M.D., M.Sc.(2), L. Moonen M.D. (3), I.H. de Hingh M.D., Ph.D. (4), L.P.S. Stassen M.D., Ph.D. (4), S.M.E. Engelen M.D., Ph.D. (4), M. den Dulk M.D., Ph.D. (1, 7) D. Keszthelyi M.D., Ph.D. (5), Z. Mujagic M.D., Ph.D. (5) Valkenburg – van Iersel M.D., Ph.D (6), E.J.M. Speel M.D., Ph.D. (3), N.D. Bouvy M.D., Ph.D.(1) *
*Authors and their places are not definitive. Only the two first authors and last one are definitive.

(1) Department of General Surgery, Maastricht University Medical Center (MUMC+), Maastricht, The Netherlands.
(2) NUTRIM School of Nutrition and Translational Research in Metabolism, Maastricht University, Maastricht, The Netherlands.
(3) Department of Pathology, Maastricht University Medical Center (MUMC+), Maastricht, The Netherlands
(4) Department of General Surgery, Catharina Ziekenhuis, Eindhoven, The Netherlands.
(5) Department of Gastroenterology and Hepatology, Maastricht University Medical Center (MUMC+), Maastricht, The Netherlands
(6) Department Oncology, Maastricht University Medical Center, Maastricht, The Netherlands
(7) Department of Surgery and Transplantation, University Hospital RWTH Aachen, Aachen, Germany

Introduction
Colorectal cancer (CRC) is the fourth most prevalent type of cancer and a common cause of morbidity and mortality, which is generally attributable to metastatic disease. Besides liver metastases, peritoneal metastases are the second most often manifestation of metastatic colorectal cancer CRC. The occurrence of peritoneal metastasis (PM) is a highly underestimated disease. Without treatment, the average life-expectancy is six months to one year after receiving the diagnosis. Developing new treatments as well as searching ways to accomplish prevention of colorectal PM is therefore an important focus of clinical research. Metastasis-specific markers in the primary tumor are hopeful to help predict the spread of tumor cells and apply treatments in a preventive setting. In the light of growing evidence and knowledge of colorectal PM biomarkers, this study aims to gain more insight into predictive biomarkers for peritoneal metastases.

Methods
A total of 39 patients with T3 stage colorectal cancer were retrospectively collected as study objects and divided in three groups: without metachronous metastases (n=20), with metachronous liver metastases (n=10) and with metachronous peritoneal metastases (n=9). Primary Formalin-Fixed Paraffin-Embedded tumor samples from all patients were analyzed through next-generation sequencing assay to assess DNA mutated regions of 523 genes and RNA mutated regions of 55 genes.

Results
For RNA sequencing, no slice variants were observed in all samples. A total of four samples, from who two in the PM group, showed fusions, without significant correlation.
DNA sequencing revealed multiple pathogenic mutations in all samples. Both metastases' groups showed a significant higher number of mutations compared to the M0 group. Further analysis the significance of specific DNA mutations in peritoneal samples will follow.*

Conclusion
Although it is hypothesized that metastasis-specific biomarkers identified in the primary tumor might be used as a prediction tool of the risk of distant metastatic spread, the authors did not identify biomarkers on RNA level through next-generation sequencing assay. Analysis on DNA level mutations might reveal potential biomarker for peritoneal metastases in colorectal cancer.*

*DNA mutation analysis will be finished to present at time of the symposium.

Semi-arts categorie

Discharge process optimization

Anke Rompelberg (1), Bart Scheenstra (2,3), Dewi Winters (1)

1. Maastricht University, Maastricht, Netherlands
2. Department of Cardiothoracic Surgery, Heart and Vascular Centre, Maastricht University Medical Centre, Maastricht, Netherlands
3. Cardiovascular Research Institute Maastricht, Maastricht University, Maastricht, Netherlands

Introduction
Hospitals have to deal with a limited bed capacity. The limited capacity urges hospitals to discharge patients as soon as possible after surgery to prevent patient flow issues, and for an optimal recovery and rehabilitation for the patient. However, patients often cannot be discharged to an appropriate location, because of a lack of capacity in follow-up services, resulting in a prolonged hospitalization. A prolonged hospitalization can for example leads to, amongst others: patient flow issues and poor patient and family experiences. Our study aims to prevent prolonged hospitalization in cardiothoracic surgery (CTS) patients by identifying discharge problems pre-operatively using a questionnaire that allows us to assess the patient's home situation and utilize an intervention carried out by nurses specialized in the hospital discharge process (the discharge agency).

Methods
During the pre-operative CTS outpatient clinic, a questionnaire was administered with four questions that screened for possible discharge problems based on the patient's home situation, and informal caregivers. Patients with a positive screening for discharge problems were randomized into a control and intervention group. Patients in the intervention group were contacted for a pre-operative assessment with the discharge agency. The control group did not have an assessment pre-operatively. We evaluated the effectiveness of the intervention in days of hospitalization in the intervention group, control group, and group with a normal screening.

Results
The discharge agency was significantly more often asked for consultation in the case of positive screening than in normal screening (normal screening 7.6%, control group 31.7%, intervention group 36.5%, p=.000). The timing of discharge agency consultation was significantly earlier (p=.002) in the control and intervention groups (median=1 day) than the normal screening group (median=5 days). The mean hospitalization days did not differ between groups (normal screening group: 5.9 days, intervention group: 6.1 days, control group: 5.1 days, p=.571).

Conclusion
Although patients with a positive screening are older and have directions for a prolonged hospitalization they do not have a prolonged hospitalization compared to patients with a normal screening. This might be the result of our intervention, though more research has to be done to confirm this observation.

Semi-arts categorie

Assessment of the pathophysioLogical bAsis of local tissue compliaNce using augmenteD iMAging techniques to identify Regional flow dynamiCs (LANDMARC): a study with focus on aorta ascendens and right atrium

Walle van de SML (1), Schurgers L (3), Wildberger JE (2), Maessen JG (1), Mihl C (2), Bidar E (1)

1) Department of Cardiothoracic Surgery, MUMC+
2) Department of Radiology and Nuclear Medicine, MUMC+
3) Maastricht University Department of Biochemistry

Introduction
Aortic diameter has proven to be insufficiently accurate for making decisions about well-timed preventive interventions. Over 90% of the population fails to meet the guidelines for elective (ascending) replacement and a majority presents themselves with aortic dissection and ruptures with diameters below surgical thresholds. Additional data is required, and new parameters need to be developed to detect aorta pathology more adequately in an early phase. Earlier research within the MUMC+ has confirmed that increase in (ascending) aortic length is an adequate predictor for aortic pathology, based on powerful pulsating forces within this aorta leading to degradation of elastin fibers and structural remodeling. Therefore, cardiovascular tissue response and cell interaction, based on dynamic body processes and hemodynamics, are important factors in the development of cardiovascular disease.
Current imaging techniques are of limited use for detecting these new predictors of cardiovascular disease, due to low temporal/spatial resolution and strong dependence on anatomical landmarks. The LANDMARC-study is based on improvement of applicability of existing imaging techniques, so that dynamic processes within the body can be correlated to (patho-)physiological changes. By adding additional aortic and atrial landmarks during cardiac surgery, 3D/4D imaging techniques can be used to determine quantified tissue changes more precisely per reduced anatomical segment. These can then be correlated to underlying stimuli that trigger tissue remodeling. Biobank research will provide additional information about subclinical changes and biomarkers.

Methods
The LANDMARC study is a single-center prospective cohort study, which will take place within the Departments of Cardiothoracic Surgery, Radiology and Nuclear Medicine, and Cardiology in the MUMC+. Primary outcome is the correlation between (4D-flow variable) wall shear stress and local wall deformation (strain). Secondary outcome is the correlation between (4D-flow variable) wall shear stress and degree of cardiovascular tissue fibrosis.

Results
The study population will consist of 100 patients. The first 10 inclusions will be analyzed as part of the WESP internship.

Conclusion
The LANDMARC study will provide more accurate information for future risk stratification models to predict cardiovascular pathology. Using these models, patients at risk can be identified, so that treatment can take place before a disease manifests itself in clinical setting.

Semi-arts categorie

Donor Site Satisfaction Following Autologous Fat Transfer for Total Breast Reconstruction

Jamilla L M Wederfoort [1], Esther van Santbrink [2], Juliette E Hommes [1], Esther M Heuts [3], Sander M J Van Kuijk [4], René R W J van der Hulst [1], Andrzej Piatkowski [5]

1. Department of Plastic, Reconstructive, and Hand Surgery, Maastricht University Medical Center+, Maastricht, the Netherlands.
2. Faculty of Health, Medicine, and Life Sciences, Maastricht University, Maastricht, the Netherlands.
3. Department of Surgery, Maastricht University Medical Center+, Maastricht, the Netherlands.
4. Department of Clinical Epidemiology and Medical Technology Assessment (KEMTA), Maastricht University Medical Center, Maastricht, the Netherlands.
5. Department of Plastic, Reconstructive, and Hand Surgery, VieCuri Medical Center, Venlo, the Netherlands.

Introduction
With evolving breast cancer survival and patient preferences, it is essential that reconstructive surgeons worldwide keep searching for the best reconstruction technique for patients. Autologous fat transfer (AFT) is a relatively new technique for total breast reconstruction that has already proven to be effective and safe with all advantages of autologous tissue. However, little is known about aesthetic results and satisfaction concerning donor sites.
Objectives: The aim of this study was to measure donor site satisfaction following AFT for total breast reconstruction in breast cancer patients.

Methods
Between May and August of 2021, participants of the BREAST-trial who were at least 24 months after their final reconstruction surgery were invited to fill out an additional survey concerning donor sites. The BODY-Q was utilized for data collection. Results of AFT patients were compared to a control group: implant-based reconstruction (IBR) patients who do not have a donor site.

Results
A total of 51 patients (20 control, 31 intervention) completed the questionnaire. No statistical differences in satisfaction with body were found between these groups. The most frequent complaint was contour irregularities (31 reports, 60.8%) with the least favorable donor site being thighs (23 reports, 53.5%) in the AFT group.

Conclusion
There is no difference in satisfaction with body between breast cancer patients receiving AFT or IBR, meaning that large volume liposuction does not aesthetically affect the utilized donor site. Nevertheless, reconstructive surgeons should be aware of possible donor site complications, especially contour irregularities at the thighs, and discuss this with their patients.

Semi-arts categorie

Echocardiographic abnormalities in the Maastricht Intensive Care Covid-19 cohort: a prospective cohort study

Nick Wilmes (1), Bas CT van Bussel (1, 2), Jan-Willem E M Sels (1, 3), Zafer Geyik (1, 3), Thijs S R Delnoij (1, 3), Chahinda Ghossein-Doha (1, 3), Frank van Rosmalen (1, 4, 5), Walther NKA van Mook (1), Iwan CC van der Horst (1, 5), Rob GH Driessen (1, 3)

1) Department of Intensive Care, Maastricht University Medical Center+, Maastricht, The Netherlands
2) Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, The Netherlands
3) Department of Cardiology, Maastricht University Medical Center+, Maastricht, The Netherlands
4) Department of Biomedical Engineering, Maastricht University, Maastricht, The Netherlands
5) Cardiovascular Research Institute Maastricht (CARIM), Maastricht University, Maastricht, The Netherlands

Introduction
COVID-19 has caused adverse health effects for millions worldwide. The infection affects not only the respiratory system but also the cardiovascular system, with myocardial injury due to myocarditis, myocardial ischemia, and worsening of pre-existing myocardial disease as potential sequelae. Unfortunately, few studies have addressed echocardiographic findings in mechanically ventilated COVID-19 patients.

Methods
Within the MaastrICCht cohort the echocardiography sub cohort was defined and used to investigate what proportion of mechanically ventilated patients underwent echocardiography. Secondly, we investigated whether baseline characteristics and cardiac biomarkers (hs-cTnT and NT-proBNP) at intubation differed between patients who underwent echocardiography and those who did not. Finally, the frequency of abnormalities in echocardiographic parameters (left and right ventricular dysfunction, diastolic dysfunction, increased right ventricular pressure, pericardial effusion) and its relation to the cardiac biomarkers was studied. Biomarkers were log-transformed because of non-normality.

Results
Between March 2020 and February 2022, 324 patients (237 males (73%)) were included, with a mean age of 63 ±11 years. 143 (44%) patients underwent echocardiography. Patients who underwent echocardiography had a higher APACHE II score (16 ±6 vs. 14 ±5, p<0.001), longer stay in the ICU (21 ±18 vs. 16 ±13 days, p=0.001), higher ICU mortality (53.1% vs. 38.5% patients, p<0.001), higher log-hs-cTnT at intubation (1.47 ±0.59 vs. 1.18 ±0.39, p<0.001), and higher log-NT-proBNP at intubation (2.10 ±0.70 vs. 1.72 ±0.58, p<0.001). Log-hs-cTnT and log-NT-proBNP measured on the day of echocardiography did not differ between groups. A LVEF <50% was found in 21.6% of patients, 19.2% had RV dysfunction, 57.1% had a heightened RVSP, 59.3% had diastolic dysfunction and in 13% pericardial effusion was present. Patients with reduced EF (<40%) had a higher log-NT-proBNP at intubation in comparison to patients with normal EF (2.70 ±0.67 vs. 2.05 ±0.66, p=0.045).

Conclusion
44% of mechanically ventilated COVID-19 patients underwent echocardiography during ICU admission. Echocardiographic abnormalities were common and detected in 60% of these patients. In addition, patients who received echocardiography had higher cardiac biomarkers and mortality than those who did not. Implementation of routine echocardiography during admission for COVID-19 patients may be recommended.