NEDERLANDSE **TRANSPLANTATIE** VERENIGING

BOOTCONGRES 2024

Wetenschappelijke voorjaarsvergadering
Nederlandse Transplantatie Vereniging

6 en 7 maart 2024
Tivoli Vredenburg te Utrecht

georganiseerd in samenwerking met
Transplantatiecentrum UMC Utrecht

UMC Utrecht

Inhoudsopgave

Welkomstwoord : Samen gaan we voor Goud!

Welkom op het Bootcongres in Utrecht! Wij zijn er trots op u te mogen ontvangen in Tivoli Vredenburg. Een unieke locatie in het hart van onze stad, bekend om zijn rijke historie als (inter)nationaal muziekcentrum. Na een jarenlange verbouwing is TivoliVredenburg in 2014 heropend en sindsdien hebben alweer vele legendarische pop acts en bands de diverse zalen plat gespeeld. Een prachtig podium om met elkaar de nieuwste ontwikkelingen op ons vakgebied met elkaar te delen.

Het Lokaal Organiserend Comité heeft dit jaar gekozen voor het thema Goud! Hierbij staat Goud! voor de gouden prestatie en de gouden samenwerking die elke orgaantransplantatie nodig heeft om tot de beste uitkomst te komen. Als professionals in dit veld zijn we daarbij altijd bezig om het maximale resultaat te behalen met de middelen die voorhanden zijn. Hoe kunnen we de donorpool vergroten, hoe kunnen we donororganen optimaliseren en het beste preserveren? Welke vorm van immuun suppressie geeft de beste balans om rejectie tegen te gaan en infectieuze complicaties te voorkomen? Hoe zorgen we ervoor dat onze patiënten fit genoeg zijn voor het ondergaan van een transplantatie, dat zij na een transplantatie optimaal revalideren en weer onderdeel kunnen zijn van de maatschappij?

Een orgaantransplantatie is bij uitstek een multidisciplinair traject waarbij zeer veel verschillende zorgprofessionals betrokken zijn en iedereen goed op elkaar ingespeeld moet zijn. Daarbij is goed wetenschappelijk onderzoek essentieel voor de dagelijkse praktijk en de basis om ons vakgebied verder te blijven ontwikkelen.

We hebben voor dit Bootcongres ons best gedaan een divers programma te ontwikkelen en geven u hierbij vast een vooruitblik naar een aantal onderwerpen die de revue zullen passeren. Zo zullen we tijdens dit congres kijken naar de toekomst en de uitdagingen die er liggen om in tijden van schaarste in mensen en middelen optimale zorg te kunnen blijven bieden en met elkaar spreken over nieuwe kansen op het gebied van digitalisering en artificial intelligence.

Onze nieuwste collega's in het veld, de Orgaanperfusie en Transplantatie Coördinatoren (OPTC 's), geven een inkijk hoe zij hun functie het afgelopen jaar hebben ontwikkeld en zullen met hun frisse blik bespreken welke kansen er liggen voor de toekomst. Naast jong en nieuw zullen we ook horen over de impact van senescence en vooruitkijken naar de inspirerende mogelijkheden van regeneratieve geneeskunde bij het voorkomen van eindorgaanschade alsmede de inzet bij orgaantransplantatie.

Tot slot hebben we dit jaar een extra feestje met elkaar te vieren; de Nederlandse Transplantatievereniging (NTV) bestaat 35 jaar! Een prachtige mijlpaal waar we graag het glas op willen heffen met u allen.

We zien er naar uit u te ontmoeten en er met elkaar gouden dagen van te maken, veel plezier op het Bootcongres 2024 in Utrecht!

Namens het Lokaal Organiserend Comité,

Elize Berg en Femke Molenaar

Organisatiecommissie Bootcongres 2024

Vanuit het Universitair Medisch Centrum Utrecht:
- Elize Berg
- Mareille Fluitman
- Anja Kooistra
- Bart Luijk
- Femke Molenaar
- Annemieke Nagtegaal
- Marish Oerlemans
- Astrid Snijders
- Eric Spierings
- Raechel Toorop
- Marion Wessels- Bakker
- Arjan van Zuilen

Bestuursleden Nederlandse Transplantatie Vereniging:
- Niels van der Kaaij, voorzitter
- Arnold van der Meer, penningmeester
- Dorottya de Vries, secretaris
- Marleen van Buren
- Sarwa Darwish Murad
- Sebastiaan Heidt
- Jan-Stephan Sanders

Accreditatie:

Er is bij de volgende verenigingen accreditatie aangevraagd:

- Nederlandse Vereniging voor Heelkunde
- Nederlandse Vereniging voor Immunologie
- Nederlandse Internisten Vereniging
- Nederlandse Vereniging voor Kindergeneeskunde
- Nederlandse Vereniging van Artsen voor Longziekten en Tuberculose
- Nederlandse Vereniging van Maag-Darm-Leverartsen
- Nederlandse Vereniging voor Thoraxchirurgie
- Nederlandse Vereniging voor Urologie

- V&VN, kwaliteitsregister algemeen
- V&VN, kwaliteitsregister, deskundigheidsgebied Dialyse
- V&VN, verpleegkundig specialisten register
- Nederlandse Associatie van Physician Assistants

Locatie:

TivoliVredenburg
Vredenburgkade 11
3511 WC Utrecht
www.tivolivredenburg.nl

Open WiFi netwerk: TivoliVredenburg

Bereikbaarheid met openbaar vervoer

TivoliVredenburg is makkelijk te bereiken met het openbaar vervoer. De locatie ligt op circa 5 min. loopafstand van Utrecht Centraal en Hoog Catharijne.

De dichtstbijzijnde bushaltes zijn:
- Vredenburg, direct naast TivoliVredenburg
- Utrecht Centraal Station, Centrumzijde, op 5 minuten loopafstand.
- Sint Jacobsstraat, op enkele minuten loopafstand
- Neude, op 5 minuten loopafstand

Bereikbaarheid met de auto

Indien u met een navigatiesysteem TivoliVredenburg wilt bereiken, voert u dan als adres in: 'Vredenburgkade 11, 3511 WC Utrecht'.
Let op: in het centrum/stationsgebied en rondom TivoliVredenburg, werkt navigatie niet altijd goed. We raden u aan om de navigatie uit te zetten en de borden te volgen.

Parkeermogelijkheden

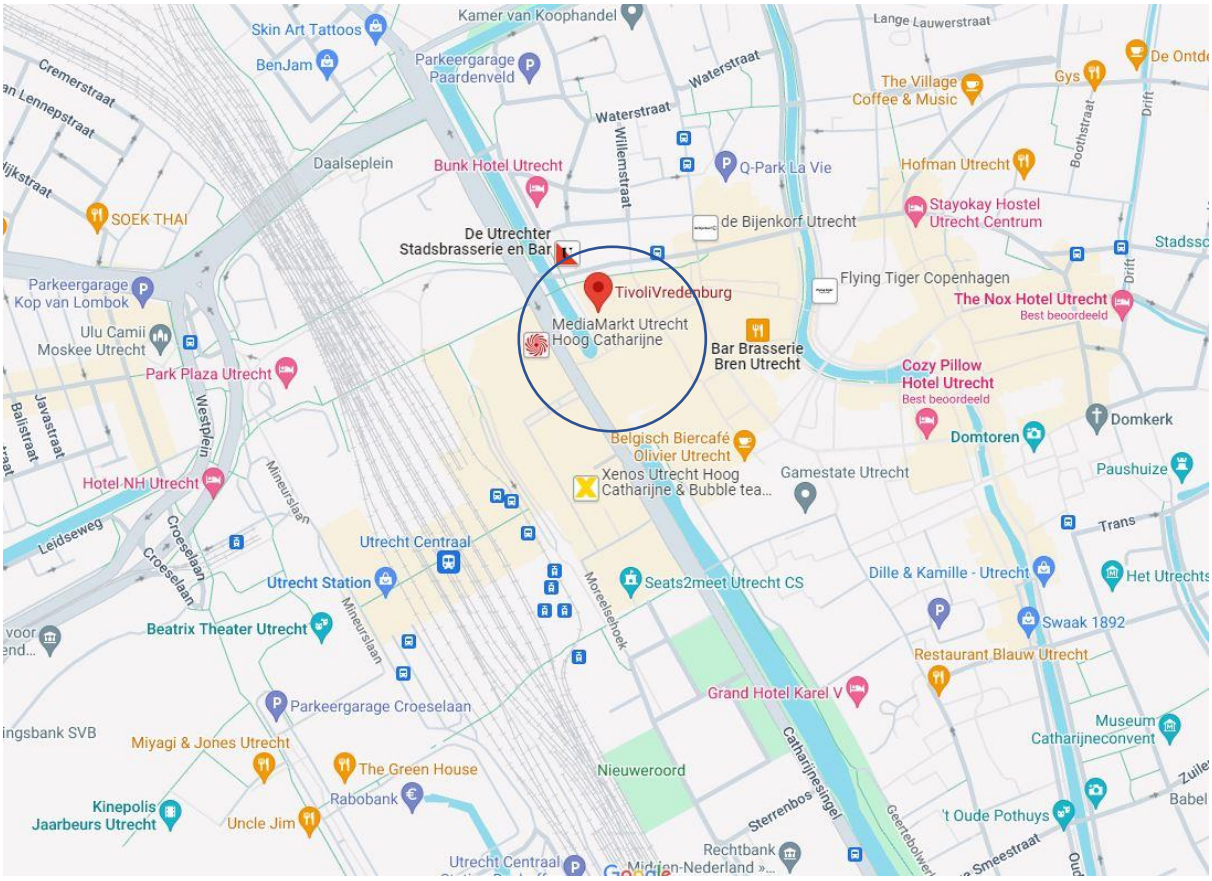
In de directe omgeving van TivoliVredenburg kunt u parkeren in een van de verschillende parkeergarages van Hoog Catharijne (P1 t/m P6). Daarnaast bevinden zich nog een aantal andere parkeergarages op loopafstand (Paardenveld, Bijenkorf/LaVie en Springweg).

Plattegrond Tivoli

De sessies van het Bootcongres vinden plaats in een drietal zalen: de plenaire zaal (Hertz) en de subzalen Cloud Nine en Club Nine. Jassen en eventuele koffers kunt u in bewaring geven bij de garderobe op de begane grond. De registratie op de eerste congresdag vindt eveneens plaats op de begane grond.
Na registratie neemt u twee roltrappen naar de verdieping waar u in Park 6 wordt ontvangen met koffie. Sprekers kunnen hun presentatie inleveren in de naastgelegen ruimte (de Punt), dit wordt ter plaatse aangegeven.

Hertz, plenaire zaal

Stadsplan Utrecht



Inleveren presentaties

Wij verzoeken sprekers indien mogelijk de presentatie (PowerPoint, beeldverhouding 16:9) uiterlijk ***maandag 4 maart a.s.*** aan te leveren via congres@transplantatievereniging.nl. Wij kunnen er zo voor zorgen dat de presentatie voor aanvang van de sessie op de laptop in de zaal klaarstaat.
Voor de zekerheid of i.v.m. eventuele wijzigingen kunnen sprekers de presentatie ook nog op USB- stick meenemen. Deze kan tot ***uiterlijk 45 minuten*** voor aanvang van de presentatie ingeleverd worden bij de AV-studenten in de hiertoe ter plaatse aangewezen zaal 'De Punt'; deze ruimte wordt ter plaatse aangegeven d.m.v. bewegwijzering.

Posters

De posters graag ophangen op de aangewezen plaatsen in de verdiepte ruimte die grenst aan Park 6. Daar staan (genummerde) posterborden gereed, materiaal om de posters te bevestigen is aanwezig. Deelnemers worden verzocht de posters pas te verwijderen na de laatste pauze op donderdag.

Tijdstip van de maaltijden

Woensdag

Lunch, Park 6	12.00 – 13.00 uur
Diner en avondprogramma, Cloud Nine	19.30 – 00.30 uur

Donderdag

Lunch, Park 6	12.35 – 13.30 uur

Sponsoren NTV

Schematisch overzicht programma woensdag 6 maart

Woensdag 6 maart | ochtend	Programmaonderdeel	Locatie TivoliVredenburg
09.30-10.00	Registratie	Centrale hal
09.30-10.00	Ontvangst met koffie	Park 6
10.00-10.10	**Plenaire sessie I** **De toekomst van de transplantatie zorg, op weg naar Goud!** *Voorzitter:* *dr. Niels van der Kaaij cardiothoracaal chirurg, voorzitter NTV, UMC Utrecht* *drs. Femke Molenaar internist- nefroloog UMC Utrecht* Opening congres en introductie van het programma *drs. Femke Molenaar, voorzitter LOC*	Hertz
10.10-10.35	Toekomst van de (transplantatie)zorg. *Michel van Schaik, directeur Gezondheidszorg Rabobank*	Hertz
10.35-11.00	AI en digital health: het ziekenhuis van de toekomst. *dr. Teus Kappen, Anesthesioloog UMCU Utrecht*	Hertz
11.00-11.30	De weg naar een Gouden prestatie. *Peter van Maurik, Stichting Sport en Transplantatie*	Hertz
11.30-12.00	Gemodereerde postersessie	K.F. Hein Foyer
12.00-13.00	Lunch	Park 6

Woensdag 6 maart | middag	Programmaonderdeel	Locatie TivoliVredenburg
13.00-13.45	**Plenaire sessie II** **Prijsuitreiking Chiesi en Astellas** *Voorzitter: Niels van der Kaaij, cardiothoracaal chirurg, voorzitter NTV, UMC Utrecht* Pitches Chiesi prijs 2024 - Beste idee in Transplantatie Astellas Transplantatie Research prijs 2024 Voordracht winnaar Astellas prijs 2023 *Chimeric HLA Antibody Receptor (CHAR) T cell engineering – a new approach to target HLA sensitization'* *drs. Ilse Gille en dr. Sebastiaan Heidt, LUMC*	Hertz
13.50-15.10	**Parallelsessie I: Transplantation outcome** *Voorzitter: dr. Marije Baas en dr. Raechel Toorop*	Hertz
13.50-15.10	**Parallelsessie II: LWTZ** *Voorzitter: Monique Mullens en Marion Wessels*	Cloud nine
13.50-15.10	**Parallelsessie III: Basic immunology** *Voorzitter: dr. Eric Spierings en dr. Karin Boer*	Club nine
15.10-15.40	Koffiepauze	Park 6
15.40-17.00	**Parallelsessie IV: Machine perfusion** *Voorzitter: prof. dr Henri Leuvenink en dr. Sue Braithwaite*	Hertz
15.40-17.00	**Parallelsessie V: ODC** *Voorzitter: Hanne Verberght, Astrid Snijders*	Cloud nine
15.40-17.00	**Parallelsessie VI: Heart-Lung transplantation** *Voorzitter: dr. Marish Oerlemans en dr. Michiel Erasmus*	Club nine
17.00	Algemene ledenvergadering	Hertz
19.30-21.00	Aanvang avondprogramma Ontvangst met welkomstdrankje in kader van 35 jaar NTV Walking dinner	Cloud nine
21.00	Aanvang feestavond	Cloud nine

Schematisch overzicht programma donderdag 7 maart

Donderdag 7 maart | ochtend	Programmaonderdeel	Locatie TivoliVredenburg
08.30-09.00	Registratie	Centrale hal
08.30-09.00	Ontvangst met koffie	Park 6
09.00-09.05	**Plenaire sessie III** *Voorzitter: drs. Elize Berg, transplantatie longarts UMC Utrecht en dr. Sebastiaan Heidt, NTV-bestuurslid* Opening en introductie van het vervolgprogramma	Hertz
09.05-09.25	Afstoting anders belicht: Een hoofdrol voor T-cel epitopen *dr. Eric Spierings, medisch immunoloog UMC Utrecht*	Hertz
09.25-09.45	Het korte telomeersyndroom en longtransplantatie *dr. Coline van Moorsel, Hoofd ILD research en ontwikkeling longziekten binnen het ILD centrum van St Antonius Ziekenhuis Nieuwegein*	Hertz
09.45-10.00	OPTC: kennismaking met een nieuwe functie en kansen voor de toekomst *drs. Jitte Jennekens, orgaanperfusionist/ transplantatie coördinator en drs Emmelien Hazenkamp, orgaanperfusionist/ transplantatie coördinator UMC Utrecht*	Hertz
10.05-10.45	**Prijsuitreikingen 2024** *Uitreikingen worden verricht door: dr. M. C. van Buren, NTV-bestuurslid* **Presentatie winnaar Innovatie in Transplantatie Onderwijs NTV 2023** Project Patiënten educatie – Leven na een transplantatie *dr. M.C. van Buren, verpleegkundig specialist, Erasmus MC* **Presentatie winnaar LWTZ innovatie- kwaliteitsprijs 2023** Project innovatieve Medicatie training box na transplantatie (MediT-box) *Sprekers Mevr. M.N. Houthoff & mevr. M.D. van der Zanden, Erasmus MC*	Hertz

	Presentatie winnaar wetenschapsprijs NTV 2023 dr. G.E. Karahan, postdoc immunologie LUMC **Uitreiking Jon J. van Rood prijs 2024** **Presentatie winnaar Jon J. van Rood prijs 2024** **Uitreiking NTV wetenschapsprijs 2024**	
10.45-11.15	Koffiepauze	Park 6
11.15-12.35	**Parallelsessie VII: Immunology clinical** *Voorzitter: dr. Kirsten Geneugelijk en dr. Sebastiaan Heidt*	Hertz
11.15-12.35	**Parallelsessie VIII: Kidney clinical** *Voorzitter: dr. Martijn van den Hoogen en Drs. Franka van Reekum*	Cloud nine
11.15-12.35	**Parallelsessie IX: Liver- pancreas** *Voorzitter: dr. Caroline den Hoed en dr. Dorottya de Vries*	Club nine
11.15-12.35	**Extra sessie: Screening en implementatie landelijk richtlijn TBI in transplantatie** *Voorzitter: dr Marish Oerlemans*	PIT
12.35-13.30	Lunch	Park 6

Donderdag 7 maart | middag	Programmaonderdeel	Locatie TivoliVredenburg
13.30-14.50	**Parallelsessie X: Infection and immunosuppression** *Voorzitter: dr. Lianne Messchendorp en dr. Bart Luijk*	Hertz
13.30-14.50	**Parallelsessie XI: Young professionals** *Voorzitter: Maarten Tol*	Cloud nine
13.30-14.50	**Parallelsessie XII: mini orals** *Voorzitter: dr. Maarten Christiaans en dr. Neelke van der Weerd*	Club nine
14.50-15.20	Koffiepauze	Park 6
15.20-15.25	**Plenaire sessie IV** **Thema: Innovatie – toekomst perspectieven** *Voorzitter: dr. Arjan van Zuilen en dr. Arnold van der Meer (bestuurslid NTV)* Opening en introductie sprekers	Hertz
15.25-15.45	EVLP park and preserve *dr. Niels van der Kaaij, cardiothoracaal chirurg, UMCU*	
15.45-16.05	Past, present en future of Car- T cellen *prof. dr. Jürgen Kuball, hematoloog UMCU*	Hertz
16.05-16.25	How to replace failing organs? Regenerative medicine as building blocks for the future *prof. dr. Joost Sluijter, medisch bioloog, hoofd van experimentele cardiologie in samenwerking Regenerative Medicine Center Utrecht*	Hertz
16.25-16.45	Afronding en sluiting *dr. Niels van der Kaaij, cardiothoracaal chirurg, UMCU*	Hertz
16.45	Einde congres	

Uitgebreid inhoudelijk programma woensdag 6 maart 2024

Plenaire sessie I - De toekomst van de transplantatie zorg, op weg naar Goud!

Locatie: **Hertz**

Voorzitters: *Drs. Femke Molenaar, internist-nefroloog, voorzitter organisatiecomité UMCU*
Dr. Niels van der Kaaij, cardiothoracaal chirurg, voorzitter NTV, UMC Utrecht

De voertaal van deze sessie is Nederlands.

10.00 Opening congres door voorzitter LOC en introductie van het programma

10.10 Toekomst van de (transplantatie)zorg
Michel van Schaik, directeur Gezondheidszorg, Rabobank

10.35 AI en digital health: het ziekenhuis van de toekomst
Dr. Teus Kappen, anesthesioloog UMC Utrecht

11.00 Gouden prestaties
Peter van Maurik, Stichting Sport en Transplantatie

Postersessie I

Locatie: **K.F. Hein Foyer | naast Park 6**

Moderator: *Dr. Bart-Jeroen Petri, Vaat- en transplantatie chirurg, UMC Utrecht*

11.35 Evaluating the necessity of repeating duplex ultrasound in kidney transplantation candidates: a predictive model for risk factors associated with progression of the aorto-iliac vasculature status.
L. Tofik[1], E.S. van Hattum[2], F.M. Molenaar[3], R.J. Toorop[2], A.D. van Zuilen[3], B.J. Petri[2], [1]Dept. of Nephrology and Hypertension, Dept. of Nephrology and Hypertension, University Medical Center Utrecht, Nederland. [2]Dept. of Vascular Surgery, Dept. of Vascular Surgery, University Medical Center Utrecht, Nederland. [3]Nefrologie, UMC Utrecht, Nederland.

11.40 Decoding ureteral obstructions post-kidney transplantation: risk factor analysis
S. Truijen[1], M.T.W.T. Lock[2], A.D. van Zuilen[3], R.J. Toorop[4], E.S. van Hattum[4], B.J. Petri[4], L.M.O. de Kort[2], [1]Geneeskunde, Universiteit Utrecht, [2]Urologie, UMC Utrecht, [3]Nefrologie, UMC Utrecht, [4]Dept. of Vascular Surgery, Dept. of Vascular Surgery, University Medical Center Utrecht, Nederland.

11.45 Preoperative dietary intake of sulphoraphane induces no clinically significant effect in living donor kidney transplantation
C.A.J. Oudmaijer[1], R.W.F. de Bruin[1], T. Terkivatan[1], J.N.M. IJzermans[1], L.S.S. Ooms[2], J.W. Selten[1], E. van Straalen[1], G.A. Ambagtsheer[3], [1]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, [2]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, [3]Surgery Dept., Erasmus MC, Rotterdam, Nederland.

11.50 Improving data quality and quantity of the Dutch living kidney donor registry.
M. van Londen[1], L.B. Hilbrands[2], S.A. Nurmohamed[3], M.H.L. Christiaans[4], A.D. van Zuilen[5], V.A.L. Huurman[6], A.C. Hemke[7], C. Konijn[8], J.S.F. Sanders[1], J.I. Roodnat[9], S.P. Berger[10], M.L. Kho[11], [1]Nefrologie, UMC Groningen, [2]Nefrologie, Radboudumc, Nijmegen, [3]Nefrologie, Amsterdam Universitair Medisch Centrum, Amsterdam, [4]Nefrologie, Maastricht UMC+, [5]Nefrologie, UMC Utrecht, [6]Chirurgie, Leids Universitair Medisch Centrum, Leiden, [7]Beleid, Nederlandse Transplantatie Stichting, Leiden, [8]Informatiemanagement, Nederlandse Transplantatie Stichting, Leiden, [9]Nefrologie, Erasmus MC, Rotterdam, [10]Interne geneeskunde, Nefrologie, UMC Groningen, [11]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, Nederland.

11.55 Dynamic changes in serum calcification propensity (t50) after kidney transplantation
D. Kremer[1], C.A. te Velde-Keyzer[1], T.J. Knobbe[2], S.J.L. Bakker[3], A. Pasch[4], G.J. Navis[1], J.L. Hillebrands[5], M.H. de Borst[6], I.N.V. TransplantLines Investigators[7], [1]Interne Geneeskunde, Nefrologie, UMC Groningen, [2]Interne geneeskunde, Nefrologie, UMC Groningen, [3]Interne Geneeskunde, UMC Groningen, Nederland, [4]-, Calciscon AG, Biel, Zwitserland, [5]Pathologie, UMC Groningen, [6]Interne geneeskunde, UMC Groningen, [7]Transplantatiecentrum, UMC Groningen, Nederland.

Postersessie II

Locatie: **K.F. Hein Foyer | naast Park 6**

Moderator: *Dr. Manon van der Meer, cardioloog, UMC Utrecht*

11.30 A carbon-13-labeled pyruvate test as real-time metabolic assessment of ex-situ perfused donor hearts
S.J.J. Langmuur[1], E.H. Küçükerbil[2], J.H. Amesz[1], O.C. Manintveld[3], J. de Jonge[4], Y.J.H.J. Taverne[1], [1]Cardiothoracale Chirurgie, Erasmus MC, Rotterdam, [2]Heelkunde, [3]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam, [4]Surgery, Erasmus MC, Rotterdam, Nederland.

11.35 Preoperative amiodarone use does not affect pacemaker implantation after heart transplantation
A.E. Vels[1], L.C. Kieviet[2], M.K. Szymanski[2], M.G. van der Meer[2], N.P. van der Kaaij[3], L.W. van Laake[4], A.E. Tuinenburg[2], K.A. Jacob[1], E.E. van Aarnhem[1], M.I. Oerlemans[2], [1]Cardiothoracic surgery, UMC Utrecht, [2]Cardiology, UMC Utrecht, [3]Cardiothoracale chirurgie, UMC Utrecht, [4]Cardiologie, UMC Utrecht, Nederland.

11.40 Elevated plasma immunoglobulin levels prior to heart transplantation are associated with poor post-transplantation survival
P. van den Hoogen[2], S.C.A. de Jager[1], M.M.H. Huibers[3], F.W. den Dolder[4], R. de Weger[5], E. Sierra de Koning[5], M.I. Oerlemans[6], N. de Jonge[6], L.W. van Laake[7], P.A. Doevendans[8], J.P.G. Sluijter[1], A. Vink[5], [1]Experimental Cardiology, UMC Utrecht, [2]Experimental Cardiologie, UMC Utrecht, [3]Dept. of Genetics, UMC Utrecht, [4]Dept. of Pathology, [5]Dept. of Pathology, UMC Utrecht, [6]Cardiology, UMC Utrecht, [7]Cardiologie, UMC Utrecht, [8]Cardiology, Central Military Hospital, Utrecht, Nederland.

11.45 Quantitative and functional differences in SARS-CoV-2 specific mucosal and serum antibody responses following mRNA-1273 vaccination in healthy controls and kidney transplant recipients

V.J.C.H. Koomen[1], J. Fröberg[2], C. Gaast-deJongh[2], A.L. Messchendorp[3], F.J. Bemelman[4], C.C.B. Baan[5], D. van Baarle[6], J.S.F. Sanders[7], R.G. van der Molen[2], L.B. Hilbrands[8], D.D. Diavatopoulos[2], [1]Nierziekten, Radboudumc, Nijmegen, [2]Laboratorium Medische Immunologie, Radboudumc, Nijmegen,[3]Nefrologie, UMCG, Groningen, [4]Nefrologie, Amsterdam UMC, Amsterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, [6]Medische microbiologie, UMCG, Groningen, [7]Nefrologie, UMC Groningen, [8]Nefrologie, Radboud Universitair Medisch Centrum, Nijmegen, Nederland.

Postersessie III

Locatie: K.F. Hein Foyer | naast Park 6

Moderator: *Drs. Victor Boom, nefroloog, UMC Utrecht*

11.30 Interpretable prediction of kidney allograft rejection using machine learning: a comparison between linear and non-linear models

A.A.S. Assis de Souza[1], A.P.S. Stubbs[2], D.A. Hesselink[3], C.C.B. Baan[1], K. Boer[4], [1]Internal Medicine, Erasmus Medical Center, Rotterdam, [2]Pathology and Clinical Bioinformatics, Erasmus Medical Center, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Internal Medicine, Transplant Institute, Erasmus MC, Rotterdam, Nederland.

11.35 Prolonged waiting time for immunized patients mainly due to blood group and non-transplantable status: a retrospective analysis to create a prediction model

T. Tramper[1], D.L. Roelen[2], M.G.H. Betjes[3], D.A.J. van den Broek[4], G.W. Haasnoot[5], D. van der Helm[4], J.A. Kal-van Gestel[6], M.E.J. Reinders[7], J. van de Wetering[7], A.P.J. de Vries[8], A.E. de Weerd[6], [1]Nefrologie en niertransplantatie, Erasmus MC, Rotterdam, [2]Immunologie, Leids Universitair Medisch Centrum, Leiden, [3]Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, [4]Nierziekten, Leiden University Medical Centre, Leiden, [5]HLA diagnostics laboratory, Leids Universitair Medisch Centrum, Leiden, [6]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Nierziekten, Leids Universitair Medisch Centrum, Leiden, Nederland.

11.40 Cost-effectiveness of Maribavir for post-transplant refractory cytomegalovirus infection: A dutch perspective

M. van Wijk[2], T.A. van Heerde[1], P. Plasman[2], S. van Rijn[3], [1]Medical Affairs, Takeda Nederland, Hoofddorp, [2]Dept. of Real-World Evidence, HEOR, Market Access & Pricing, IQVIA Nederland, Amsterdam, [3]Patient Value & Access, Takeda Nederland, Hoofddorp, Nederland.

11.45 High density lipoprotein particles in stable outpatient kidney transplant recipients

J. Jonker[1], D. Kremer[2], E.J. Gore[3], H.G.M. Niesters[3], C. van Leer-Buter[3], P. Bourgeois[4], M.A. Connelly[5], S.P. Berger[6], J.S.F. Sanders[7], S.J.L. Bakker[8], [1]Nefrologie, UMCG, Groningen, [2]Interne Geneeskunde, Nefrologie, UMC Groningen, [3]Medische microbiologie, UMCG, Groningen, Nederland, [4]Molecular Virology, BioMérieux, Verniolle, Frankrijk, [5]Diagnostics Research & Development, Labcorp, Morrisville, Verenigde Staten,

[6]Interne geneeskunde, Nefrologie, UMC Groningen, [7]Nefrologie, UMC Groningen, [8]Interne Geneeskunde, UMC Groningen, Nederland.

11.50 A simple scoring system during normothermic machine perfusion may salvage kidneys initially declined for transplantation
Y.F. Fang[1], G.A. Ambagtsheer[1], R.C. Minnee[2], R.W.F. de Bruin[3], [1]Surgery Dept., Erasmus MC, Rotterdam, [2]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, [3]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Plenaire sessie II: Prijsuitreiking

Locatie: Hertz

Voorzitter: *Dr. Niels van der Kaaij, cardiothoracaal chirurg, voorzitter NTV, UMC Utrecht*

13.00 Pitches Chiesi prijs 2024 – Beste Idee in Transplantatie

Uitreiking Astellas Transplantatie Researchprijs 2024

Voordracht winnaars Astellas prijs 2023:
'Chimeric HLA Antibody Receptor (CHAR) T cell engineering – a new approach to target HLA sensitization'
Ilse Gille en Sebastiaan Heidt, LUMC

Parallelsessie I: Transplantation outcome

Locatie: Hertz

Voorzitter: *Dr. Marije Baas en Dr. Raechel Toorop*

13.50 Heart donation and transplantation of circulatory death donors: the dutch experience
N.P. van der Kaaij[1], O.C. Manintveld[2], Y.J.H.J. Taverne[3], A.E.T. Snijders[1], K. Damman[4], L.W. van Laake[5], M.E. Erasmus[6], [1]Cardiothoracale chirurgie, UMC Utrecht, [2]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam, [3]Cardiothoracale Chirurgie, Erasmus MC, Rotterdam, [4]Cardiologie/Transplantatie instituut, UMC Groningen, [5]Cardiologie, UMC Utrecht, [6]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen, Nederland.

14.00 Ten years of quality monitoring of abdominal organ procurement in the Netherlands and its impact on transplant outcome
K.A. Chotkan[1,2], I.P.J. Alwayn[3], A.C. Hemke[4], A. Baranski[1], W.N. Nijboer[3], J. Deggens[4], R.A. Pol[5], A.E. Braat[1], [1]Heelkunde, Leids Universitair Medisch Centrum, Leiden, [2]Heelkunde, Nederlandse Transplantatie Stichting, Leiden, [3]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, [4]Beleid, Nederlandse Transplantatie Stichting, Leiden, [5]Chirurgie, UMC Groningen, Nederland.

Woensdag 6 maart 2024

14.10 Optimizing organ donation procedures in the Netherlands: A comprehensive analysis of time shifts and slot utilization post-implementation of the three independent procurement teams

J. Niesing[1], I.J.C. Dielwart[2], H.C.R. Verberght[3,4], A.C. Hemke[5], S.W.M. Olde Damink[3], M.C.G. van de Poll[6], J. de Jonge[7], R.A. Pol[8], [1]Surgery, University Medical Center Groningen, [2]Interne geneeskunde | chirurgie, UMC Groningen, [3]Surgery, Maastricht University Medical Center, Maastricht, [4]Surgery, NUTRIM, School for Nutrition and Translational Research in Metabolism, Maastricht, [5]Beleid, Nederlandse Transplantatie Stichting, Leiden, [6]Intensive Care, Maastricht University Medical Center, Maastricht, [7]Surgery, Erasmus MC, Rotterdam, [8]Chirurgie, UMC Groningen, Nederland.

14.20 Association between timing of graft procurement with graft discard rates and post-transplant outcomes

M.J. Sonneveld[1], W.G. Polak[2], A.J.T. Jens[3], C. den Hoed [4], S. Darwish Murad[4], A.J. van der Meer[4], [1]MDL, Erasmus MC, Rotterdam, [2]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, [3]Eurotransplant, Eurotranplant, Leiden, [4]MDL, Erasmus MC Transplant Institute, Rotterdam, Nederland.

14.30 Analysis of reported donors that not resulted in transplantation: the hidden prize of an increase in absolute numbers of organ transplantations

K.A. Chotkan[1,2], M.A. Kuiper[3], J. Deggens[4], I.P.J. Alwayn[5], A.E. Braat[1], N.J. Jansen[4], [1]Heelkunde, Leids Universitair Medisch Centrum, Leiden, [2]Heelkunde, Nederlandse Transplantatie Stichting, Leiden, [3]Intensive Care, Medisch Centrum Leeuwarden, Leeuwarden, [4]Beleid, Nederlandse Transplantatie Stichting, Leiden, [5]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, Nederland.

14.40 Excellent outcome of kidney grafts donated after euthanasia compared to standard donation after circulatory death kidneys

J.S. Slagter[1], R.C. Minnee[1], J.A.M. Hagenaars[2], H.J.A.N. Kimenai[1], M.E.J. Reinders[3], J. van de Wetering[3], R.J. Porte[4], [1]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, [2]Organ Donation and Transplant Coordination, Erasmus MC Transplant Institute, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland.

14.50 Comparable outcomes for old, older and very old deceased donors in old kidney transplant recipients

S.E. de Boer[1], E. Tegzess[1], C. Moers[2], S.P. Berger[3], J.S.F. Sanders[4], [1]Dept. of Internal Medicine, Division of Nephrology, UMCG, Groningen, [2]Dept. of Surgery, UMCG, Groningen, [3]Interne geneeskunde, Nefrologie, UMC Groningen, [4]Nefrologie, UMC Groningen, Nederland.

15.00 Anonimiteit tussen ontvanger en donor: Juridisch kader en praktische handvaten om anonimiteit te bewaken

L. Raat[1], E. van Dieten[2], J.N. Nathan[3], [1]Juridische Zaken, Nederlandse Transplantatie Stichting, Leiden, [2]Donorvoorlichting, Communicatie en Onderwijs (DCO), Nederlandse Transplantatie Stichting, Leiden, [3]Raad van Bestuur, Nederlandse Transplantatie Stichting, Leiden, Nederland.

Voertaal: Nederlands

Woensdag 6 maart 2024

Parallelsessie II: LWTZ

Locatie: **Cloud nine**

Voorzitters: *Monique Mullens en Marion Wessels*

13.50 Beweegprogramma NTX
Jolien Netjes, fysiotherapeut, UMC Utrecht

14.08 Designing a theory-driven prehabilitation program for kidney transplant candidates: insights from the PreCareTx-study
C. Annema[1], A.J. Haanstra[2], Y. van der Veen[3], H. Maring[4], E.E. Quint[5], S.P. Berger[6], A.V. Ranchor[7], E.J. Finnema[2], [1]Gezondheidswetenschappen, sectie Verplegingswetenschap, UMC Groningen, Nederland, [2]Division of Nursing Science, Dept. of Health Sciences, [3]Dietetiek, UMC Groningen, [4]Revalidatie, UMC Groningen, [5]Chirurgie, UMC Groningen, [6]Interne geneeskunde, Nefrologie, UMC Groningen, [7]Gezondheidswetenschappen, sectie Gezondheidspsychologie, UMC Groningen, Nederland.

14.18 Protocollair bekommeren
I.A. Faber[1], E. Verweij[2], R.A.M. Zekhuis[1], A.D. van Zuilen[2], [1]UMCU afd. Nefrologie, [2]Nefrologie, UMC Utrecht, Nederland.

14.28 Verpleegkundige ondersteuning na niertransplantatie d.m.v. Leefstijlproject en Menukaart 'Kies voor beter'
A.H.M. Kooistra[1], E. Verweij[1], M.J.C. Wessels-Bakker[2], I.A. Faber[3], J.A. Netjes[4], F.M. Molenaar[1], F. Hartgens[5], A.D. van Zuilen[1], [1]Nefrologie, UMC Utrecht, [2]Divisie DIGD, afdeling Nefrologie HPno. F03.221, Universitair Medisch Centrum Utrecht, [3]UMCU afd. Nefrologie, [4]Revalidatie, Fysiotherapiewetenschap en Sport, UMC Utrecht, [5]Division Brain, Dept. of Rehabilitation, Physiotherapy Science and Sports, UMC Utrecht, Nederland.

14.38 Uitdagingen binnen de diëtetiek zorg na transplantatie
Nicole Broekman, diëtiste, UMC Utrecht

14.56 Blaaskatheter verwijderen na niertransplantatie: hoe sneller hoe beter?
Anika Boersma, transplantatieverpleegkundige, UMC Utrecht

15.01 Beeldmateriaal bij thema voorlichting aan longtransplantatie patiënten?
Esther Zijderveld, verpleegkundige, UMC Utrecht

15.05 Mogelijkheid tot stellen van vragen

Parallelsessie III: Basic immunology

Locatie: **Club Nine**

Voorzitter: *Dr. Eric Spierings en Dr. Karin Boer*

13.50 Noninvasive monitoring of organ transplant rejection by immuno-PET imaging

R. J. F. Maas[1,2,3], J. Munitz[1,2], W. Wang[1,2], A. Ranzenigo[1,2], M. Umali[1,2], W. Tielemans[1,2], S. A. Nauta[1,2], J. Morla-Folch[1,2], T. Post[4], V. Peric[1,2], Z. A. Fayad[1,2], H. L. Ploegh[5], M. Rashidian[6,7], A. S. Farid[6,7], M. M. T. van Leent[1,2,8], W. J. M. Mulder[1,2,3,9], A. J. P. Teunissen[1,2,8,10]. [1]BioMedical Engineering and Imaging Institute, Icahn School of Medicine at Mount Sinai, New York, New York, USA. [2]Department of Diagnostic, Molecular, and Interventional Radiology, Icahn School of Medicine at Mount Sinai, New York, New York, USA. [3]Department of Internal Medicine and Radboud Institute for Molecular Life Sciences, Radboud University Medical Center, Nijmegen, the Netherlands. [4]Department of Nephrology and Radboud Institute for Molecular Life Sciences, Radboud University Medical Center, Nijmegen, The Netherlands. [5]Program in Cellular and Molecular Medicine, Boston Children's Hospital, Harvard Medical School, Boston, Massachusetts, USA. [6]Department of Cancer Immunology and Virology, Dana-Farber Cancer Institute, Boston, Massachusetts, USA. [7]Department of Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA. [8]Cardiovascular Research Institute, Icahn School of Medicine at Mount Sinai, New York, New York, USA. [9]Department of Chemical Biology, Eindhoven University of Technology, Eindhoven, the Netherlands. [10]Icahn Genomics Institute, Icahn School of Medicine at Mount Sinai, New York, New York, USA.

14.00 Non-HLA antigen-reactive CD4+ T cells against PECR and AT1R provide a novel and potential important pathway for induction of fibrosis in transplanted kidneys

N.H.R. Litjens, F. Prevoo, M. Klepper, M.G.H. Betjes, Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, The Netherlands.

14.10 Episomal DNA vector-induced EPO-overexpressing kidney organoids exhibit physiological effects after implantation

Z. Du[1], A. Bas-Cristóbal[1,2], M. Urban[3], A. Hartley[4], D. Ratsma[5], M. Koedam[6], T.P.P. van den Bosch[7], M.C. Clahsen-van Groningen[7], J. Gribnau[8], J. Mulder[9], M.E.J. Reinders[10], C.C.B. Baan[11], B. van der Eerden[6], R. Harbottle[3], M.J. Hoogduijn[12], [1]Erasmus MC Transplant Institute, Dept. of Internal Medicine, Erasmus University Medical Center, Rotterdam, [2]Erasmus MC Transplant Institute, Dept. of Internal Medicine, Sophia Children's Hospital, Erasmus University Medical Center, Rotterdam, Nederland, [3]DNA Vectors Lab, German Cancer Research Center (DKFZ), Heidelberg, [4]DNA Vectors Lab, German Cancer Research Center (DKFZ), Heidelberg, German Cancer Research Center (DKFZ), Heidelberg, Duitsland, [5]Laboratory for Calcium and Bone Metabolism, Dept. of Internal Medicine, Erasmus University Medical Center, Rotterdam, [6]Laboratory for Calcium and Bone Metabolism, Erasmus University Medical Center, Rotterdam, [7]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, [8]Dept. of Developmental Biology and iPS Core Facility, Erasmus University Medical Center, Rotterdam, [9]Dept. of Pediatrics, Sophia Children's Hospital, Erasmus University Medical Center, Rotterdam, [10]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [11]Internal Medicine, Erasmus Medical Center, Rotterdam, [12]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, Nederland.

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14.20 Subsets phenotyping and regulatory checkpoints analysis on circulating B cells in kidney transplant recipients

D.H.A. Altulea[1], T. Bijma[2], J.C. van den Born[3], P.H. Heeringa[4], L.C. Reteig[5], R.G.M. Lammerts[6], S.P. Berger[7], J.S.F. Sanders[8], [1]Division of Nephrology, Dept. of Internal Medicine, University Medical Center Groningen, [2]Dept. of Pathology and Medical Biology, University Medical Center Groningen, University Medical Center Groningen, [3]Nierziekten, University Medical Centre Groningen, [4]Dept. of Pathology and Medical Biology, University of Groningen, University, University Medical Center Groningen, [5]Center of Translational Immunology, University Medical Center Utrecht, [63] Transplantation Immunology, Dept. of Laboratory Medicine, University Medical Center Groningen, [7]Interne geneeskunde, Nefrologie, UMC Groningen, [8]Nefrologie, UMC Groningen, Nederland.

14.30 Peptide sharing between CMV and mismatched HLA enhances T-cell-mediated rejection after kidney transplantation

E.T.M. Peereboom[1], J. Jairam[1], F.M. Verduyn Lunel[2], A.D. van Zuilen[3], E. Spierings[4], [1]Center for Translational Immunology, UMC Utrecht, [2]Medische Microbiologie, UMC Utrecht, [3]Nefrologie, UMC Utrecht, [4]Center for Translational Immunology, University Medical Center Utrecht, Nederland.

14.40 Site-directed mutagenesis of HLA-DQ molecules reveals the amino acids crucial for human monoclonal HLA-specific antibody binding

C.S.M. Kramer[1], U. Singh[2], S. Bezstarosti[1], N. Petrosyan[2], F. Quiroz[2], E.K.W. Hui[2], D. Suh[2], F.H.J. Claas[1], D. Lowe[2], T. Meng[2], S. Heidt[3], [1]Immunology, Leiden University Medical Center, Leiden, Nederland, [2]Research & Development, Transplant Diagnostics, Thermo Fisher Scientific, West Hills, Verenigde Staten, [3]Immunologie, LUMC, Leiden, Nederland.

14.50 Targeting bcl6-mediated responses to inhibit allogeneic t follicular helper cell functions

R. Kraaijeveld[1], L. Steines[2], M. Dieterich[3], D.A. Hesselink[4], C.C.B. Baan[5], [1]Internal medicine - Division of Nephrology and Transplantation, Erasmus MC transplant institute, University Medical Center Rotterdam, Rotterdam, Nederland, [2]Dept. of Nephrology, University Hospital Regensburg, Regensburg, Bavaria, Duitsland, [3]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, Nederland.

Parallelsessie IV: Machine perfusion

Locatie: **Hertz**

Voorzitters: *Prof. dr. Henri Leuvenink en drs. Sue Braithwaite*

15.40 Cellular responses of donor kidneys during normothermic machine perfusion can predict suboptimal post-transplant outcomes
H. Tejeda Mora[1], S. Li[1], D.M. Hullegie-Peelen[2], D. Schumacher[3 / 4], A. Babler[3 / 4], F. Schreibing[3 / 4], T.M. Anslinger[3 / 4], M.E.J. Reinders[5], R. Kramann[1 / 6 / 7], R.C. Minnee[8], M.J. Hoogduijn[2], [1]Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [2]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, Nederland, [3]Division of Nephrology and Clinical Immunology, RWTH Aachen University, Medical Faculty, Aachen, [4]Division of Nephrology and Clinical Immunology, Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, Aachen, Duitsland, [5]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, Nederland, [6]Internal Medicine, RWTH Aachen University, Medical Faculty, Aachen, [7]Internal Medicine, Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, Aachen, Duitsland, [8]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, Nederland.

15.50 Normothermic machine perfusion and ischemic injury alter the metabolomic signature of porcine kidneys
B. Ogurlu[1], L.A. van Furth[1], T.L. Hamelink[2], V.A. Lantinga[3], Y. Zhou[1], H. Leuvenink[4], M. Pietzner[5], A.K. Keller[6], C. Moers[7], [1]Chirurgie, UMC Groningen, [2]Chirurgie - Orgaandonatie en Transplantatie, UMC Groningen, [3]Chirurgie, University Medical Center Groningen, [4]Chirurgie, UMC Groningen, Nederland, [5]Computational Medicine, Berlin Institute of Health at Charité – Universitätsmedizin Berlin, Berlin, Duitsland, [6]Urology, Aarhus University Hospital, Aarhus, Denemarken, [7]Dept. of Surgery, UMCG, Groningen, Nederland.

16.00 Magnetic resonance imaging assessment of porcine and discarded human kidneys during ex vivo normothermic machine perfusion: PREPAIR-1 & PREPAIR-2 study
T.L. Hamelink[1], V.A. Lantinga[2], J. Castelein[3], B. Ogurlu[4], H. Leuvenink[5], R.J.H. Borra[3], C.L. Jaynes[1], A.K. Keller[6], C. Moers[7], [1]Chirurgie - Orgaandonatie en Transplantatie, UMC Groningen, [2]Chirurgie, UMC Groningen, [3]Radiologie, UMC Groningen, [4]Chirurgie, UMC Groningen, [5]Chirurgie, UMC Groningen, Nederland, [6]Urology, Aarhus University Hospital, Aarhus, Denemarken, [7]Dept. of Surgery, UMCG, Groningen, Nederland.

16.10 Normothermic machine perfusion of discarded human donor kidneys: the first observations of the PREPAIR-2 study
V.A. Lantinga[1], T.L. Hamelink[2], B. Ogurlu[3], C.L. Jaynes[2], H. Leuvenink[4], C. Moers[5], [1]Chirurgie, University Medical Center Groningen, [2]Chirurgie - Orgaandonatie en Transplantatie, UMC Groningen, [3]Chirurgie, UMC Groningen, [4]Chirurgie, UMC Groningen, [5]Dept. of Surgery, UMC Groningen, Nederland.

16.20 Preserving mitochondrial function with sodium thiosulfate in donor heart preservation: a pre-clinical ovine model
I.A. Ertugrul[1], R. Puspitarani[2], V. van Suylen[1], M.A. Hu[3], B.D. Westenbrink[2], H. van Goor[4], M.E. Erasmus[5], [1]Cardiothoracale Chirurgie, UMC Groningen, [2]Cardiologie, UMC Groningen, [3]Afd. Cardiothoracale Chirurgie, UMC Groningen, [4]Medische microbiologie en Patholgie, UMC Groningen, [5]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen, Nederland.

16.30 Long-term ex situ normothermic machine perfusion of human donor livers results in perfusion fluid containing physiological levels of active hemostatic proteins
B. Lascaris[1], S.B. Bodewes[2], J. Adelmeijer[3], M.W.N. Nijsten[4], R.J. Porte[5], V.E. de Meijer[2], J.A. Lisman[3], [1]Surgery, Section of Hepatobiliary Surgery and Liver Transplantation, UMC Groningen, [2]Dept. of Surgery, University Medical Center Groningen, [3]Surgical Research Laboratory, UMC Groningen, [4]Critical Care, UMC Groningen, [5]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland.

16.40 The effect of donor and donation parameters and viability assessment criteria during normothermic machine perfusion of the liver on the decision to transplant: a meta-analysis
A.M.P. den Dekker[1], A. Franssen[1], J.B. Doppenberg[1], I.P.J. Alwayn[2], [1]LUMC transplant center, Leiden University Medical center, Leiden, [2]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, Nederland.

16.50 Activated donor-derived platelets are released from human donor livers during normothermic machine perfusion
S.B. Bodewes[1], B. Lascaris[2], B.P. van den Boom[3], R.J. Porte[4], V.E. de Meijer[1], J.A. Lisman[5], [1]Dept. of Surgery, University Medical Center Groningen, [2]Surgery, Section of Hepatobiliary Surgery and Liver Transplantation, University Medical Center Groningen, [3]Surgery, University Medical Center Groningen, [4]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, [5]Surgical Research Laboratory, University Medical Center Groningen, Nederland.

Parallelsessie V: ODC De marginale organen: kansen en toekomst?

Locatie: Cloud Nine

Voorzitters: Hanne Verberght, Astrid Snijders

15.40 Opening sessie met interactieve casus – ODC uit werkgroep
Hanne Verberght

15.50 De ‘marginale’ donor op de IC, overwegingen en ethische aspecten
Laura ten Haaften, internist/intensivist, Meander MC, Amersfoort

16.10 De optimalisatie van thorax organen ‘current practice en future goals’
Sanne Langmuur, PhD student & OPTC, Erasmus MC Rotterdam

16.30 Uitkomsten transplantatie met EVLP en effect op de wachtlijst
Dr. Tji Gan, longarts, UMC Groningen

16.50 Afsluiting met interactieve vragen

Parallelsessie VI: Heart-Lung transplantation

Locatie: **Club Nine**

Voorzitter: *Dr. Marish Oerlemans en dr. Michiel Erasmus*

15.40 The ability of an electronic nose to distinguish between infections in lung transplant recipients

N. Wijbenga[1/2], C.E. Luijendijk[1/2], R. van Pel[1/2], B.J. Mathot[1/2], L. Seghers[1/2], D. Bos[3], O.C. Manintveld[4], M.E. Hellemons[1/2], [1]Dept. of Respiratory Medicine, Erasmus University Medical Center, Rotterdam, [2]Dept. of Respiratory Medicine, Erasmus MC Transplant Institute, Rotterdam, [3]Radiology & Nuclear Medicine / Epidemiology, Erasmus MC, University Medical Center, Rotterdam, [4]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam

15.49 Evaluation of long-lasting lung inflammation in circulatory death rat donors using tissue culture and normothermic regional perfusion

M.M.A.R. Munhoz Assis Ramos[1/2], L.F.A. Ferreira Anunciação[1], F.Y.R.S. Yamamoto Ricardo da Silva[1], C.J.C. De Jesus Correia[1], F.L.P.M. Pinho Moreira[1], A.C.B.F. Breithaupt-Faloppa[1], [1]Cardiopneumologia, Universidade de São Paulo, São Paulo, Brazilië, [2]Cardiopneumologia, UMC Groningen, Nederland.

15.58 Optimising leukocyte filtration during clinical ex vivo lung perfusion: A novel approach

M.A. Hu[1], Z.L. Zhang[2], R.F.H. Roland[3], C. van de Wauwer[4], E.A.M. Verschuuren[5], H. Leuvenink[6], M.E. Erasmus[7], [1]Afd. Cardiothoracale Chirurgie, UMC Groningen, [2]Cardiothoracale Chirurgie, [3]Thorax, UMC Groningen, [4]Cardiothoracale Chirurgie, [5]Longziekten, UMCG, Groningen, [6]Chirurgie, UMC Groningen, [7]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen

16.07 Vascular complications in lung transplantation with and without use of extra corporeal membrane oxygenation

L.E. Boersma[1], D. Ruigrok[2], N.P. van der Kaaij[3], J.A.J.M. Hermens[4], N. Kusadasi[4], E.E.C. de Waal[1], [1]Dept. of Anaesthesiology, UMC Utrecht, [2]Longziekten, UMC Utrecht, [3]Cardiothoracale chirurgie, UMC Utrecht, [4]Dept. of Intensive Care Medicine, UMC Utrecht

16.16 High incidence of in-hospital venous thromboembolism after lung transplantation

J. Admiraal[1], L.E. Boersma[2], R. Schonwetter[3], N.P. van der Kaaij[4], N. Kusadasi[5], M.C. Post[6/7], H.D. Luijk[1], D. Ruigrok[1], [1]Longziekten, UMC Utrecht, [2]Dept. of Anaesthesiology, University Medical Center, Utrecht, [3]Longziekten, St. Antonius Ziekenhuis, Nieuwegein, [4]Cardiothoracale chirurgie, UMC Utrecht, [5]Dept. of Intensive Care Medicine, University Medical Center, Utrecht, [6]Cardiologie, St. Antonius Ziekenhuis, Nieuwegein, [7]Cardiologie, UMC Utrecht.

16.25 De prevalentie van non-responders na hepatitis B vaccinatie onder patiënten die op de wachtlijst staan voor longtransplantatie

I. van Ewijk-Hagenaar[1], L. de Boer[1], H.D. Luijk[2], E.M. Berg[1], A.H.W. Bruns [3], D. Ruigrok[2], [1]Longtransplantatie, UMC Utrecht, [2]Longziekten, UMC Utrecht, [3]Infectieziekten, UMC Utrecht

16.34 Sars-COV-2 in a cohort of lung transplant recipients: changes in mental health problems, medication adherence and lifestyle behaviour

M.J.C. Wessels-Bakker[1], A.D. van Zuilen[2], H.D. Luijk[3], C. Annema[4], W. Cahn[5], R. Schappin[6], [1]Divisie DIGD, afdeling Nefrologie HPno. F03.221, Universitair Medisch Centrum Utrecht, [2]Nefrologie, UMC Utrecht, [3]Longziekten, UMC Utrecht, [4]Gezondheidswetenschappen, sectie Verplegingswetenschap, UMC Groningen, [5]Psychiatrie, Universitair Medisch Centrum Utrecht, [6]Afdeling Dermatologie, Erasmus MC, Rotterdam, Nederland.

16.43 Lung injury evaluation after circulatory death followed by ventilation during warm ischemia and ex-vivo perfusion

M.M.A.R. Munhoz Assis Ramos[1 / 2], M.V.S. Marina[3], S.Y. Shuqi[3], M.A. Hu[4], R.F.H. Roland[5], M.E. Erasmus[6], A.C.B.F. Breithaupt-Faloppa[1], H. Leuvenink[7], [1]Cardiopneumologia, Universidade de São Paulo, São Paulo, Brazilië, [2]Cardiopneumologia, UMC Groningen, [3]Chirurgie, UMC Groningen, [4]Afd. Cardiothoracale Chirurgie, UMC Groningen, [5]Thorax, UMC Groningen, [6]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen, [7]Chirurgie, UMC Groningen, Nederland.

16.50 The lung dashboard: new way of monitoring Dutch lung waiting list, transplants and outcomes

A.C. Hemke[1], B. Burg van den[2], C. Konijn[2], H.D. Luijk[3], L. Seghers[4,1,5], E.A.M. Verschuuren[6], [1]Beleid, Nederlandse Transplantatie Stichting, Leiden, [2]Informatiemanagement, Nederlandse Transplantatie Stichting, Leiden, [3]Longziekten, UMC Utrecht, [4]Dept. of Respiratory Medicine, Erasmus University Medical Center, Rotterdam, [5]Dept. of Respiratory Medicine, Erasmus MC Transplant Institute, Rotterdam, [6]Longziekten, UMCG, Groningen, Nederland.

Uitgebreid inhoudelijk programma donderdag 7 maart 2024

Plenaire sessie III

Locatie: **Hertz**

Voorzitter: *Drs. Elize Berg, transplantatie longarts UMC Utrecht en Dr. Sebastiaan Heidt, NTV-bestuurslid*

09.05 Afstoting anders belicht: Een hoofdrol voor T-cel epitopen
Eric Spierings, medisch immunoloog, staflid Centraal Diagnostisch Laboratorium, UMC Utrecht

09.25 Het korte telomeersyndroom en longtransplantatie
Dr. Coline van Moorsel, Hoofd ILD research en ontwikkeling longziekten, ILD centrum St. Antonius Ziekenhuis, Nieuwegein

09.45 OPTC: kennismaking met een nieuwe functie en kansen voor de toekomst
Jitte Jennekens en Emmelien Hazekamp, Orgaanperfusionist / Transplantatie coördinator, UMC Utrecht

Uitreiking NTV prijzen

Locatie: **Hertz**

Voorzitter: *Dr. M. C. van Buren, NTV-bestuurslid*

10.05 Presentatie winnaar Innovatie in Transplantatie Onderwijs NTV 2023
project 'Patiënteneducatie – Leven na een transplantatie'.
Dr. Marleen van Buren, verpleegkundig specialist, Erasmus MC, Rotterdam

10.10 Presentatie winnaar LWTZ-NTV Innovatie- Kwaliteitsprijs 2023
Project innovatieve Medicatie training box na transplantatie (MediT-box)
Mireille Houthoff, Verpleegkundig specialist, Erasmus MC, Rotterdam
Myrthe van der Zanden, Verplegingswetenschapper, Erasmus MC, Rotterdam

10.15 Presentatie winnaar NTV Wetenschapsprijs 2023
Dr. Gonca Karahan, postdoctoral researcher, LUMC

10.30 Uitreiking Jon J. van Roodprijs 2024
Door: Dr. M. C. van Buren, NTV-bestuurslid
10.32 Presentatie winnaar Jon J. van Roodprijs 2024

10.42 Uitreiking NTV Wetenschapsprijs 2024
Door: Dr. M. C. van Buren, NTV-bestuurslid

Parallelsessie VII: Immunology clinical

Locatie: **Hertz**

Voorzitters: *Dr. Kirsten Geneugelijk en Dr. Sebastiaan Heidt*

11.15 Pretransplant donor-specific Luminex HLA antibodies in kidney transplantation: innocent or not?

A.M. Brandsma[1], C.M. Ranzijn[1], S.A. Nurmohamed[2], N.C. van der Weerd[3], K.A.M.I. van der Pant[3], N.M. Lardy[1], F.J. Bemelman[3], [1]HLA diagnostiek, Sanquin, Amsterdam, [2]Nefrologie, Amsterdam UMC, [3]Nefrologie, Amsterdam UMC.

11.25 Novel minimally invasive diagnostics using AI-assisted high-dimensional morphology analysis distinguishes kidney transplant rejection with high accuracy at the single cell level

T.P.P. van den Bosch[1], M.C. Clahsen-van Groningen[1], S. Sinnadurai[1], J. Cruz[2], K. Boer[3], Z. Lian[2], R. Carelli[2], M. Nakaki[2], V. Lu[2], D.A. Hesselink[4], C.C.B. Baan[5], K. Miller[2], H. Hilal[1], R. Kramann[6/7/8], M. Salek[2], M. Masaeli[2], P.J. van der Spek[1], [1]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, Nederland, [2]Deepcell, Deepcell Inc., Menlo Park, CA, Verenigde Staten, [3]Internal Medicine, Transplant Institute, Erasmus MC, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, [6]Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, Nederland, [7]Internal Medicine, RWTH Aachen University, Medical Faculty, Aachen, [8]Internal Medicine, Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, Aachen, Duitsland.

11.35 Repeated HLA-mismatches of either HLA class without detectable HLA-antibodies as adequately ruled out by the Luminex platform are not a risk factor for rejection or graft loss: A multicentre retrospective analysis.

D.A.J. van den Broek[1], J.C. van den Born[2], D. van der Helm[1], B.G. Hepkema[3], J.I. Rotmans[1], A.P.J. de Vries[4], D.L. Roelen[5], [1]Nierziekten, Leiden University Medical Centre, Leiden, [2]Nierziekten, University Medical Centre Groningen, [3]Transplantatie immunologie, Laboratoriumgeneeskunde, UMCG, Groningen, [4]Nierziekten, Leids Universitair Medisch Centrum, Leiden, [5]Immunologie, Leids Universitair Medisch Centrum, Leiden, Nederland.

11.45 Blood group antibody titers in long-waiting candidates for ABO-incompatible kidney exchange program transplantation: a retrospective cohort study.

M.F. Klaassen[1], M. de Klerk[1], J.A. Kal-van Gestel[1], M.L. Kho[2], J. van de Wetering[3], Z. Al Fatly[1], M.E.J. Reinders[3], J.I. Roodnat[4], A.E. de Weerd[1], [1]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [2]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Nefrologie, Erasmus MC, Rotterdam, Nederland.

11.55 Cross-over+ allocation as compared to historical kidney exchange transplantations: a Monte Carlo simulation.

M.F. Klaassen[1], J. van de Wetering[2], J.A. Kal-van Gestel[1], M. de Klerk[1], A.C. Hemke[3], C. Konijn[4], M.C. Baas[5], F.J. Bemelman[6], H. Bouwsma[7], M.H.L. Christiaans[8], M.F.C. de Jong[9], A.D. van Zuilen[10], T. Dollevoet[11], K. Glorie[12], M.L. Kho[13], J.I. Roodnat[14], M.E.J. Reinders[2], A.E. de Weerd[1], [1]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [2]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam,

[3]Beleid, Nederlandse Transplantatie Stichting, Leiden, [4]Informatiemanagement, Nederlandse Transplantatie Stichting, Leiden, [5]Dept. of Internal Medicine, Radboud University Medical Center, Nijmegen, [6]Nefrologie, Amsterdam UMC, Amsterdam, [7]Dept. of Internal Medicine, Leiden University Medical Center, Leiden, [8]Nefrologie, Maastricht UMC+, Maastricht, [9]Interne Geneeskunde, onderafdeling Nefrologie, UMC Groningen, [10]Nefrologie, UMC Utrecht, [11]Erasmus School of Economics, Erasmus University Rotterdam, Rotterdam, [12]Erasmus Q-Intelligence, Erasmus University Rotterdam [13]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam,[14]Nefrologie, Erasmus MC, Rotterdam, Nederland.

12.05 Development of a decentralized epitope matching simulation model to improve kidney transplantation outcomes

R.A. van Amerongen[1], B.M. Matern[2], M. Niemann[3], E. Spierings[4], [1]CTI, University Medical Center Utrecht, Nederland, [2]Bioinformatics, PIRCHE AG, Berlin, [3]Technology, PIRCHE AG, Berlijn, Duitsland, [4]Center for Translational Immunology, University Medical Center Utrecht, Nederland.

12.15 Experimental data on PIRCHE and T-cell reactivity: HLA-DPB1-derived peptides identified by PIRCHE-I show binding to HLA-A*02:01 in vitro and T-cell activation in vivo.

E.T.M. Peereboom[1], A.E.M. Maranus[1], L.M. Timmerman[1], K. Geneugelijk[2], E. Spierings[3], [1]Center for Translational Immunology, UMC Utrecht, [2]Central Diagnostic Laboratory, UMC Utrecht, [3]Center for Translational Immunology, UMC Utrecht, Nederland.

Parallelsessie VIII: Kidney clinical

Locatie: Cloud Nine

Voorzitter: *Dr. Martijn van den Hoogen en Drs. Franka van Reekum*

11.15 Donor plasma cystatin C, but not creatinine, is associated with measured GFR at one year after kidney transplantation

I.J.C. Dielwart[1], D. Kremer[2], D. Groothof[3], T.J. Knobbe[4], M. van Londen[5], H. Leuvenink[6], J.E. Kootstra-Ros[7], M.H. de Borst[3], R.A. Pol[6], S.J.L. Bakker[8], [1]Interne geneeskunde | chirurgie, UMC Groningen, [2]Interne Geneeskunde, Nefrologie, UMC Groningen, [3]Interne geneeskunde, UMC Groningen, [4]Interne geneeskunde, Nefrologie, UMC Groningen, [5]Nefrologie, UMC Groningen, [6]Chirurgie, UMC Groningen, [7]Laboratoriumgeneeskunde, UMC Groningen, [8]Interne Geneeskunde, UMC Groningen, Nederland.

11.25 The value of abdominal CT-scan in deceased organ donor screening

J.W. Mensink[1,2], J.C. Korving[3], K.A. Chotkan[4,5], W.N. Nijboer[6], L.F.M. Beenen[7], H. Putter[8], M.C.G. van de Poll[9], A. Baranski[4], R.A. Pol[10], A.E. Braat[4], [1]Dept. of Surgery, Division of Transplantation, Leiden University Medical Center, Leiden, [2]Dept. of Surgery, Division of Transplantation, Dutch Transplant Foundation, Leiden, [3]Dept. of Radiology, Reinier de Graaf, Delft, [4]Heelkunde, Leids Universitair Medisch Centrum, Leiden, [5]Heelkunde, Nederlandse Transplantatie Stichting, Leiden, [6]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, [7]Dept. of Radiology, Amsterdam University Medical Center, Amsterdam, [8]Biomedical Data Sciences, LUMC, Leiden, [9]Intensive Care, Maastricht University Medical Center, Maastricht, [10]Chirurgie, UMC Groningen, Nederland.

11.35 Pre transplant residual diuresis and oxalic acid concentration significantly and independently influence kidney graft survival.

G. Post Hospers[1], M. Laging[2], W.J. Visser[3], J.G.H.P. Verhoeven[4], P.M. Miranda Afonso[5], I.R.A.M. Mertens zur Borg[6], D.A. Hesselink[7], A.M.E. de Mik-van Egmond[8], M.G.H. Betjes[9], M. van Agteren[4], D. Severs[4], J. van de Wetering[7], R. Zietse[4], M.J. Vos[10], I.P. Kema[10], M.L. Kho[11], M.E.J. Reinders[7], J.I. Roodnat[12], [1]Transplant Institute, Erasmus Medical Center,, [2]Interne Geneeskunde, Erasmus MC, Rotterdam, [32]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center,, [4]Transplant Institute, Erasmus Medical Center, Rotterdam, [5]Biostatistiek, Erasmus MC, Rotterdam, [65]Dept. of Anesthesiology, Erasmus Medical Center, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [82]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center;, [9]Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, [10]Clinical Chemistry Metabolic diseases, Groningen, [11]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, [12]Nefrologie, Erasmus MC, Rotterdam, Nederland.

11.45 Peri-transplant damage impacts early immune activation following kidney transplantation.

R.C. Dijkland[1], H. Putter[2], H.S. Spijker[3], I.P.J. Alwayn[4], J.H.N. Lindeman[1], D.K. de Vries[5], [1]Heelkunde, LUMC, Leiden, [2]Biomedical Data Sciences, LUMC, Leiden, [3]Interne Geneeskunde, LUMC, Leiden, [4]Heelkunde, divisietransplantatie, LUMC, Leiden, [5]Heelkunde, LUMC, Nederland.

11.55 The superiority of Double-J Stenting in kidney transplantation

C.A.J. Oudmaijer[1], K. Muller[1], J.N.M. IJzermans[1], T. Terkivatan[1], E. van Straalen[1], R.C. Minnee[2], H.J.A.N. Kimenai[2], [1]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, [2]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, Nederland.

12.05 Lifestyle intervention to improve physical fitness and health-related quality of life after kidney transplantation: the active care after transplantation (ACT) randomized clinical trial.

T.J. Knobbe[1], D. Kremer[2], D.Z. Zelle[3], G. Klaassen[3], I.M.Y. van Vliet[4], P.B. Leurs[5], F.J. Bemelman[6], M.H.L. Christiaans[7], S.P. Berger[1], G.J. Navis[2], S.J.L. Bakker[8], E. Corpeleijn[9], [1]Interne geneeskunde, Nefrologie, UMC Groningen, [2]Interne Geneeskunde, Nefrologie, UMC Groningen, [3]Interne geneeskunde, Nefrologie, University Medical Center Groningen, [4]Dietitiek, UMC Groningen, [5]Interne geneeskunde, Nefrologie, Admiraal de Ruyter Ziekenhuis, Goes, [6]Nefrologie, Amsterdam UMC, Amsterdam, [7]Nefrologie, Maastricht UMC+, Maastricht, [8]Interne Geneeskunde, UMC Groningen, [9]Epidemiologie, University of Groningen, Nederland.

12.15 Are recipients happy with Self-Care after Renal Transplantation (SECRET)? A retrospective evaluation of protocol adherence, continuation and opinions of the Home-Monitoring System

B. Hezer[1], M.E.J. Reinders[2], M.W.F. van den Hoogen[3], M. Tielen[4], J. van de Wetering[2], D.A. Hesselink[2], E.K. Massey[5], [1]Internal Medicine, MC Transplant institute, Nephrology and Transplant at, Erasmus MC, Rotterdam, [2]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation,, Erasmus MC, Rotterdam, [5]Erasmus MC Transplant Institute, Dept of Internal Medicine, Erasmus MC, Rotterdam, Nederland.

12.25 Parenthood after kidney and liver transplantation: perspectives from both parents and their children
J.R. Meinderts[1], C. van Weezel[1], L.X.Y. ten Have[1], D. Winter[1], F.G.I. van Vilsteren[2], S.P. Berger[3], J.R. Prins[4], A.V. Ranchor[5], M.F.C. de Jong[1], [1]Interne Geneeskunde, onderafdeling Nefrologie, UMC Groningen, [2]Maag-darm-leverziekten, UMC Groningen, [3]Interne geneeskunde, Nefrologie, UMC Groningen, [4]Obstetrie en Gynaecologie, UMC Groningen, Gezondheidswetenschappen, sectie Gezondheidspsychologie, UMC Groningen, Nederland.

Parallelsessie IX: Lever – Pancreas

Locatie: Club Nine

Voorzitter: Dr. Caroline den Hoed en Dr. Dorottya de Vries

11.15 Antiplatelet prophylaxis reduces the risk of early hepatic artery thrombosis following liver transplantation in high-risk patients.
S. Darwish Murad[1], I. Minciuna[1], J. de Jonge[2], C. den Hoed [1], R. Maan[1], W.G. Polak[3], R.J. Porte[3], H.L.A. Janssen[1], B. Procopet[4], [1]MDL, Erasmus MC Transplant Institute, Rotterdam, [2]Surgery, Erasmus MC, Rotterdam, [3]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland, [4]MDL, Regional Institute of Gastroenterology and Hepatology "O. Fodor", Cluj-Napoca, Roemenië.

11.25 Natural history of early onset extrahepatic portal vein occlusion after pediatric liver transplantation; results of the PORTAL registry
L. Sieben[1], B.A. Alfares[2 I 3], R.H.J. de Kleine[4], H.J. Verkade[5], R.A.J. Dierckx[6], R.P.H. Bokkers[7], H.P.J. van der Doef[8], PORTAL registry investigators[9], [1]Pediatrics, division of pediatric gastroenterology and hepatology, University Medical Centre Groningen, [2]Dept. of Radiology, University Medical Centre Groningen, Nederland. [3]Dept. of Radiology, King Faisal Specialist Hospital and Research Center, Riyadh, Saoedi-Arabië, [4]Division of Hepatobiliary Surgery & Liver Transplantation, Dept. of Surgery, University Medical Centre Groningen, [5]Division of Pediatric Gastroenterology and Hepatology, Dept. of Pediatrics, University Medical Centre Groningen, [6]Dept. of Nuclear Medicine and Molecular Imaging, Medical Imaging Center, University Medical Centre Groningen, [7]Dept. of radiology, Medical Imaging Center, UMC Groningen, [8]Division of Pediatric Gastroenterology and Hepatology, Dept. of Pediatrics, UMC Groningen, Nederland, [9]PORTAL Registry.

11.35 13C-Methacetin breath test enables assessment of liver function during hypothermic oxygenated machine perfusion.
E.H. Küçükerbil[1], I.J. Schurink[1], J.W. Willemse[1], P.C. Groen[1], S.L. Luijmes[1], R. Broere[1], F.J. van der Heijden[1], F.H.C. de Goeij[1], S. Darwish Murad[2], L.J.W. van der Laan[1], W.G. Polak[3], R.J. Porte[3], J. de Jonge[4], [1]Heelkunde, [2]MDL, Erasmus MC Transplant Institute, Rotterdam, [3]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, [4]Surgery, Erasmus MC, Rotterdam, Nederland.

11.45 A meta-analysis comparing viability assessment criteria during normothermic machine perfusion and transplant outcomes of DCD and DBD livers.
A.M.P. den Dekker[1], A. Franssen[1], J.B. Doppenberg[1], I.P.J. Alwayn[2], [1]LUMC transplant center, Leiden University Medical center, Leiden, [2]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, Nederland.

11.55 The yield of routine post-operative Doppler ultrasound to detect early post-liver transplantation vascular complications.
S. Darwish Murad[1], I. Minciuna[1], C. den Hoed [1], A.J. van der Meer[1], M.J. Sonneveld[2], D. Sprengers[1], R.J. de Knegt[1], J. de Jonge[3], R. Maan[1], W.G. Polak[4], [1]MDL, Erasmus MC Transplant Institute, Rotterdam, [2]MDL, Erasmus MC, Rotterdam, [3]Surgery, Erasmus MC, Rotterdam, [4]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland.

12.05 Late onset hepatic artery stenosis after pediatric liver transplantation: the potential role of conservative management
W. Li[1], R.P.H. Bokkers[1], H.P.J. van der Doef[3], T. Kotsou[1], H. Hartog[2], R. Scheenstra[3], V.E. de Meijer[4], M.W. Stenekes[5], M.V. Verhagen[1], [1]Dept. of radiology, Medical Imaging Center, UMC Groningen, [2]Section of Hepatobiliary Surgery and Liver Transplantation, Dept. of Sur, UMC Groningen, [3]Division of Pediatric Gastroenterology and Hepatology, Dept. of Pediatrics, UMC Groningen, [4]Dept. of Surgery, UMC Groningen, [5]Dept. of Plastic and Reconstructive Surgery, UMC Groningen, Nederland.

12.15 Islet function loss following total pancreatectomy and islet autotransplantation (TPIAT)
M.C. Tol[1], M.A. Engelse[1], F. Carlotti[1], V.A.L. Huurman[2], E.J.P. de Koning[1], [1]Interne Geneeskunde, Leids Universitair Medisch Centrum, Leiden, [2]Chirurgie, Leids Universitair Medisch Centrum, Leiden, Nederland.

12.25 Clinical translation and implementation of a bio-artificial pancreas: a qualitative study exploring the perspectives of people with type 1 diabetes.
D. de Jongh[1], E.M. Bunnik[2], E.K. Massey[3], [1]Erasmus MC Transplant Institute, Dept. of Internal Medicine, Erasmus Medical Center, Rotterdam, [2]Dept. of Medical Ethics, Philosophy and History of Medicine, Erasmus Medical Center, Rotterdam, [3]Erasmus MC Transplant Institute, Dept of Internal Medicine, Erasmus MC, Rotterdam, Nederland.

Extra sessie:

Locatie: **PIT**

Voorzitter: *Dr. Marish Oerlemans, cardioloog, UMC Utrecht*

Thema: Screening en implementatie landelijk richtlijn TBI in transplantatie

11.15 Aanvang interactieve workshop
drs Regina Hofland en Mareille Fluitman MANP

Parallelsessie X: Infection and immunosuppression

Locatie: **Hertz**

Voorzitters: *Dr. Lianne Messchendorp en Dr. Bart Luijk*

13.30 The association between immunophenotype and the immune response following COVID-19 vaccination in kidney transplant recipients
C. Imhof[1], J.A.J. Rolwes[2], A.L. Messchendorp[1], J.S.F. Sanders[3], D. van Baarle[2], M. van der Heiden[2], [1]Nefrologie, UMCG, Groningen, [2]Medische microbiologie, UMCG, Groningen, [3]Nefrologie, UMC Groningen, Nederland.

13.39 Cross-reactivity of SARS-CoV2 vaccination-induced T cells with allogeneic HLA
G.E. Karahan[1], E. Meer-Prins[1], J. Anholts[1], I. Gille[1], N. Mulling[1], R. Arens[1], S. Heidt[2], [1]Immunology, Leiden University Medical Center, Leiden, [2]Immunologie, LUMC, Leiden, Nederland.

13.48 Influence of cellular immunity against Cytomegalovirus on the presence of active infections after solid organ transplantation
F.M. Verduyn Lunel, Medische Microbiologie, UMC Utrecht, Nederland.

13.57 Adverse outcomes after different lymphocyte-depleting therapies for T cell-mediated kidney transplant rejection
L.K. van Vugt[1 / 2], E. Tegzess[3], M. van der Zwan[4], B. de Winter[5], M.C. Clahsen-van Groningen[6], M.E.J. Reinders[7], J.S.F. Sanders[8], S.P. Berger[9], D.A. Hesselink[7], [1]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [2]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC Transplant Institute, Rotterdam, [3]Dept. of Internal Medicine, Division of Nephrology, UMC Groningen, [4]Dept. of Internal Medicine, A Schweitzer Hospital Dordrecht, Dordrecht, [5]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [6]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Nefrologie, UMC Groningen, [9]Interne geneeskunde, Nefrologie, UMC Groningen, Nederland.

14.06 Conversion to belatacept in kidney transplantation: the Rotterdam experience
G.N. de Graav[1], J.I. Roodnat[1], D.A. Hesselink[2], [1]Nefrologie, Erasmus MC, Rotterdam, [2]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam.

14.15 The tacrolimus concentration-to-dose ratio correlates to kidney function after heart transplantation
M.R. Schagen[1 / 2], T.B. Petersen[3 / 4], B.C.A. Seijkens[5], J.J. Brugts[6], K. Caliskan[6], A.A. Constantinescu[6], B. de Winter[7], I. Kardys[3 / 4], D.A. Hesselink[8], O.C. Manintveld[9], [1]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [2]Internal Medicine, Division of Nephrology and Transplantation, Rotterdam Clinical Pharmacometrics Group, Rotterdam, [3]Biostatistics, Erasmus MC, Rotterdam, [4]Biostatistics, Erasmus MC Cardiovascular Institute, Rotterdam, [5]Hospital Pharmacy, Erasmus MC, Rotterdam, [6]Cardiology, Erasmus MC, Rotterdam, [7]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [8]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam[9]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam.

14.24 Prediction of the intra-T lymphocyte tacrolimus concentration after kidney transplantation with population pharmacokinetic modelling
M.R. Schagen[1 / 2], S. Udomkarnjananun[3 / 4], H. Volarevic[5 / 6], D. van de Velde[5], M. Dieterich[1], M. Matic[7], C.C.B. Baan[8], M.E.J. Reinders[9], B. de Winter[10], D.A. Hesselink[9], [1]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [2]Internal Medicine, Division of Nephrology and Transplantation, Rotterdam Clinical Pharmacometrics Group, Rotterdam, Nederland, [3]Division of Nephrology, Dept. of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Bangkok, Thailand, [4]Division of Nephrology, Dept. of Medicine, Erasmus MC Transplant Institute, Rotterdam, [5]Hospital Pharmacy, Erasmus MC, Rotterdam, [6]Hospital Pharmacy, Rotterdam Clinical Pharmacometrics Group, Rotterdam, [7]Clinical Chemistry, Erasmus MC, Rotterdam, [8]Internal Medicine, Erasmus Medical Center, Rotterdam, [9]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [10]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, Nederland.

14.33 Pharmacokinetics of tacrolimus in pregnant solid organ transplant recipients: a retrospective study
P. Mian[1], J. Versluis[1], P. Mian[5], A.R. Bourgonje[2], J.R. Prins[3], D.J. Touw[1], J.R. Meinderts[4], M.F.C. de Jong[4], [1]Clinical Pharmacy and Pharmacology, UMC Groningen, [2]Gastroenterology, UMC Groningen, [3]Obstetrie en Gynaecologie, UMC Groningen, [4]Interne Geneeskunde, onderafdeling Nefrologie, UMC Groningen, [5]Clinical Pharmacy and Pharmacology.

14.42 Outcomes of kidney transplantation in people with HIV compared to HIV-negative recipients.
S. Amen[1], T. Mudrikova[2], A.D. van Zuilen[1], [1]Nefrologie, UMC Utrecht, [2]Infectieziekten, UMC Utrecht, Nederland.

Parallelsessie XI: Young Professionals

Locatie: Cloud Nine

Voorzitter: Maarten Tol, arts-onderzoeker/promovendus LUMC

13.30 Inequality of opportunity in health education
Lianne Mulder, post-doc, Julius Centrum voor Global Health, UMC Utrecht

Parallelsessie XII: Mini orals

Locatie: **Club Nine**

Voorzitters: *Dr. Maarten Christiaans en Dr. Neelke van der Weerd*

13.30 Smoking, alcohol intake and Torque Teno Virus in stable kidney transplant recipients
C.S.E. Doorenbos[1], J. Jonker[2], J. Hao[3], E.J. Gore[4], D. Kremer[5], T.J. Knobbe[6], A.A.E. de Joode[1], J.S.F. Sanders[1], O. Thaunat[7], H.G.M. Niesters[4], C. van Leer-Buter[4], S.J.L. Bakker[8], [1]Nefrologie, UMC Groningen, [2]Nefrologie, UMCG, Groningen, [3]Epidemiologie, UMC Groningen, [4]Medische microbiologie, UMCG, Groningen, [5]Interne Geneeskunde, Nefrologie, UMC Groningen, [6]Interne geneeskunde, Nefrologie, UMC Groningen, Nederland,[7]Nefrologie, Hospices Civils de Lyon, Lyon, Frankrijk, [8]Interne Geneeskunde, UMC Groningen, Nederland.

13.36 Beyond kidney donation: unveiling predictors of long-term kidney function in living donors.
M. Laging[1], T. Royaards[1], P.M. Miranda Afonso[2], J. van de Wetering[3], A.E. de Weerd[4], M.E.J. Reinders[3], R.C. Minnee[5], J.I. Roodnat[6], M.L. Kho[7], [1]Interne Geneeskunde, Erasmus MC, Rotterdam, [2]Biostatistiek, Erasmus MC, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [5]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, [6]Nefrologie, Erasmus MC, Rotterdam, [7]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, Nederland.

13.42 Dynamic release of kidney-derived urinary extracellular vesicles post-transplantation
L. Wu[1,2], W. Xu[3], D. Reijerkerk[3], D.A. Hesselink[4], C.C.B. Baan[5], K. Boer[6], [1]Dept. of Nephrology, The First Affiliated Hospital of Shaoyang University, Shaoyang, China, [2]Dept. of Nephrology, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [3]Dept. of Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, [6]Internal Medicine, Transplant Institute, Erasmus MC, Rotterdam, Nederland.

13.48 Simultaneous pancreas kidney recipients have a lower tacrolimus exposure for a similar c0 as compared to kidney only recipients.
A. Gelinck[1], S. Meziyerh[1], M. Lyousoufi[2], T. van Gelder[3], J. Kamp[4], A.P.J. de Vries[5], D.J.A.R. Moes[6], [1]Nierziekten, LUMC, Leiden, [2]Klinische Farmacie en Toxicologie, LUMC, Leiden, [3]Klinische Farmacie & Toxicologie, LUMC, Leiden, [4]Anaesthesiology, LUMC, Leiden, [5]Nierziekten, Leids Universitair Medisch Centrum, Leiden, [6]Klinische Farmacie en Toxicologie, Leids Universitair Medisch Centrum, Leiden, Nederland.

13.54 Predominant population released during normothermic machine perfusion of human kidneys prior to transplantation consists of monocytes and NK cells.
R.C. Dijkland[1], L.W.D. Knijff[2], A.S. Arykbaeva[1], J.B. Doppenberg[3], S. Heidt[4], C. van Kooten[5], I.P.J. Alwayn[6], D.K. de Vries[7], [1]Heelkunde, LUMC, Leiden, [2]Interne geneeskunde, LUMC, Leiden, [3]LUMC transplant center, Leiden University Medical center, Leiden, [4]Immunologie, LUMC, Leiden, [5]Interne Geneeskunde, LUMC, Leiden, [6]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, [7]Heelkunde, Leids Universitair Medisch Centrum, Leiden, Nederland.

14.00 Tissue-resident memory T cells in human kidney transplants have alloreactive potential.

D.M. Hullegie-Peelen[1], H. Tejeda Mora[2], M. Dieterich[1], S. Heidt[3], M.J. Hoogduijn[1], D.A. Hesselink[4], C.C.B. Baan[5], [1]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [2]Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [3]Immunologie, LUMC, Leiden, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, Nederland.

14.06 Delayed graft function after kidney transplantation: The role of residual diuresis and accumulated waste products

G. Post Hospers[1], W.J. Visser[2], J.G.H.P. Verhoeven[3], M. Laging[4], S.J. Baart[5], I.R.A.M. Mertens zur Borg[6], D.A. Hesselink[7], A.M.E. de Mik-van Egmond[8], M.G.H. Betjes[9], M. van Agteren[3], D. Severs[3], J. van de Wetering[7], R. Zietse[3], M.J. Vos[10], I.P. Kema[10], M.L. Kho[11], M.E.J. Reinders[7], J.I. Roodnat[12], [1]Transplant Institute, Erasmus Medical Center, [2]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center, [3]Transplant Institute, Erasmus Medical Center, Rotterdam, [4]Interne Geneeskunde, Erasmus MC, Rotterdam, [5]Dept. of Epidemiology and Biostatistics, Erasmus MC, Rotterdam, [6]Dept. of Anesthesiology, Erasmus Medical Center, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center, [9]Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, [10]Clinical Chemistry Metabolic diseases, Groningen, [11]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, [12]Nefrologie, Erasmus MC, Rotterdam, Nederland.

14.12 Health-related quality of life is linked to the gut microbiome in kidney transplant recipients.

T.J. Knobbe[1], J.C. Swarte[2], J.R. Björk[3], R. Gacesa[3], L.M. Nieuwenhuis[4], S. Zhang[5], A. Vich Vila[3], D. Kremer[6], R.M. Douwes[7], A. Post[8], E.E. Quint[9], R.A. Pol[10], B.H. Jansen[4], M.H. de Borst[11], V.E. de Meijer[12], H. Blokzijl[4], S.P. Berger[1], E.A.M. Festen[3], A. Zhernakova[13], J. Fu[14], H.J.M. Harmsen[15], S.J.L. Bakker[8], R.K. Weersma[4], [1]Interne geneeskunde, Nefrologie, UMC Groningen, [2]Interne geneeskunde, Nefrologie & Maag-, darm-, leverziekten, UMC Groningen, [3]Maag-, Darm, en Leverziekten en Genetica, UMC Groningen, [4]Maag-, Darm, en Leverziekten, UMC Groningen, [5]Maag-, Darm, en Leverziekten, [6]Interne Geneeskunde, Nefrologie, UMC Groningen, [7]Maag-, Darm, en Leverziekten en Interne Geneeskunde, Nefrologie, UMC Groningen, [8]Interne Geneeskunde, UMC Groningen, [9]Chirurgie, UMC Groningen, [10]Chirurgie, UMC Groningen, [11]Interne geneeskunde, UMC Groningen, [12]Dept. of Surgery, University Medical Center Groningen, [13]Genetica, UMC Groningen, [14]Genetica en Kindergeneeskunde, UMC Groningen, [15]Microbiologie en infectiepreventie, UMC Groningen, Nederland.

14.18 Lipid-lowering effect of rosuvastatin compared to other statins post-heart-transplantation.

B.C.J. van Dijk[1], D. Bos[2], S. Roest[1], M.M. Goedendorp-Sluimer[1], J.J. Brugts[1], A.A. Constantinescu[1], R.M.A. van der Boon[1], Y.J.H.J. Taverne[3], R.P.J. Budde[4], K. Caliskan[1], O.C. Manintveld[5], [1]Cardiology, Erasmus MC, Rotterdam, [2]Radiology & Nuclear Medicine / Epidemiology, Erasmus MC, Rotterdam, [3]Cardiothoracale Chirurgie, Erasmus MC, Rotterdam, [4]Radiology & Nuclear Medicine / Cardiology, Erasmus MC, Rotterdam, [5]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Nederland.

14.24 Living kidney donation – A narrative review of long-term psychosocial outcomes
E.K. Massey[1], A.D. Rule[2], A.J. Matas[3], [1]Erasmus MC Transplant Institute, Dept of Internal Medicine, Erasmus MC, Rotterdam, Nederland, [2]Mayo Clinic, [3]University of Minnesota, Verenigde Staten.

14.30 Functional outcomes after different lymphocyte-depleting therapies for T cell-mediated kidney transplant rejection
L.K. van Vugt[1 / 2], E. Tegzess[3], M. van der Zwan[4], B. de Winter[5], M.C. Clahsen-van Groningen[6], M.E.J. Reinders[7], J.S.F. Sanders[8], S.P. Berger[9], D.A. Hesselink[7], [1]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [2]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC Transplant Institute, Rotterdam, [3]Dept. of Internal Medicine, Division of Nephrology, UMCG, Groningen, [4]Dept. of Internal Medicine, A Schweitzer Hospital Dordrecht, Dordrecht, [5]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [6]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Nefrologie, UMC Groningen, [9]Interne geneeskunde, Nefrologie, UMC Groningen, Nederland.

14.36 The effects of an exercise training program in kidney transplant recipients on physical fitness
F. Hartgens[1], J.A. Netjes[2], A.H.M. Kooistra[3], A.D. van Zuilen[3], [1]Division Brain, Dept. of Rehabilitation, Physiotherapy Science and Sports, UMC Utrecht, [2]Revalidatie, Fysiotherapiewetenschap en Sport, UMC Utrecht, [3]Nefrologie, UMC Utrecht, Nederland.

Plenaire sessie IV: Innovatie – toekomst perspectieven

Locatie: Hertz

Voorzitter: *Dr. Arjan van Zuilen en Dr. Arnold van der Meer*

15.20 Opening en introductie sprekers

15.25 EVLP park and preserve
Dr. Niels van der Kaaij, Cardiothoracale chirurg, UMC Utrecht

15.45 Past, present and future of Car T cells
Prof. dr. Jürgen Kuball, hoofd afdeling Hematologie, UMC Utrecht

16.05 How to replace failing organs? Regenerative medicine as building blocks for the future.
Prof. dr. Joost Sluijter, Professor Cellular and Translational Cardiology, UMC Utrecht

16.25 Afronding en sluiting congres

Aanvullende informatie abstracts

Evaluating the necessity of repeating duplex ultrasound in kidney transplantation candidates: a predictive model for risk factors associated with progression of the aorto-iliac vasculature status.

L. Tofik[1], E.S. van Hattum[2], F.M. Molenaar[3], R.J. Toorop[2], A.D. van Zuilen[3], B.J. Petri[2], [1]Dept. of Nephrology and Hypertension, Dept. of Nephrology and Hypertension, University Medical Center Utrecht, Nederland. [2]Dept. of Vascular Surgery, Dept. of Vascular Surgery, University Medical Center Utrecht, Nederland. [3]Nefrologie, UMC Utrecht, Nederland.

Background: Prior to kidney transplantation, patients are assessed to determine whether the transplant procedure can be performed safely. One aspect of this evaluation includes assessing the arterial patency of the iliac tract. Little is known regarding the ideal method and frequency of these assessments. In our center, a duplex ultrasound (DUS) of the iliac arteries is conducted every two years leading up to the transplantation. We analyzed whether it is necessary to repeat DUS for all patients, seeking to determine if specific individuals require it more than others. This study aims to develop a prediction model for the presence of significant progressive changes in the patency of aorto-iliac segments to guide patient selection for repeating DUS evaluation.
Methods: In a retrospective analysis, patients evaluated for kidney transplantation between 2010 and 2022 were assessed. Patients with repeated DUS were included, and progressors were identified as those exhibiting changes in either plaque, calcification, stenosis, or occlusion in one or more segments of the aorto-iliac tract. A prediction model was developed using multivariate logistic regression analysis.
Results: 556 patients were evaluated for kidney transplantation. 155 patients had repeated DUS imaging available, 62 patients were identified as progressors. Univariate analysis revealed significant associations with iliac progression for age (OR = 1.044, p = 0.007), coronary artery disease (OR = 2.476, p = 0.010), peripheral artery disease (OR = 6.122, p = 0.001), and smoking (OR = 2.409, p = 0.009). Other variables, including sex, cause of kidney failure, diabetes, dialysis, previous NTX, cerebrovascular disease, medication, and BMI, showed no statistical significance. The multivariate model included age, sex, diabetes, coronary artery disease, peripheral artery disease, and smoking. Peripheral artery disease appeared to be the only independent significant predictor of progressive changes in the aorto-iliac tract (OR = 4.743, p = 0.007). Multivariate analysis of models that exclude peripheral artery disease revealed no additional significant predictors.
Conclusions: Peripheral artery disease was identified as the primary risk factor for transplant candidates who are more likely to develop changes in the arterial status of aorto-iliac segments. This confirms the need for patient selection and will aid in the development of an algorithm to identify patients who need to be screened regularly.

Decoding ureteral obstructions post-kidney transplantation: risk factor analysis

S. Truijen[1], M.T.W.T. Lock[2], A.D. van Zuilen[3], R.J. Toorop[4], E.S. van Hattum[4], B.J. Petri[4], L.M.O. de Kort[2], [1]Geneeskunde, Universiteit Utrecht, [2]Urologie, UMC Utrecht, [3]Nefrologie, UMC Utrecht, [4]Dept. of Vascular Surgery, Dept. of Vascular Surgery, University Medical Center Utrecht, Nederland.

Background: Ureteral obstructions remain a challenging complication after kidney transplantation and often require surgical revision. The purpose of this study is to report the incidence of ureteral obstructions two years post-kidney transplantation, to identify risk factors for developing ureteral obstructions in the kidney transplant population and demonstrate our management approach.
Methods: In this retrospective study we report the incidence of ureteral obstructions post-kidney transplantation using data from all kidney transplantations performed between January 2016 and December 2021 (n = 404). We analyzed the incidence, patient demographics and management approach. We included patients who got diagnosed with a ureteral obstruction within a period of two years after transplantation.
Results: 19 (4.7%) patients developed a ureteral obstruction within two years post-kidney transplantation. The majority (84.2%) occurred in the distal ureter. 14 obstructions (73.7%) were diagnosed <90 days. The univariate analysis showed a significant correlation between history of a vascular event (p = 0,010), type of donor (p = 0,029), and Cold Ischaemia Time (CIT) (p = 0,036) and the formation of ureteral obstructions post-kidney transplantation. There was no significant difference found in the patient, donor or obstruction characteristics between the patients treated with minimally invasive versus open surgical approach.
Conclusions: We conclude that the incidence of ureteral obstructions post-kidney transplantation in our centre is compatible with the incidence in the literature. The finding that the majority of the ureteral obstructions were located in distally also aligns with that of the literature. The univariate analysis showed that history of vascular event, type of donor, and CIT were found to significantly correlate with the formation of ureteral obstructions post-kidney transplantation. Our centre used various management techniques successfully. There was no significant difference in the recurrence rate of ureteral strictures between the minimally invasive and open surgical treated patients.

Preoperative dietary intake of sulphoraphane induces no clinically significant effect in living donor kidney transplantation.

C.A.J. Oudmaijer[1], R.W.F. de Bruin[1], T. Terkivatan[1], J.N.M. IJzermans[1], L.S.S. Ooms[2], J.W. Selten[1], E. van Straalen[1], G.A. Ambagtsheer[3], [1]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, [2]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, [3]Surgery Dept., Erasmus MC, Rotterdam, Nederland.

Background: Sulphoraphane (SFN) has anti-inflammatory properties and is found in broccoli sprouts. Studies suggest that it protects against disease due to its anti-inflammatory activity. Furthermore, broccoli consumption has been found to reduce the expression of markers associated with endothelial inflammation. Despite these promising findings, the effects of SFN have not been extensively studied in humans, especially in the context of surgical procedures.
Objective: To explore the effect of dietary SFN in living kidney donors on the postoperative inflammatory response and postoperative recovery.
Methods: We performed a double-blind randomised controlled trial where living kidney donors followed a SFN-enriched preoperative diet. Study participants underwent the same preoperative screening and workup as non-participants opting for living kidney donation. After obtaining informed consent, all study participants were randomly assigned to either Diet 1 or Diet 2 using a randomised envelope system. Both groups received standardized food boxes for 5 days and were instructed to avoid SFN-containing vegetables. The intervention group additionally consumed 8 grams of broccoli sprouts minced in 250 mL water daily for 5 preoperative days, corresponding to a daily intake of 8 mg of SFN. Donors in the control group consumed 8 grams of butter lettuce minced in 250 mL water during the 5 preoperative days and were therefore blinded to the active substance. The primary endpoint was the effect of randomisation on postoperative inflammatory response in the donor, measured by markers of the acute phase response.
Results: In this study, 111 donors were screened for eligibility and 99 were deemed eligible. A total of 42 donors were included, with no significant differences at baseline. Postoperative inflammatory response was consistent among both arms; it did not differ before and after the diet, but was increased in both groups on all postoperative days. Subjective recovery showed no statistical significant difference. Findings regarding postoperative kidney function suggest no consistent clinically significant impact.
Conclusions: A well-defined SFN-enriched diet did not have an anti-inflammatory or a clinically relevant effect on the outcome. Due to the complexity of dietary modification of the inflammatory response, additional preclinical research is needed.

Improving data quality and quantity of the Dutch living kidney donor registry

M. van Londen[1], L.B. Hilbrands[2], S.A. Nurmohamed[3], M.H.L. Christiaans[4], A.D. van Zuilen[5], V.A.L. Huurman[6], A.C. Hemke[7], C. Konijn[8], J.S.F. Sanders[1], J.I. Roodnat[9], S.P. Berger[10], M.L. Kho[11], [1]Nefrologie, UMC Groningen, [2]Nefrologie, Radboudumc, Nijmegen, [3]Nefrologie, Amsterdam Universitair Medisch Centrum, Amsterdam, [4]Nefrologie, Maastricht UMC+, [5]Nefrologie, UMC Utrecht, [6]Chirurgie, Leids Universitair Medisch Centrum, Leiden, [7]Beleid, Nederlandse Transplantatie Stichting, Leiden, [8]Informatiemanagement, Nederlandse Transplantatie Stichting, Leiden, [9]Nefrologie, Erasmus MC, Rotterdam, [10]Interne geneeskunde, Nefrologie, UMC Groningen, [11]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, Nederland.

Background: To ensure a safe and successful living kidney donor program, registration of donor outcomes is important. Although living donation is a cornerstone of the Dutch kidney transplant program, long-term outcomes of Dutch donors are often not available, leaving questions on donor follow-up and long-term safety of kidney donation unanswered.
Methods: In this project, we aimed to improve the data quality and quantity of the Dutch Living Kidney Donor Registry (LDR). We performed analyses on the completeness and correctness of the LDR and analysed the processes of the Dutch Transplant Foundation (NTS) and the Dutch Transplant centers using an Ishikawa diagram and queries to detect incorrect entries. Furthermore, in collaboration with the Dutch Kidney Patients Association (NVN) we conducted focus sessions with donors, gaining insights regarding donor perspective on (long-term) follow-up and data use. Subsequently, we formulated recommendations to increase the quantity and improve the quality of the data in the LDR, which were partially implemented during the project.
Results: At the start of the project, the LDR consisted of 36453 initial and follow-up records from 8519 Dutch donors. The overall number of complete records amounted to 69% nationally, with large differences between centers (23-91%). During the project (2020 to 2022), this increased to 77% (59-94%), with the largest improvement in data completeness for short-term outcomes (from 74 to 78% for <5-year post-donation). Analysis of correctness showed a total of 26 (0.07%) faulty entries. Based on the process analyses, the following recommendations were formulated for further improvement: attract a data manager, actively call donors, use standardized invitations for donor follow-up, and automatically upload data to the LDR. Furthermore, centers are advised to better inform donors about the need for follow-up.
Conclusions: In a project dedicated to improving the registration of follow-up data for living kidney donors, we successfully increased the number of complete records in the LDR, by increasing the awareness for follow-up and formulating recommendations to improve donor follow-up. With the improved LDR, we next aim to evaluate the long-term safety of living kidney donation in the Netherlands.

Dynamic changes in serum calcification propensity (t50) after kidney transplantation

D. Kremer[1], C.A. te Velde-Keyzer[1], T.J. Knobbe[2], S.J.L. Bakker[3], A. Pasch[4], G.J. Navis[1], J.L. Hillebrands[5], M.H. de Borst[6], I.N.V. TransplantLines Investigators[7], [1]Interne Geneeskunde, Nefrologie, UMC Groningen, [2]Interne geneeskunde, Nefrologie, UMC Groningen, [3]Interne Geneeskunde, UMC Groningen, Nederland, [4]-, Calciscon AG, Biel, Zwitserland, [5]Pathologie, UMC Groningen, [6]Interne geneeskunde, UMC Groningen, [7]Transplantatiecentrum, UMC Groningen, Nederland.

Background: Calciprotein particle maturation time (T50) is a valuable marker of *ex vivo* serum calcification propensity. Low T50 (*i.e.*, high calcification propensity) is associated with cardiovascular and all-cause mortality in kidney transplant recipients (KTR). This study expands the scope by assessing longitudinal variation in T50 in KTR.
Methods: Serum T50 was measured in patients enrolled in the TransplantLines Biobank and Cohort Study pre-transplantation, and at three and six months and at one, two, three and five years after kidney transplantation. We assessed T50 trajectories over time, and explored associations of clinical factors with changes in T50 using general linear mixed models.
Results: In total, we included 836 patients (62% male, age 55±14y, 46% pre-emptive). Prior to transplantation, mean T50 was 234±83 min, which increased to 339±64 min at three months post-transplantation ($P_{\text{Paired T-test}}<0.001$) and to 347±66 min at six months after transplantation ($P_{\text{Paired T-test vs. 3 months}}<0.001$). After this time point, this post-transplant improvement (*i.e.*, reduced calcification propensity) was sustained throughout follow-up ($P_{\text{Paired T-test vs. 6 months}}>0.05$ for all). The intra-individual coefficient of variation in the first year was 8.5% [IQR: 5.3% to 13.0%]. In mixed models analyses with time-updated values, key findings were that higher plasma concentrations of phosphate (T-value: -21.1), lower plasma concentrations of hemoglobin (T-value: 12.2), magnesium (T-value: 10.9), calcium (T-value: 10.6) and albumin (T-value: 6.6), and lower eGFR (T-value: 9.0) were associated with less T50 improvement (P<0.001 for all). In addition, higher age (T-value: -5.7) and post-mortal donor state (T-value: -4.5) were associated with less T50 improvement (P<0.001 for both). The T50 trajectories were similar for males and females.
Conclusions: Serum calcification propensity strongly improves after kidney transplantation, and this improvement persists in the following years. The low intra-individual variation of T50 over time underscores the validity and potential utility of this marker as an indicator of vascular health and calcification risk in KTR. High phosphate, low hemoglobin, low magnesium and low calcium showed the strongest associations with less improvement of serum calcification propensity. Investigation of the mechanisms driving these changes and exploration of their broader clinical implications is warranted.

A carbon-13-labeled pyruvate test as real-time metabolic assessment of ex-situ perfused donor hearts

S.J.J. Langmuur[1], E.H. Küçükerbil[2], J.H. Amesz[1], O.C. Manintveld[3], J. de Jonge[4], Y.J.H.J. Taverne[1], [1]Cardiothoracale Chirurgie, Erasmus MC, Rotterdam, [2]Heelkunde,[3]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam, [4]Surgery, Erasmus MC, Rotterdam, Nederland.

Background: Quality assessment during ex-situ heart perfusion (ESHP) is important, especially when using marginal donor hearts. Currently, lactate is the only metabolic parameter used to assess quality, but does not always reliably predict graft function. Pyruvate is involved in major energy-generating metabolic pathways, being converted to acetyl-CoA, used for oxidative phosphorylation, and CO_2. This study investigated the use of a 1-^{13}C-pyruvate test as novel ESHP assessment parameter.
Methods: Five porcine slaughterhouse hearts were perfused in a normothermic ESHP model for 8 hours (coronary blood flow (CBF): 800-1000 mL/min, aortic pressure (AoP): 60-80 mmHg), interrupted by 40 min of hypoperfusion (CBF: 300-400 mL/min, AoP: 30-40 mmHg). The ratio between the produced $^{13}CO_2$ and $^{12}CO_2$ was continuously measured. Two boluses of 1-^{13}C-pyruvate were added: 1 hour after reperfusion and 20 min after hypoperfusion, respectively. Each heart served as its own control and lactate levels were related to changes in $^{13}CO_2$:$^{12}CO_2$ ratio.
Results: Lactate trends decreased before (median -1.69 mM/h [range -3.0 to -1.3]) and stabilised or increased after hypoperfusion (+0.13 mM/h [-0.04 to +1.4], p=0.06). In 4/5 hearts, the maximum increase in $^{13}CO_2$:$^{12}CO_2$ ratio from baseline (DoB_{max}) was higher before (36.6 [27.0 to 40.5]) as compared to after hypoperfusion (32.6 [range 17.5 to 35.5]), although non-significant (p=0.19). The relative difference in DoB_{max} was -16.4% [-35.5% to 20.67%]. Time to peak was similar (80 min [58 to 98] vs. 76 min [48 to 96], p=0.31). Pearson's r was 0.76 (p=0.14) for the correlation between lactate trends and DoB_{max} before hypoperfusion.
Conclusions: This study shows the feasibility of performing a ^{13}C-labeled pyruvate test during normothermic ESHP as novel metabolic quality assessment marker. Although more research is needed, ^{13}C-measurements may be able to distinguish between hearts with an altered aerobic capacity and could display a more tailored metabolic cardiac profile.

Preoperative amiodarone use does not affect pacemaker implantation after heart transplantation.

A.E. Vels[1], L.C. Kieviet[2], M.K. Szymanski[2], M.G. Van der Meer[2], N.P. van der Kaaij[3], L.W. van Laake[4], A.E. Tuinenburg[2], K.A. Jacob[1], E.E. van Aarnhem[1], M.I. Oerlemans[2], [1]Cardiothoracic surgery, UMC Utrecht, [2]Cardiology, UMC Utrecht, [3]Cardiothoracale chirurgie, UMC Utrecht, [4]Cardiologie, UMC Utrecht, Nederland.

Background: Following bi-atrial orthotopic heart transplantation (HTx), approximately 20% of patients require permanent pacemaker (PPM) implantation. Several risk factors, including preoperative amiodarone use have been reported, although previous studies show contradictory results. We aimed to assess the association between preoperative amiodarone use and PPM implantation in patients who underwent HTx in our medical institution.
Methods: In this retrospective, single-center observational study, all available data from HTx recipients derived from our centrum-based research data platform. Early PPM was defined as PPM within index hospitalization. Next to univariate and multivariate analyses conducted with regard to amiodarone use, survival analyses for PPM freedom and overall survival were performed, using IBM® SPSS ® 28.0.1.0. A p-value <0.05 was considered significant.
Results: In 46/197 (23.4%) patients (mean age 50.6 years, 10.2% female) who underwent HTx between 2009 and 2022, PPM implantation was required. Early PPM implantation occurred in 82,5% of these patients. Preoperative amiodarone use was observed in 41.4% of all patients. Usage did not differ between patients with or without PPM implantation (50.0% vs. 38.4%; P=0.16). Preoperative amiodarone was not predictive for PPM implantation (OR=1.37, CI=0.67-2.79, P=0.38). PPM implantation probability did not significantly differ between the groups with and without prior amiodarone use (Log-rank p-value: 0.16). Overall post-transplant survival was similar between the groups (mean follow-up 6.7 years; P=0.22).
Conclusions: In the current cohort study, nearly a quarter of the patients required PPM implantation, of which the majority was implanted early after HTx. Preoperative amiodarone use was not predictive for PPM implantation and did not influence post-transplant survival. Due to conflicting findings in prior studies, more studies seem warranted to better understand the role of amiodarone.

Elevated plasma immunoglobulin levels prior to heart transplantation are associated with poor post-transplantation survival.

P. van den Hoogen[2], S.C.A. de Jager[1], M.M.H. Huibers[3], F.W. den Dolder[4], R. de Weger[5], E. Sierra de Koning[5], M.I. Oerlemans[6], N. de Jonge[6], L.W. van Laake[7], P.A. Doevendans[8], J.P.G. Sluijter[1], A. Vink[5], [1]Experimental Cardiology, UMC Utrecht, [2]Experimental Cardiologie, UMC Utrecht, [3]Dept. of Genetics, UMC Utrecht, [4]Dept. of Pathology, [5]Dept. of Pathology, UMC Utrecht, [6]Cardiology, UMC Utrecht, [7]Cardiologie, UMC Utrecht, [8]Cardiology, Central Military Hospital, Utrecht, Nederland.

Background: Cardiac allograft vasculopathy (CAV) and antibody-mediated rejection are immune-mediated, long-term complications that jeopardize graft survival after heart transplantation (HTx). Interestingly, increased plasma levels of immunoglobulins have been found in end-stage heart failure (HF) patients prior to HTx. In this study, we aimed to determine whether increased circulating immunoglobulin levels prior to transplantation are associated with poor post-HTx survival.
Methods: Pre-and post-HTx plasma samples of 36 cardiac transplant recipient patients were used to determine circulating immunoglobulin levels. In addition, epicardial tissue was collected to determine immunoglobulin deposition in cardiac tissue and assess signs and severity of graft rejection.
Results: High levels of IgG1 and IgG2 prior to HTx were associated with a shorter survival post-HTx. Immunoglobulin deposition in cardiac tissue was significantly elevated in patients with a survival of less than 3 years. Patients with high plasma IgG levels pre-HTx also had significantly higher plasma levels after HTx. Furthermore, high pre-HTX levels of IgG1 and IgG2 levels were also significantly increased in patients with inflammatory infiltrate in CAV lesions.
Conclusions: The results of this proof-of-concept study suggest that an activated immune response prior to transplantation negatively affects graft survival.

Quantitative and functional differences in SARS-CoV-2 specific mucosal and serum antibody responses following mRNA-1273 vaccination in healthy controls and kidney transplant recipients.

V.J.C.H. Koomen[1], J. Fröberg[2], C. Gaast-deJongh[2], A.L. Messchendorp[3], F.J. Bemelman[4], C.C.B. Baan[5], D. van Baarle[6], J.S.F. Sanders[7], R.G. van der Molen[2], L.B. Hilbrands[8], D.D. Diavatopoulos[2], [1]Nierziekten, Radboudumc, Nijmegen, [2]Laboratorium Medische Immunologie, Radboudumc, Nijmegen, [3]Nefrologie, UMC Groningen, [4]Nefrologie, Amsterdam UMC, Amsterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, [6]Medische microbiologie, UMCG, Groningen, [7]Nefrologie, UMC Groningen, [8]Nefrologie, Radboud Universitair Medisch Centrum, Nijmegen, Nederland.

Background: Neutralizing antibodies play a critical role in limiting SARS-CoV-2 infection and disease by blocking the interaction of the virus spike receptor binding domain (RBD) with the angiotensin converting enzyme 2 (ACE2) receptor on human cells. Little is known about quantitative and functional differences of antibodies induced by vaccination in immunocompromised patients versus healthy controls, particularly with regards to mucosal antibodies that serve as a first line of defense. In this study, we compared the serum and nasal antibody response to primary vaccination with two doses of mRNA-1273 in healthy controls (HC) and kidney transplant recipients (KTR).
Methods: HC and KTR who received a primary mRNA-1273 vaccination schedule were included (n=50 and n=76, respectively). Serum and mucosal lining fluid (obtained with nasosorption strips) were obtained at pre-vaccination baseline, at 2nd vaccination, and 28 days and 6 months after the 2nd dose. IgG and IgA concentrations against viral antigens (spike, RBD and nucleocapsid) were quantified by multiplex immune assay. A Luminex-based ACE2 competition assay was used to assess the (pseudo)neutralizing capacity of the samples.
Results: Previously, we observed that infection-induced ACE2 binding inhibition was mainly driven by mucosal IgA, while post-vaccination ACE2 inhibition in HC was mostly dependent on mucosal IgG. Although significantly lower mucosal anti-spike IgG levels were observed in KTR compared to HC, mucosal ACE2 inhibition levels in KTR with any detectable ACE2 inhibition activity (58%) were similar to those observed in HC. A high correlation was observed between serum and mucosal anti-spike IgG levels and ACE2 inhibiting activity at 28 days after vaccination and at 6 months in both HC and KTR.
Conclusions: Bead-based analysis methods allow for sensitive quantitative and functional analysis of mucosal lining fluid, obtained via non-invasive nasosorption. Preliminary results suggest that a substantial proportion of KTR show a comparable mucosal ACE2 response to HC.

Interpretable prediction of kidney allograft rejection using machine learning: a comparison between linear and non-linear models

A.A.S. Assis de Souza[1], A.P.S. Stubbs[2], D.A. Hesselink[3], C.C.B. Baan[1], K. Boer[4], [1]Internal Medicine, Erasmus Medical Center, Rotterdam, [2]Pathology and Clinical Bioinformatics, Erasmus Medical Center, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Internal Medicine, Transplant Institute, Erasmus MC, Rotterdam, Nederland.

Background: Machine learning (ML) has been explored multiple times to predict allograft rejection with comparable performance to traditional statistical methods. However, for the implementation of ML in clinical practice, understanding how these 'black-box' models come to their prediction is needed. This study uses interpretability techniques to compare the training of linear and non-linear models to predict kidney allograft rejection in the first two weeks after kidney transplantation.
Methods: Data on donor kidney transplants and their recipients between August 2018 and December 2019 were included (N=140). The incidence of rejection in the first two weeks after transplantation was 29%. Both logistic regression and random forest models were applied using their default configuration trained on variables related to the donor, recipient, and transplantation procedure to predict the probability of a rejection episode. The estimated performance of the models was based on a repeated (10x) stratified 3-fold cross-validation procedure and assessed by the area under the receiver operating characteristic curve (ROC- AUC) and calibration curves. Shapley additive explanation (SHAP) and partial dependence plot (PDP) interpretability techniques were used to audit two final models trained on the entire dataset.
Results: Logistic regression and random forest models presented comparable mean ROC-AUC of 65% and 63%, respectively. Two of the five most important features identified by SHAP (recipient body-mass index and warm ischemia time) for model training coincided between logistic regression and random forest. However, cold ischemia time, the second most important feature for the random forest model, was not among the top predictors for logistic regression. PDP plots for the random forest revealed feature interactions that affect the risk of rejection that were not captured by logistic regression.
Conclusions: We extended the use of SHAP in the field of kidney allograft rejection prediction. We showed that although the models presented similar performance, there were differences in learning patterns between the linear and non-linear models. Our findings elucidate the need for interpretability towards the development of predictive models intended to be used in clinical practice.

Prolonged waiting time for immunized patients mainly due to blood group and non-transplantable status: a retrospective analysis to create a prediction model.

T. Tramper[1], D.L. Roelen[2], M.G.H. Betjes[3], D.A.J. van den Broek[4], G.W. Haasnoot[5], D. van der Helm[4], J.A. Kal-van Gestel[6], M.E.J. Reinders[7], J. van de Wetering[7], A.P.J. de Vries[8], A.E. de Weerd[6], [1]Nefrologie en nier-transplantatie, Erasmus MC, Rotterdam, [2]Immunologie, Leids Universitair Medisch Centrum, Leiden, [3]Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, [4]Nierziekten, Leiden University Medical Centre, Leiden, [5]HLA diagnostics laboratory, Leids Universitair Medisch Centrum, Leiden, [6]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Nierziekten, Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: The presence of antibodies to HLA limits the donor pool, and therefore the Eurotransplant allocation algorithm takes immunization into account. The aim of this study is to identify characteristics in immunized patients that prolong their waiting time for a deceased donor kidney transplantation.
Methods: All patients from our center who were listed as transplantable between 1-1-2009 and 31-12-2018 were included if they had virtual panel-reactive antibodies (vPRA) of more than 50%. The time on the waitlist was analyzed by vPRA, blood group, transplantation in the acceptable mismatch (AM) program and dialysis vintage.
Results: A total of 208 patients were included for analysis. Of these patients, 153 were transplanted, of which 102 with a deceased donor, of which 54 within the AM program. The median time to deceased donor transplantation was 2.3 years from listing as transplantable, and 3.8 years from the last start of dialysis. Patients that were waitlisted longer than 2.3 years had a median vPRA of 84%, versus 79% for those waitlisted shorter than 2.3 years (p=0.05). Of these longer waiting patients, 20% had blood group B, where this was 15% for those that waited shorter than 2.3 years. Longer dialysis vintage before waitlisting shortened time to transplantation (p <0.001). A plateau phase occurred four years after waitlisting, affecting 36% of patients. Patients that were waitlisted more than four years were registered as non-transplantable for a median period of 1.9 years within this period. Of these patients only 11 ultimately received a transplant, of which four with a deceased donor, three of which within the AM program. The seven patients receiving a living donor transplantation were all HLA or blood group incompatible.
Conclusions: Immunized patients with prolonged waiting time have higher vPRA levels, have long periods of being non-transplantable, more often have blood group B and rely on AM for deceased donor transplantations. A multivariate prediction model for the waitlisted time of immunized patients is currently constructed in R. This model will be externally validated with patients from another transplantation center.

Cost-effectiveness of Maribavir for post-transplant refractory cytomegalovirus infection: A Dutch perspective

M. van Wijk[2], T.A. van Heerde[1], P. Plasman[2], S. van Rijn[3], [1]Medical Affairs, Takeda Nederland, Hoofddorp, [2]Dept. of Real-World Evidence, HEOR, Market Access & Pricing, IQVIA Nederland, Amsterdam, [3]Patient Value & Access, Takeda Nederland, Hoofddorp.

Background: Cytomegalovirus (CMV) infection increases the risk of morbidity and mortality among solid organ or hematopoietic cell transplant (SOT/HCT) patients. Toxicities associated with various anti-CMV treatments limit their use and increase the risk of developing refractory CMV infection. In the phase 3, randomized controlled SOLSTICE (NCT02931539) study of refractory CMV infection in SOT/HCT recipients, maribavir (400 mg twice daily for 8 weeks) achieved superior efficacy with an improved safety profile (less neutropenia and acute kidney injury) against investigator-assigned therapy (IAT; valganciclovir, foscarnet, or cidofovir). Of the IAT in SOLSTICE, (val)ganciclovir is generally used as the first-line treatment in the Netherlands and cidofovir is no longer authorized for use in the European Union. Maribavir is approved and is a new option in the management of patients with refractory CMV infection over foscarnet conventionally used among in the Netherlands. This study assessed the cost-effectiveness of maribavir compared to foscarnet for the treatment of post-transplant refractory CMV from a societal perspective in the Netherlands.
Methods: The model comprises two consecutive Markov models: A three-state model wherein a 4-week cycle is used for 18 months, capturing health state transitions between clinically significant CMV, non-clinically significant CMV and dead. From 18 months onwards, patients move to a two-state, alive/dead model with annual cycles. The cost-effectiveness was assessed for 53-year-old patients of which 60% received SOT and 40% received HCT, based on the patient population in SOLSTICE from a Dutch societal perspective.
Results: The results of this analysis suggest that treatment with maribavir is associated with an incremental cost of €7,015, an incremental quality-adjusted life year (QALY) gain of 0.19, and an incremental life year gain of 0.20 compared to foscarnet. With a corresponding incremental cost-effectiveness ratio (ICER) of €37,384 per QALY, maribavir is considered cost-effective at a willingness-to-pay reference value of €50,000. Scenarios testing the impact of vial sharing, alternative foscarnet and maribavir treatment durations, and a third-line treatment, also indicated that maribavir is a cost-effective, or dominant, alternative compared to foscarnet.
Conclusions: This analysis supports that maribavir is a cost-effective alternative to foscarnet for the treatment of post-transplant refractory CMV infection from a societal perspective in the Netherlands.

High density lipoprotein particles in stable outpatient kidney transplant recipients

J. Jonker[1], D. Kremer[2], E.J. Gore[3], H.G.M. Niesters[3], C. van Leer-Buter[3], P. Bourgeois[4], M.A. Connelly[5], S.P. Berger[6], J.S.F. Sanders[7], S.J.L. Bakker[8], [1]Nefrologie, UMCG, Groningen, [2]Interne Geneeskunde, Nefrologie, UMC Groningen, [3]Medische microbiologie, UMCG, Groningen, Nederland, [4]Molecular Virology, BioMérieux, Verniolle, Frankrijk, [5]Diagnostics Research & Development, Labcorp, Morrisville, Verenigde Staten, [6]Interne geneeskunde, Nefrologie, UMC Groningen, [7]Nefrologie, UMC Groningen, [8]Interne Geneeskunde, UMC Groningen, Nederland.

Background: Torque teno virus (TTV) is emerging as a potential marker for monitoring the immune status. TTV load measurement may aid in optimizing immunosuppressive medication dosing in solid organ transplant recipients. Additionally, there is growing interest in the role of HDL particles on the immune function. This study investigated the association between HDL subspecies and TTV load.
Methods: We included 656 stable outpatient kidney transplant recipients at least one year post-transplantation, enrolled in the TransplantLines Food and Nutrition Cohort (Groningen, The Netherlands). Plasma HDL particles and subfractions were measured by nuclear magnetic resonance spectroscopy. Plasma TTV load was measured using polymerase chain reaction. We examined associations between HDL parameters and TTV load using univariable and multivariable linear regression.
Results: Among 656 transplant recipients, 539 (82.2%) had a detectable TTV load. In this group, the mean TTV load was 3.04 (± 1.53) $\log_{10}$ copies/mL. The median age was 54.6 [IQR: 44.6 to 63.1] years, 43.3% were female, mean eGFR was 52.5 (±20.6) mL/min/1.73m^2 and median allograft vintage was 5.4 [IQR: 2.0 to 12.0] years. The mean total HDL particle concentration was 19.7 (±3.4) µmol/L and mean HDL size was 9.1 (±0.5) nm. Univariable linear regression revealed a significant negative association between total HDL particle concentration and TTV load (st.β=-0.17, 95% CI st.β: -0.26 to -0.09, P<0.001). Effect-modification of smoking behaviour influencing the association between HDL particle concentration and TTV load was observed ($P_{interaction}$=0.024). After adjustment for age, sex, alcohol intake, hemoglobin, eGFR, donor age, allograft vintage and the use of calcineurin inhibitors, the negative association between HDL particle concentration and TTV load remained statistically significant in the non-smoking population (st.β=-0.14, 95% CI st.β: -0.23 to -0.04, P=0.006).
Conclusions: Higher HDL particle concentrations were associated with a lower TTV load, indicative of a higher immune function. Interventional studies are needed to provide causal evidence on the role of HDL on the immune system.

A simple scoring system during normothermic machine perfusion may salvage kidneys initially declined for transplantation.

Y.F. Fang[1], G.A. Ambagtsheer[1], R.C. Minnee[2], R.W.F. de Bruin[3], [1]Surgery Dept., Erasmus MC, Rotterdam, [2]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, [3]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: A significant proportion of kidneys procured from postmortal donors are discarded due to concerns of quality. Normothermic machine perfusion (NMP) provides a platform to assess kidney quality prior to transplantation. In this study NMP was used as an assessment tool to investigate the quality of human kidneys declined for transplantation.
Methods: Data from 40 human kidneys undergoing NMP before transplantation were analyzed to identify thresholds for renal blood flow and urine output, based on graft survival. These thresholds, combined with the donor type (expanded criteria donor, or not), were integrated into a kidney quality assessment score ranging from highest quality, 1, to lowest, 4). This scoring system was applied to a series of 14 discarded human kidneys undergoing 60 min of NMP with an oxygenated red cell-based solution at 37°C.
Results: In the 40 transplanted kidneys, the scores ranged between 1 and 3 (score 1: 4; score 2: 27; score 3: 9). The death-censored graft survival was 90% and 67% in kidneys scoring 1-2 and 3, respectively (P = 0.017). The delayed graft function rate was 45% (14 of 31) in kidneys scoring 1-2, and 67% (6 of 9) in those scoring 3 (P = 0.45). In the discarded kidney series, 5 (36%) scored 1-2, and 9 (64%) scored 3, suggesting that these kidneys were eligible for transplantation.
Conclusions: Although none of these discarded kidneys were transplanted, these data suggest that kidneys with a score of 1-2, should be considered for transplantation.

Heart donation and transplantation of circulatory death donors: the Dutch experience

N.P. van der Kaaij[1], *O.C. Manintveld*[2], *Y.J.H.J. Taverne*[3], *A.E.T. Snijders*[1], *K. Damman*[4], *L.W. van Laake*[5], *M.E. Erasmus*[6], *[1]Cardiothoracale chirurgie, UMC Utrecht, [2]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam, [3]Cardiothoracale Chirurgie, Erasmus MC, Rotterdam, [4]Cardiologie/Transplantatie instituut, UMC Groningen, [5]Cardiologie, UMC Utrecht, [6]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen, Nederland.*

Background: Shortage of donor hearts can be reduced using hearts of circulatory death donors. In 2015, initiatives were taken to start a DCD heart transplantation program in the Netherlands. On the 15th of March 2021, a national program started using the Direct Procurement and Perfusion approach. Here we report the outcomes of DCD heart transplantation in the Netherlands as compared to the outcomes after DBD heart transplantation.
Methods: After confirmation of death and respecting a five minute no touch period, DCD donors were transferred to the operation room, a sternotomy was performed, blood was collected, cardioplegia administered and the heart excised. Hearts were normothermically reperfused with donor blood on the Organ Care System (OCS) of Transmedics, transferred on the OCS to recipient centers and implanted. All essential time points and all relevant donor and recipient factors were recorded. Outcome assessment included survival, incidence of primary graft dysfunction (PGD), postoperative extra corporeal life support (ECLS), rejection, and acute kidney injury (AKI) requiring dialysis. The DCD cohort was compared to the cohort patients that were transplanted with DBD hearts between January 1st 2020 and October 2023. Cox proportional hazards regression was performed to identify risk factors for mortality after heart transplantation.
Results: Between March 2021 and November 2023, 108 DCD procedures were attended of which 89 did proceed to donation; 14 hearts were declined for transplantation (9 technical issues, 2 suspicion of abdominal malignancy, and 3 graft quality) and 79 DCD hearts were transplanted (retrieval rate 73%). Between January 2020 and November 2023, 104 DBD hearts were transplanted. DBD donors were older than DCD donors (median 47 years (range 14-66) versus 37 years (range 15-58)). DCD heart recipients were more often supported by LVAD therapy (64% versus 47%) and had shorter ischemic intervals (mean 157+/-41 minutes versus 196+/-52 minutes). Although the incidence of severe PGD, postoperative ECLS and dialysis were comparable between DBD and DCD recipients, the survival of DCD heart recipients was superior (96% versus 80%) with a maximum follow-up of 32 months. Recipient BMI (Hazard ratio (HR) 1.11 P=0.035), donor age (HR 1.04 P=0.023) and transplantation of a DBD heart (HR 3.26 P=0.059) were identified as predictors of mortality in the final multivariable Cox regression model.
Conclusions: Implementation of a DCD heart donation and transplantation program in the Netherlands resulted in 79 extra heart transplantations within a period of 32 months with superior survival to DBD heart recipients.

Ten years of quality monitoring of abdominal organ procurement in the Netherlands and its impact on transplant outcome

K.A. Chotkan[1,2], I.P.J. Alwayn[3], A.C. Hemke[4], A. Baranski[1], W.N. Nijboer[3], J. Deggens[4], R.A. Pol[5], A.E. Braat[1], [1]Heelkunde, Leids Universitair Medisch Centrum, Leiden, [2]Heelkunde, Nederlandse Transplantatie Stichting, Leiden, [3]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, [4]Beleid, Nederlandse Transplantatie Stichting, Leiden, [5]Chirurgie, UMC Groningen, Nederland.

Background: This nation-wide study involves a comprehensive analysis of 10 years' worth of procurement quality monitoring data. The primary objective is to identify potential risk factors associated with procurement-related injury and investigate their association with long term graft survival.
Methods: A retrospective analysis including all deceased kidney, liver and pancreas donors from March 2012 (January 2014 for pancreas donors) to December 2022, along with their corresponding recipients in the Netherlands, was conducted. The incidence of procurement related injury, as documented by the procuring and transplanting surgeon, were systematically analyzed to find potential risk factors. Kaplan-Meier Survival analyses were used to assess the impact on graft survival.
Results: Of the total abdominal organs procured, 23% exhibited procurement-related injuries, which led to the discard of 4.0% of procured organs. In kidney and liver procurement specific 23% of the grafts had procurement-related injury, with 2.5% and 4% being discarded respectively. In pancreas procurement specific 28% of the grafts were injured, of which 24% was discarded.
Male donor gender and donor BMI>25 were found to be significant risk factors for procurement-related injury in kidney, liver and pancreas procurement. Moreover, aberrant vascularization of the kidney and liver during procurement emerged as a significant risk factor for procurement related injury. In multivariable cox regression analyses procurement related injury was not a significant predictor for (death-censored) graft failure (kidney; HR 0.99, 95% CI 0.75-1.33, p=0.99, liver; HR 0.92, 95% CI 0.66-1.28, p=0.61).
Conclusions: Donor BMI >25 and male donor gender were identified as significant risk factors for procurement-related injuries in kidney, liver, and pancreas procurement. In this 10-year follow-up study, no significant impact on graft failure after transplantation of kidney and liver grafts with procurement related injuries was found. These findings suggest that transplant surgeons exhibited good decision-making skills in determining the acceptability and repairability of procurement-related injuries. Only a small amount of all donated grafts were eventually discarded due to procurement-related injuries. However, it's noteworthy that 28% of pancreatic grafts had procurement injuries, highlighting an area for potential improvement in the procurement process.

Optimizing organ donation procedures in the Netherlands: A comprehensive analysis of time shifts and slot utilization post-implementation of the three independent procurement teams

J. Niesing[1], I.J.C. Dielwart[2], H.C.R. Verberght[3 / 4], A.C. Hemke[5], S.W.M. Olde Damink[3], M.C.G. van de Poll[6], J. de Jonge[7], R.A. Pol[8], [1]Surgery, University Medical Center Groningen, [2]Interne geneeskunde | chirurgie, UMC Groningen, [3]Surgery, Maastricht University Medical Center, Maastricht, [4]Surgery, NUTRIM, School for Nutrition and Translational Research in Metabolism, Maastricht, [5]Beleid, Nederlandse Transplantatie Stichting, Leiden, [6]Intensive Care, Maastricht University Medical Center, Maastricht, [7]Surgery, Erasmus MC, Rotterdam, [8]Chirurgie, UMC Groningen, Nederland.

Background: Since mid-2018, The Netherlands has implemented Independent Procurement Teams (IPTs) dedicated for the professional acquisition of organs from organ donors. These IPTs, comprising three experienced teams, operate round-the-clock to carry out donor procedures in donor hospitals. The deployment of three teams is a strategic measure aimed at ensuring the highest standards of performance. As part of this progressive initiative, it was mutually agreed that donation procedures would ideally be scheduled during two designated time slots: 10 AM and 2 PM. This scheduling is designed to optimize the fitness and effectiveness of the IPTs. This study investigates the efficacy of this commitment since the inception of the IPTs in 2018. Additionally, we explore any temporal variations and distinctions among teams over de course of their operational history.
Methods: For every donation procedure in which an IPT was deployed, we collected data on the scheduled start times of the procedure. This encompasses DCD procedures in which the donor did not die within the accepted time frame, as well as all procedures that, following initiation, did not culminate in actual donation or transplantation. In total, 1679 donation procedures were included for the span of 5.5 years.
Results: The 10-12 AM time slot is extensively used by all three IPTs, increasing from 22,9% in 2018 to 42,2% in 2022. Conversely, the 2-4 PM slot is not favored for donation procedure (from 6,2% in 2018 to 3,3% in 2022). There has been a considerable reduction in procedures during nighttime, from 21,0% in 2018 to 8,1% in 2022. Notably, there are small variations among the three IPTs, with the team responsible for the northern region of the Netherlands exhibiting the fewest procedures in the nighttime period (4,9% for IPT North in 2022 against 7,9% for IPT East and 12,0% for IPT West).
Conclusions: Since the implementation of IPTs in the Netherlands, there has been a noticeable shift in the start time of organ donation procedures, moving significantly, though not completely, towards standard office hours. This progressive adjustment represents a positive stride in enhancing the quality of donated organs, as the members of the IPT exhibit higher fitness levels during daytime hours. While recognizing the potential for improvement, particularly in team-specific variations, it is essential to consider the influence of differences between hospitals. The adoption of IPTs has demonstrated a positive impact on the overall organization of donation procedures in the Netherlands, contributing to the enhancement of quality in the process.

Association between timing of graft procurement with graft discard rates and post-transplant outcomes

M.J. Sonneveld[1], W.G. Polak[2], A.J.T. Jens[3], C. den Hoed [4], S. Darwish Murad[4], A.J. van der Meer[4], [1]MDL, Erasmus MC, Rotterdam, [2]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, [3]Eurotransplant, Eurotranplant, Leiden, [4]MDL, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: Use of deceased donors for liver transplantation dictates that many important steps from registration to graft procurement are performed outside of office hours. We studied the association between timing of (expected) graft procurement with graft acceptance rates and post-transplant outcomes.
Methods: We used data from the Eurotransplant registry and included all (planned) full-graft DBD liver transplants performed in the ET area from 2010-2021. We studied the association between planned day and time of graft procurement with graft discard rates, and the association between actual day and time of procurement with graft loss (defined as retransplantation or death of the recipient).
Results: A total of 22,518 grafts were registered during the study period, 5769 (25.6%) of which were discarded. Donors of discarded grafts were more often male (59% versus 53%, p<0.001), older (56 vs 55, p<0.001) and had a higher BMI (26 vs 25, p<0.001) and had higher ALT, GGT and bilirubin (all p<0.001). The proportion of discarded grafts was higher if the planned procurement was during the weekend (27% versus 25%, p=0.006), and if planned procurement was between 12:00-24:00 (26.5% versus 24.7% for procurement from 00:00-12:00, p=0.002). We observed an additive effect: the proportion of discarded grafts was 23.9% if procurement was planned on a weekday between 00:00 – 12:00, 26.3% if planned on a weekend day between 00:00-12:00 or on a weekday between 12:00-24:00, and 27.5% if planned during the weekend between 12:00-24:00 (p<0.001). Findings were consistent in multivariable logistic regression (aOR for graft discard for a planned weekend procurement: 1.141, p<0.001; aOR for a planned procurement between 12:00-24:00: 1.108, p=0.002).
A total of 16,661 eligible liver transplantations were performed in the study period.
Procurement on the weekend was not associated with 30-day grafts loss (p=0.919). Conversely, procurement between 18:00-06:00 (ie. outside of office hours) was associated with a significantly higher risk graft loss at 30 days (10.5% vs 9.0%, p=0.001). Findings were consistent in multivariable logistic regression (aOR for graft loss at 30 days: 1.142, p=0.015) and in multivariable Cox regression (adjusted HR: 1.06, p=0.022).
Conclusions: We observed significantly higher graft discard rates if procurement was planned during the weekend as well as during the afternoon and evening hours. Furthermore, graft procurement during evening and nighttime was associated with a significantly higher risk of graft loss. Therefore, interventions to safely delay graft procurement and transplantation to office hours could expand the donor pool and improve post-transplant outcomes.

Analysis of reported donors that not resulted in transplantation: the hidden prize of an increase in absolute numbers of organ transplantations.

K.A. Chotkan[1 / 2], M.A. Kuiper[3], J. Deggens[4], I.P.J. Alwayn[5], A.E. Braat[1], N.J. Jansen[4], [1]Heelkunde, Leids Universitair Medisch Centrum, Leiden, [2]Heelkunde, Nederlandse Transplantatie Stichting, Leiden, [3]Intensive Care, Medisch Centrum Leeuwarden, [4]Beleid, Nederlandse Transplantatie Stichting, Leiden, [5]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: In The Netherlands, the number of reported organ donors has increased over the last few years. This could be partly explained by expanding donor acceptance criteria. However, this may potentially lead to reporting donors with diminished organ quality, medical contra-indications and therefore a higher risk of cessation of the procedure. Currently, the ICU noticed to experience an increase in organ donation procedures that do not result in transplantation. This study aims to objectify such an increase and potential underlying mechanisms.
Methods: Retrospective analyses of all deceased donors in the Netherlands reported to Eurotransplant between 1 January 2018 – 31 August 2023. A utilized donor was defined as a reported donor that led to at least one organ transplantation. A non-utilized donor was defined as a donor that did not lead to at least one organ transplantation or of which the procedure was ceased during screening, allocation, procurement or were disapproved at the transplant center.
Results: In the studied period, 2087 donors were reported; 1514 donors were utilized and 573 non-utilized. An increase of 15% of reported donors (359 in 2018 vs. 414 in 2022) was observed. In absolute numbers this led to a linear increase in utilized donors (276 in 2018 vs. 289 in 2022), which is an increase of 5%. There was a linear increase in the percentage of non-utilized donors (23% in 2018 vs. 31% in 2023). The most frequent reasons for not utilizing a donor are; an agonal phase of over two hours in DCD donors (41%), an unacceptable medical history during screening (18%) and worsening of the organ function during the screening or allocation process (13%). Reasons for not transplanting at least one organ when a procurement procedure was started were finding a malignancy (0.6%, n=12) or poor organ quality (1.5%, n=32). The group of non-utilized donors had a significantly higher age, were more often DCD donors, were more often male and there was more hypertension and diabetes in this group.
Conclusions: Although the absolute number of organ procedures and transplantations has increased in the Netherlands in the period 2018-2023, the percentages of non-utilized donors has also increased. Non-utilized donors are significantly older, are more often DCD donors and have more comorbidities. The increase in absolute numbers of organ transplantations has a price. It leads to more effort in the intensive care and more non-utilized donors, which can have a negative effect on the motivation of ICU physicians. This hidden price needs to be discussed between ICU and transplantation physicians in order to maintain motivation of personal and utilize the donor potential to its fullest.

Excellent outcome of kidney grafts donated after euthanasia compared to standard donation after circulatory death kidneys.

J.S. Slagter[1], R.C. Minnee[1], J.A.M. Hagenaars[2], H.J.A.N. Kimenai[1], M.E.J. Reinders[3], J. van de Wetering[3], R.J. Porte[4], [1]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, [2]Organ Donation and Transplant Coordination, Erasmus MC Transplant Institute, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: For patients terminally suffering from neurodegenerative or psychiatric diseases, it is possible to donate their organs after euthanasia (ODE). The procedure is legally and ethically complicated, and only permitted in very few countries around the world. So far, the outcomes from ODE kidney grafts have not been investigated in a large population. To ascertain if ODE is a valuable option to expand the donor pool, it is important to determine the outcomes of these organs.
Methods: The database from the Dutch Transplantation Foundation was accessed from the start of the ODE program (September 2012) till June 2023. Both the short- and long-term outcomes from kidney grafts donated after standard donation after circulatory death (DCD) and ODE were compared.
Results: A total of 142 ODE kidneys were transplanted and compared to 2144 DCD kidney transplants. ODE was increasingly performed over the past years. Time from withdrawal of life support/administration of euthanasic drugs until cardiac arrest was significantly shorter in the ODE group compared to the DCD group (14.5 ± 5.7 versus 24 ± 19 min $p<0.001$). Delayed graft function (DGF) occurred significantly less in the ODE group compared to the DCD group (18.4% versus 49.7%, $p<0.001$). Serum creatinine in the ODE group was lower at 1-, 3-, and 5 years post-transplantation, although this did not reach statistical significance. There was no difference in graft and patient survival between ODE and DCD groups.
Conclusions: Kidney grafts donated after euthanasia yield favorable short-term outcomes and comparable long-term outcomes to DCD kidney grafts. ODE is a valuable way to both increase the kidney donor pool, as well as granting the final wish of these terminal ill patients.

Comparable outcomes for old, older and very old deceased donors in old kidney transplant recipients

S.E. de Boer[1], E. Tegzess[1], C. Moers[2], S.P. Berger[3], J.S.F. Sanders[4], [1]1. Dept. of Internal Medicine, Division of Nephrology, UMCG, Groningen, [2]Dept. of Surgery, UMCG, Groningen, [3]Interne geneeskunde, Nefrologie, UMC Groningen, [4]Nefrologie, UMC Groningen, Nederland.

Background: Old patients (≥ 65 years) make up almost 1/3 of the waiting list for kidney transplantation in the Netherlands, and this proportion continues to rise. These patients have a high waitlist mortality and benefit from early transplantation, even with kidneys from older or 'marginal' donors. Transplanting marginal donor kidneys may help to cut the proportion of elderly patients on the waiting list and improve clinical outcomes. More epidemiological support regarding the graft outcomes of old, older and very old donor kidneys is needed to support clinicians in accepting these kidneys. We therefore studied the outcomes of these kidneys in old recipients.
Methods: Retrospective cohort study of all kidney transplant recipients ≥ 65 years with a deceased donor ≥ 65 years in the Netherlands between 2005 and 2022. Discarded kidneys from deceased donors ≥ 65 years in the same time period were included as well. Donors were categorized into old (65-69 years, OD), older (70-74, OD+) and very old (75+, OD++).
Results: We included 1320 transplantations from donors ≥ 65 years, of which 447 from an OD+ and 94 from an OD++. Median recipient age was 69 years (66 - 72), 67% was male. The transplanted OD+ and OD++ kidneys were more often from DBD donors (OD 42%, OD+ 51.1%, OD++ 70.2%) with lower nadir creatinine ($P_{difference}$<0.01 for both).
Patient survival was similar for recipients of OD, OD+ and OD++ kidneys at one year (91% vs 89% vs 94%, respectively; $P_{log\text{-}rank}$=0.3) and at five years (64% vs 66% vs 73%; $P_{log\text{-}rank}$=0.2) after transplantation. Additionally, in multivariable Cox regression, donor age category was not associated with recipient mortality risk (Ref = OD: OD+: P=0.7; OD++: P=0.2).
Death-censored graft survival was ≥92% in all groups after 1 year, and did not differ between donor age categories ($P_{log\text{-}rank}$=0.4).
Kidneys offered but not accepted for transplantation (before procurement) had a higher serum nadir creatinine in comparison with transplanted kidneys (68 umol/L [56 - 84] vs 61 umol/L [51 - 78], p <0.001), and were more often from DCD donors (79% vs 53%, p<0.001). However, donor characteristics of many discarded kidneys resembled that of successfully transplanted kidneys.
Conclusions: Recipient and graft survival are good and similar for old patients receiving kidneys from old, older and very old deceased donors. These findings may contribute to a wider acceptance of kidneys from these donors.

Anonimiteit tussen ontvanger en donor: Juridisch kader en praktische handvaten om anonimiteit te bewaken

L. Raat[1], E. van Dieten[2], J.N. Nathan[3], [1]Juridische Zaken, Nederlandse Transplantatie Stichting, Leiden, [2]Donorvoorlichting, Communicatie en Onderwijs (DCO), Nederlandse Transplantatie Stichting, Leiden, [3]Raad van Bestuur, Nederlandse Transplantatie Stichting, Leiden, Nederland.

Achtergrond: Op nieuws websites en in kranten en tijdschriften is steeds meer aandacht voor succesvol uitgevoerde transplantaties. Daarnaast plaatsen transplantatiecentra, nabestaanden van donoren en ontvangers soms ook verhalen over donatie en transplantatie op hun online kanalen. De informatie uit deze artikelen al dan niet in combinatie met berichten op sociale mediakanalen, bedankbrieven en van de (O)DC'er ontvangen informatie vormen voor de ontvanger dan wel de donor of diens familie aanknopingspunten om elkaar te vinden. In sommige gevallen weten ontvanger en donor elkaar daadwerkelijk te vinden. Dat is niet de bedoeling omdat zij volgens de wet anoniem voor elkaar dienen te blijven. Hoe werkt onze organisatie aan het voorkomen van herleidbaarheid? En waarom vindt de wetgever dit belangrijk?
Doel: Op het Bootcongres zal het juridische kader uiteen worden gezet dat van toepassing is op het delen van informatie rondom een donatie en transplantatie. Aan de hand van concrete voorbeelden worden praktische adviezen gegeven over wat je wel kunt vertellen en wat niet om de anonimiteit tussen de ontvanger en de donor of diens nabestaanden te bewaken. Ook zullen de richtlijnen die wij als organisatie intern gebruiken voor het delen van verhalen en data op onze website over donatie en transplantatie gedeeld en toegelicht worden met de congresdeelnemers. Daarbij worden de toehoorders meegenomen in de dilemma's die we hierbij tegenkomen en de manier waarop we hier zo goed mogelijk mee proberen om te gaan.
Juridisch kader: In artikel 9.1 Eisenbesluit Lichaamsmateriaal 2006 is bepaald dat de identiteit van de ontvanger niet aan de donor of diens familie bekend wordt gemaakt, en andersom. Deze bepaling is in overeenstemming met het in Nederland heersende uitgangspunt dat uit privacy- en ethische overwegingen de ontvanger ontheven moet blijven van emotionele contacten of claims van de donor of diens familie.
Conclusie: Het onderwerp anonimiteit tussen ontvanger en donor, of diens familie, speelt overal en is daarom relevant voor elke schakel binnen het veld van donatie en transplantatie. Met het uiteenzetten van het juridisch kader en praktische handvaten wordt bijgedragen aan het bewaken van deze anonimiteit.

Designing a theory-driven prehabilitation program for kidney transplant candidates: insights from the PreCareTx-study.

C. Annema[1], A.J. Haanstra[2], Y. van der Veen[3], H. Maring[4], E.E. Quint[5], S.P. Berger[6], A.V. Ranchor[7], E.J. Finnema[2], [1]Gezondheidswetenschappen, sectie Verplegingswetenschap, UMC Groningen, Nederland, [2]Division of Nursing Science, Dept. of Health Sciences, [3]Dietetiek, UMC Groningen, [4]Revalidatie, UMC Groningen, [5]Chirurgie, UMC Groningen, [6]Interne geneeskunde, Nefrologie, UMC Groningen, [7]Gezondheidswetenschappen, sectie Gezondheidspsychologie, UMC Groningen, Nederland.

Background: Prehabilitation during the waiting list period could be an effective intervention to optimize the physical and psychological functioning of kidney transplant candidates (KTCs) to enable them to better withstand the stress of the transplant surgery and enhance recovery. Prehabilitation focuses on implementing lifestyle changes and, ideally, consists of physical training, dietary management, and stress reduction. So far, an evidence-based prehabilitation program has not been developed for KTCs. To engage individuals in behavioural change, it is essential that interventions are congruent with their own perspectives. Therefore, interventions should be designed in collaboration with KTCs and ensure flexibility to tailor the program to their needs and circumstances. The aim of this study was to systematically design a theory-driven prehabilitation program for KTCs.
Methods: The Behavioural Change Wheel-method was used to guide intervention development by employing the Capability-Opportunity-Motivation and Behaviour (COM-B) Model and the Theoretical Domains Framework. Scientific evidence, data from a preceding contextual analysis and feedback from various stakeholders, including KTCs and healthcare providers, were used to inform decisions on appropriate interventions.
Results: Target behaviours were defined as 'Increase activity behaviour', 'Adapt dietary habits', and 'Learning to deal with stressors'. To address each target behaviour, the COM-B dimensions Capability (e.g. lack of knowledge, lack of skills), Opportunity (e.g. lack of resources, lack of support), and Motivation (e.g. lack of motivation, negative thoughts) were used to determine the focus of the interventions. Thirty-eight behavioural change techniques (e.g. feedback on behaviour, information on health consequences, goal setting, social support) were selected within seven intervention functions: education, training, facilitating, modelling, persuasion, incentivization, and environmental restructuring. Based on the preferences of the KTCs, the intervention will be delivered as a home-based, person-tailored prehabilitation program with guidance from a healthcare professional.
Conclusions: Using a theory-driven and evidence-informed development process, we developed a set of possible interventions for each component of prehabilitation, that is congruent with the needs of KTCs, can be tailored to their personal circumstances and could be used to optimize the physical and psychological functioning of KTCs before the transplant.

Protocollair bekommeren

I.A. Faber[1], E. Verweij[2], R.A.M. Zekhuis[1], A.D. van Zuilen[2], [1]UMCU afd. Nefrologie, [2]Nefrologie, UMC Utrecht, Nederland.

Achtergrond: Niertransplantatie is een life-event. Bekend is dat veel niertransplantatiepatiënten distress ervaren. Het doel van onderzoek is om uit te zoeken welke methodische werkwijze passend is voor de psychosociale nazorg door het medisch maatschappelijk werk (mmw).
Methode: Het betreft verkennend kwalitatief onderzoek waarbij na literatuurstudie een focusgroep (6 getransplanteerde nierpatiënten) een semigestructureerd interview heeft ondergaan. Deelnemers zijn d.m.v. selecte steekproeftrekking geselecteerd. Er zijn ook 4 interne experts uit het eigen centrum geïnterviewd, geselecteerd d.m.v. de reputatiemethode. De interviewverslagen zijn ter controle voorgelegd aan één andere interne expert met dezelfde functie. En er zijn 3 externe mmw'ers semigestructureerd geïnterviewd. Ook de keuzemethodiek (kwantitatieve methode dataverzameling) is gebruikt om inzichten te verkrijgen in de voorkeuren m.b.t. nazorggesprek mmw.
Resultaten: Distress bij de niertransplantatiepatiënt komt veel voor. Dit herkennen patiënten en professionals. Het psychosociale proces na niertransplantatie en copingmethoden zijn verschillend. Uit het onderzoek komen verschillende inzichten naar voren: 1) Er moet zorg verleend worden vanuit professionele en specialistische kennis en ervaring. 2) Het bewust inzetten van methodische benaderingen passend bij de behoefte van de patiënt is belangrijk. 3) Inzicht in de brede context van de patient is nodig en focus op samenwerken is belangrijk. 4) Pas maanden na een niertransplantatie is er bij een patiënt meer ruimte en aandacht voor psychosociale ervaringen en de impact van de niertransplantatie. 5) Er wordt een drempel ervaren om een psychosociale hulpvraag te stellen. 6) Er is een duidelijke rol voor mmw in het nazorgtraject d.m.v. aanbodgestuurd (protocollair) werken. 7) Bieden van meer informatie over de rol van het mmw is nodig.
Conclusie: Om aan deze inzichten invulling te geven lijken de behoeften van de patiënt het beste ondersteund te worden door protocollair patiëntgericht contact door mmw, een aantal maanden na niertransplantatie, het zogenaamd Protocollair Bekommeren.

Verpleegkundige ondersteuning na niertransplantatie d.m.v. Leefstijlproject en Menukaart 'Kies voor beter'

A.H.M. Kooistra[1], E. Verweij[1], M.J.C. Wessels-Bakker[2], I.A. Faber[3], J.A. Netjes[4], F.M. Molenaar[1], F. Hartgens[5], A.D. van Zuilen[1], [1]Nefrologie, UMC Utrecht, [2]Divisie DIGD, afdeling Nefrologie HPno. F03.221, Universitair Medisch Centrum Utrecht, [3]UMCU afd. Nefrologie, [4]Revalidatie, Fysiotherapiewetenschap en Sport, UMC Utrecht, [5]Division Brain, Dept. of Rehabilitation, Physiotherapy Science and Sports, UMC Utrecht, Nederland.

Achtergrond: Op basis van een project vanuit de Nierstichting, de start van een landelijke werkgroep en later ook de aanZET studie besloten wij te investeren in de kwaliteit van leven van onze niertransplantatie patiënt, breder dan alleen de medische (orgaan) zorg.
Methode: Inventarisatie bij patiënten naar de behoefte van ondersteuning op verschillende levensgebieden. Aansluitend werd onderzocht welke ondersteuning al beschikbaar was, en welke ondersteuning wij zelf zo mogelijk nog konden gaan faciliteren.
Resultaten: Bij 32 patiënten 2-5 jaar na transplantatie werd een vragenlijst voorgelegd met 90% respons.
De volgende behoefte aan ondersteuning werd aangegeven:
Beweging / sport: 35%, Dieet: 35%, Medicatie: 27%, Gewicht (afvallen/aankomen): 19%, Dagbesteding / werk: 8%, Stoppen met roken: 4%, Seksualiteit: 4%, Financiën: 4%. Daarop werden de volgende thema's geïdentificeerd voor een menukaart van ondersteuning: Beweging / sport, stoppen met roken, gezond gewicht, veilige en gezonde voeding, psychosociale en praktische hulpverlening, zelfmanagementvaardigheidstrainingen, ondersteuning bij slaapproblemen. Voor de volgende thema's bleken regionale/ lokale mogelijkheden om patiënten aan te reiken: stoppen met roken, gezond gewicht, veilige en gezonde voeding, psychosociale en praktische hulpverlening. Een beweeginterventie werd middels sponsoring mogelijk gemaakt, en Walk & Talk voor onze regio werd opgericht. Vanaf begin 2021 werd er een beknopte menukaart van ondersteuning aangeboden, 60 % van de 215 getransplanteerde patiënten heeft op 6 weken na NTX of aansluitend één of meerdere van de items van deze beknopte kaart gekozen. Vanaf 1 september 2023 wordt een uitgebreid Kies voor beter menu aangeboden.
Conclusie: Sinds 1 september 2023 is er een uitgebreid keuzemenu gestart in ons centrum, doordat veel patiënten eerder al positief reageerden verwachten wij hiermee een belangrijke bijdrage te leveren aan kwaliteit van leven en welzijn van de niertransplantatiepatiënt.

Noninvasive monitoring of organ transplant rejection by immuno-PET imaging

R. J. F. Maas[1,2,3], J. Munitz[1,2], W. Wang[1,2], A. Ranzenigo[1,2], M. Umali[1,2], W. Tielemans[1,2], S. A. Nauta[1,2], J. Morla-Folch[1,2], T. Post[4], V. Peric[1,2], Z. A. Fayad[1,2], H. L. Ploegh[5], M. Rashidian[6,7], A. S. Farid[6,7], M. M. T. van Leent[1,2,8], W. J. M. Mulder[1,2,3,9], A. J. P. Teunissen[1,2,8,10].
[1]BioMedical Engineering and Imaging Institute, Icahn School of Medicine at Mount Sinai, New York, New York, USA. [2]Department of Diagnostic, Molecular, and Interventional Radiology, Icahn School of Medicine at Mount Sinai, New York, New York, USA. [3]Department of Internal Medicine and Radboud Institute for Molecular Life Sciences, Radboud University Medical Center, Nijmegen, the Netherlands. [4]Department of Nephrology and Radboud Institute for Molecular Life Sciences, Radboud University Medical Center, Nijmegen, The Netherlands. [5]Program in Cellular and Molecular Medicine, Boston Children's Hospital, Harvard Medical School, Boston, Massachusetts, USA. [6]Department of Cancer Immunology and Virology, Dana-Farber Cancer Institute, Boston, Massachusetts, USA. [7]Department of Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA. [8]Cardiovascular Research Institute, Icahn School of Medicine at Mount Sinai, New York, New York, USA. [9]Department of Chemical Biology, Eindhoven University of Technology, Eindhoven, the Netherlands. [10]Icahn Genomics Institute, Icahn School of Medicine at Mount Sinai, New York, New York, USA.

Background: Immune rejection following organ transplantation remains a major hurdle to transplant success, even with the administration of potent immunosuppressants. Therefore, monitoring immune activation in organ transplant recipients has great potential in optimizing treatment and transplant outcomes. Current methods for the detection of rejection are mainly based on highly invasive biopsies. Therefore, we developed noninvasive PET imaging-based methods for monitoring immune rejection and therapeutic effectiveness.
Methods: We used a well-established heart transplant mouse model in which syngeneic grafts (BL6 to BL6) are not rejected, and allogeneic grafts (Balb/c or DBA/2 to BL6) typically reject 7-9 days after transplantation. We also included allogeneic mice treated with mTOR-inhibiting nanobiologics (mTORi-NBs), which prolong graft survival.
We studied these animals using PET probes specific for glucose metabolism (^{18}F-FDG), myeloid cells (^{89}Zr-labeled CD11b-specific nanobodies), and cytotoxic T cells (^{89}Zr-labeled CD8-specific nanobodies). The recipients were subjected to PET-CT imaging on days 1, 3, or 6 post-transplantation. Tissues of interest were collected for gamma counting directly after imaging.
Results: We assessed ^{18}F-FDG uptake in the hematopoietic organs to examine inflammation. Our PET-CT data shows elevated ^{18}F-FDG uptake in the bone marrow and spleen of allogeneic transplant recipients on day 6, but not in the syngeneic transplant recipients. Interestingly, the enhanced ^{18}F-FDG uptake could be prevented by mTORi-NB therapy. ^{18}F-FDG uptake on days 1 and 3 was similar in all groups. Gamma counting results confirmed our findings.
To gain cell type-specific insights, we also employed ^{89}Zr-labeled nanobodies specific for CD11b or CD8, which we administered on day 6 after transplantation. PET-CT analyses showed that the uptake of these tracers was significantly higher in the grafts of allogeneic versus syngeneic transplant recipients, which was corroborated by gamma counting.
Conclusions: PET signal intensities of FDG, and nanobodies specific for CD11b or CD8 are indicative of graft rejection, showing that immuno-PET imaging is a promising technique to noninvasively monitor immune rejection. FDG PET can also detect therapeutic responses, demonstrating its potential to guide therapeutic interventions.

Non-HLA antigen-reactive CD4+ T cells against PECR and AT1R provide a novel and potential important pathway for induction of fibrosis in transplanted kidneys.

N.H.R. Litjens, F. Prevoo, M. Klepper, M.G.H. Betjes, Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, The Netherlands.

Background: Donor-specific antibodies may be directed to the mismatched HLA or non-HLA antigens expressed by the kidney allograft. Recently, we have described the level of non-HLA antibodies to be related to the degree of fibrosis within the kidney allograft. Within these areas of fibrosis, T cells have been identified. The origin and specificity of these T cells within the kidney allograft is unknown. The aim of this study is to determine whether non-HLA antigen-reactive T cells are present within the kidney allograft and associate with the degree of fibrosis.
Methods: Frequencies of non-HLA antigen-reactive T cells were measured using the CFSE-dilution flow cytometric assay as a readout of proliferation. The non-HLA antigens AT1R, PECR and ARHGDIB were selected, as antibodies directed to these non-HLA antigens were associated with the degree of fibrosis in a previous study. Kidney T cells were isolated and expanded from healthy native kidney tissue and donor kidney tissue explant cultures. After optimizing the proliferation assay, non-HLA antigen-reactive T-cell proliferation within PBMCs was compared to proliferation within the kidney T cells.
Results: The proliferative T cell response to the selected antigens was low, as expected for non-HLA antigens, and usually less than 5% of total T cells. With additional co-stimulation consisting of αCD28 and αCD49d (signal 2) and an optimal dose of exogenous IL-15 (signal 3), antigen-specific T cell proliferation was markedly enhanced with acceptable increases in non-specific T cell proliferation. CD4+ T cell proliferation (median and interquartile range) within PBMCs increased to 12.2 (8.6-26.7)%, 11.3 (8.6-20.6)% and 5.9 (3.8-22)% for PECR, AT1R and ARHGDIB, respectively. The non-HLA Ag-reactive T cells were predominantly CD4+ T cells (85%) and HLA-TCR dependency was confirmed as addition of a HLA-DR/DP/DQ blocking antibody decreased T-cell proliferation by >90%. The % proliferating AT1R- and PECR-reactive CD4+ T cells was on average 6-fold higher among kidney T cells compared to PBMCs, but only in kidney transplant tissue. Importantly, AT1R- and PECR-reactive T cell responses were associated with the degree of fibrosis in kidney biopsies ($Rs=0.64$, $P<0.05$). Analysis of AT1R-specific T cell lines showed high expression levels of the pro-fibrotic cytokines TGF-β, IL-6 and IL-17A, identifying these cells as potential mediators of fibrosis.
Conclusions: Non-HLA T cell reactivity to PECR and AT1R antigen is a novel and potential important pathway of kidney graft fibrosis.

Episomal DNA vector-induced EPO-overexpressing kidney organoids exhibit physiological effects after implantation

Z. Du[1], A. Bas-Cristóbal[1,2], M. Urban[3], A. Hartley[4], D. Ratsma[5], M. Koedam[6], T.P.P. van den Bosch[7], M.C. Clahsen-van Groningen[7], J. Gribnau[8], J. Mulder[9], M.E.J. Reinders[10], C.C.B. Baan[11], B. van der Eerden[6], R. Harbottle[3], M.J. Hoogduijn[12], [1]Erasmus MC Transplant Institute, Dept. of Internal Medicine, Erasmus University Medical Center, Rotterdam, [2]Erasmus MC Transplant Institute, Dept. of Internal Medicine, Sophia Children's Hospital, Erasmus University Medical Center, Rotterdam, Nederland, [3]DNA Vectors Lab, German Cancer Research Center (DKFZ), Heidelberg, [4]DNA Vectors Lab, German Cancer Research Center (DKFZ), Heidelberg, German Cancer Research Center (DKFZ), Heidelberg, Duitsland, [5]Laboratory for Calcium and Bone Metabolism, Dept. of Internal Medicine, Erasmus University Medical Center, Rotterdam, [6]Laboratory for Calcium and Bone Metabolism, Erasmus University Medical Center, Rotterdam, [7]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, [8]Dept. of Developmental Biology and iPS Core Facility, Erasmus University Medical Center, Rotterdam, [9]Dept. of Pediatrics, Sophia Children's Hospital, Erasmus University Medical Center, Rotterdam, [10]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [11]Internal Medicine, Erasmus Medical Center, Rotterdam, [12]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: The kidney plays an important endocrine role, including through the secretion of erythropoietin (EPO). EPO production is impaired in kidney disease patients, leading to anemia. Kidney organoids derived from human induced pluripotent stem cells (iPSC) are a potential tool for restoring EPO production. We generated stable EPO-overexpressing (EPO+) kidney organoids using DNA vectors and examined the physiological effects of EPO+ organoids.
Methods: A scaffold/matrix attachment region (S/MAR) DNA vector containing the EPO gene was designed and iPSCs were transfected. Subsequently, EPO+ organoids were differentiated and characterized by immunohistochemistry (IHC) using markers including PODXL for podocytes, Villin-1 for proximal tubular cells, E-cadherin for distal tubular cells and CD31 for endothelial cells.
Results: EPO+ kidney organoids produced constitutive high levels of EPO mRNA and protein throughout the differentiation. Quantification of IHC staining revealed that EPO+ organoids showed significantly increased areas of podocytes (44%, IQR 34-54 compared to 32%, IQR 28-39) and endothelial cells (5.0% IQR 3.5-7.2 compared to 1.8% IQR 1.5-2.5) while distal tubular cells were reduced (1.9%, IQR 1.5-3.0 compared to 6.1%, IQR 3.9-8.0). To study whether EPO+ organoids had physiological effects, EPO+ kidney organoids were implanted in immuno-deficient mice.
One month after implantation, EPO+ organoids continued to express high levels of EPO mRNA. The proportion of mouse capillaries in EPO+ organoids was 0.94% (IQR 0.35-2.3), which was significantly higher than the 0.22% (IQR 0.049-0.52) observed in WT organoids (p=0.0021, n=17). Hematocrit (HCT) levels were significantly increased in mice that received EPO+ organoids compared to WT organoids from 0.40 L/L (IQR 0.39-0.41) to 0.59 L/L (IQR 0.52-0.64), (p=0.0001, n=10). Moreover, the HCT levels showed a dose-dependent increase in mice that received EPO+ organoids. Furthermore, EPO+ organoids impacted trabecular bone tissue, leading to an increase in trabecular bone connectivity parameters. In the bone marrow, FGF23 mRNA levels were upregulated to 34 (IQR 21-85) by EPO+ organoids, compared to 17 (IQR 8.6-29) in control mice.
Conclusions: In conclusion, S/MAR DNA vectors can be used to generate stable transgene expression throughout kidney organoids differentiation. The effects of implanted EPO+ organoids on physiological parameters of the host showcase for the first time the potential of gene-edited kidney organoids for endocrine restorative therapy.

Subsets phenotyping and regulatory checkpoints analysis on circulating B cells in kidney transplant recipients

D.H.A. Altulea[1], T. Bijma[2], J.C. van den Born[3], P.H. Heeringa[4], L.C. Reteig[5], R.G.M. Lammerts[6], S.P. Berger[7], J.S.F. Sanders[8], [1]Division of Nephrology, Dept. of Internal Medicine, University Medical Center Groningen, [2]Dept. of Pathology and Medical Biology, University Medical Center Groningen, University Medical Center Groningen, [3]Nierziekten, University Medical Centre Groningen, [4]Dept. of Pathology and Medical Biology, University of Groningen, University, University Medical Center Groningen, [5]Center of Translational Immunology, University Medical Center Utrecht, [63] Transplantation Immunology, Dept. of Laboratory Medicine, University Medical Center Groningen, [7]Interne geneeskunde, Nefrologie, UMC Groningen, [8]Nefrologie, UMC Groningen, Nederland.

Background: While T-cells have long been the main focus of transplant research, B cells, traditionally viewed as immune effectors, are now recognized for their regulatory functions, particularly B regulatory cells (Bregs), associated with IL-10 expression. In kidney transplantation, Bregs have been associated with promoting graft survival and reducing rejection risk. However, a comprehensive understanding of B cell subpopulations and their immune regulators expression is lacking. We aimed to characterize B cell phenotypes and immune regulators expression in kidney transplant recipients to better understand their impact on transplant outcomes.
Methods: Cryopreserved peripheral blood mononuclear cells were obtained from 100 kidney transplant recipients transplanted between 1995 and 2005. Among these patients, 42 had pretransplant donor specific antibodies (DSA). The cells were thawed, then underwent surface marker staining after monocyte blocking. Markers included CD19, CD20, CD38, CD27, CD24, CD138, IgM, IgD, IgG, IgA, CD21, CD10, CD43, BTLA, PD1, FcyRIIb, CD22, FcRL5, CD40, ICOS, BAFFR, IL-21R, IL-6R, TACI, and more were used. Analysis was done with a Cytek Aurora flow cytometer and data analyzed using OMIQ web program. A healthy control reference scheme aided gate setting and spillover adjustment.
Results: We analyzed differences in B cells subsets and immune regulators expression in patients who were diagnosed with rejection and those without, as well as in patients with and without pretransplant DSA. Subset distribution revealed notable differences between patients who had rejection and those who did not. Memory B cells (p=0.03), naïve B cells (p=0.01), CD24hiCD27+ B cells (p=0.007), and B1 cells (p=0.01) exhibited distinct patterns. While most regulatory immune checkpoints showed no significant differences between the two groups, analyzing the patients' pretransplant DSA status unveiled variations in a few checkpoints. For instance, within the CD24hiCD38hi subset, IL-6R (p=0.01), TACI (p=0.03), and BTLA (p=0.02) demonstrated significant differences among patients with pretransplant DSAs, with or without rejection, and those without pretransplant DSAs, with or without rejection. Similar trends were observed in other B cell subsets, but in the general B cell group (CD19+CD20+/-), no significant differences were found for all checkpoints across all groups.
Conclusions: The results indicate differences in B cell subset distribution between kidney transplant recipients with and without rejection. Additionally, in sensitized patients with DSA before transplantation the immune regulators in the B cell subsets show potential differences in expression compared to patients without DSA.

Peptide sharing between CMV and mismatched HLA enhances T-cell-mediated rejection after kidney transplantation

E.T.M. Peereboom[1], J. Jairam[1], F.M. Verduyn Lunel[2], A.D. van Zuilen[3], E. Spierings[4], [1]Center for Translational Immunology, UMC Utrecht, [2]Medische Microbiologie, UMC Utrecht, [3]Nefrologie, UMC Utrecht, [4]Center for Translational Immunology, University Medical Center Utrecht, Nederland.

Background: Cytomegalovirus (CMV) is related to acute rejection and graft loss after kidney transplantation, but the underlying mechanism remains largely unknown. Certain CMV strains produce a peptide that is identical to the leader peptide of specific human leukocyte antigen (HLA) class I alleles: the VMAPRTLIL, VMAPRTLLL, or VMAPRTLVL peptide. Theoretically, CMV-seropositive patients who do not have the HLA class I leader peptide identical to the CMV peptide can develop an immune response against this peptide. When these patients are subsequently transplanted with a donor with the leader peptide, these CMV-specific immune cells might react against the donor kidney, which could lead to acute rejection.
Methods: We retrospectively investigated a cohort of 459 kidney transplantation that have been performed between 2006 and 2015 to assess whether CMV-seropositive patients without the HLA class I leader peptide, and who are transplanted with a donor with the leader peptide (i.e., transplantations with a HLA class I leader peptide mismatch), have an increased risk of T-cell mediated rejection (TCMR) in the first 90 days post-transplantation.
Results: The combination of CMV with the VMAPRTLIL leader peptide mismatch was associated with TCMR with a hazard ratio of 3.24 ($p < 0.0001$), and the VMAPRTLLL leader peptide mismatch with a hazard ratio of 2.08 ($p=0.02$, univariate Cox analyses). The VMAPRTLVL mismatch was not significantly associated with TCMR. After correction for other variables associated with transplantation outcome, the effect remained significant with a hazard ratio of 3.15 for VMAPRTLIL ($p<0.0001$) and 2.29 for VMAPRTLLL ($p=0.02$). Transplantations with either a VMAPRTLIL or a VMAPRTLLL leader peptide mismatch had a significantly higher cumulative TCMR incidence ($p < 0.0001$), with the main effect in the first two weeks after transplantation.
Conclusions: Together, our data suggest that CMV-positive patients without a leader peptide that is identical to a CMV peptide, and who are transplanted with a donor with this leader peptide, have a significantly increased risk of early TCMR. Preventing a leader peptide mismatch in these patients or adapting immunosuppression accordingly might decrease the incidence of early TCMR.

Site-directed mutagenesis of HLA-DQ molecules reveals the amino acids crucial for human monoclonal HLA-specific antibody binding

C.S.M. Kramer[1], U. Singh[2], S. Bezstarosti[1], N. Petrosyan[2], F. Quiroz[2], E.K.W. Hui[2], D. Suh[2], F.H.J. Claas[1], D. Lowe[2], T. Meng[2], S. Heidt[3], [1]Immunology, Leiden University Medical Center, Leiden, Nederland, [2]Research & Development, Transplant Diagnostics, Thermo Fisher Scientific, West Hills, Verenigde Staten, [3]Immunologie, LUMC, Leiden, Nederland.

Background: HLA matching in solid organ transplantation results in superior graft survival. However, not all HLA mismatches lead to donor-specific antibody (DSA) formation and inferior outcomes, which is referred to as differential immunogenicity. Human HLA-specific monoclonal antibodies (mAbs) are excellent tools to determine the key determinants, which may induce DSA. By studying the reaction patterns of mAbs against panels of HLA molecules and comparing the amino acid (AA) sequences of reactive versus non-reactive HLA antigens, the crucial AA involved in antibody binding can be deduced. However, occasionally the AA uniquely shared between reactive HLA molecules are too distant to be bound by a single antibody, rendering it impossible to define the AA involved in binding. To elucidate which residues are crucial for binding, we performed site-directed mutagenesis of HLA molecules to determine the AA crucial for binding by the HLA-specific mAbs. Since most DSA after transplantation are directed against HLA-DQ, we focused on site-directed mutagenesis of HLA-DQ molecules and tested the reactivity with several human HLA-DQ-specific mAbs.
Methods: Wild-type (WT) and 44 single, double, or multiple AA mutated HLA-DQ molecules were synthesized and cloned into an OLI expression vector. Subsequently, plasmids were introduced into cells derived from a human B cell line lacking endogenous HLA class II expression by electroporation. Expression of mutated HLA molecules was confirmed using a pan-HLA-DQ mouse mAb. The binding capacity of 12 HLA-DQ-specific mAbs to WT and mutant HLA-DQ molecules was assessed by flow cytometry.
Results: HLA-DQB1*02:01/DQA1*02:01, -DQB1*03:01/DQA1*03:03, -DQB1*04:01/DQA1*03:03, -DQB1*05:01/DQA1*01:02, and -DQB1*06:01/DQA1*02:01 were mutated with 13, 15, 3, 7, and 6 mutated versions per molecule respectively, without affecting expression. For four mAbs loss of binding was observed with four different single mutations of the appropriate HLA-DQ molecule, indicating that a single AA forms the crucial binding site for these antibodies to bind. For one single mutation loss of binding was observed for four different mAbs with same specificities. Contrastingly, for one mAb binding was abrogated only when two AA were mutated, indicating that both residues are required for binding. Interestingly, for one mAb reactivity to previously non-reactive HLA-DQ molecules was induced by specific mutations. This demonstrates that site-directed mutagenesis can lead to a gain-of-function and can confirm crucial binding sites.
Conclusions: Concluding, site-directed mutagenesis of HLA-DQ molecules is a feasible and effective approach to identify the crucial amino acids for binding of HLA-DQ-specific mAbs.

Targeting bcl6-mediated responses to inhibit allogeneic t follicular helper cell functions

R. Kraaijeveld[1], L. Steines[2], M. Dieterich[3], D.A. Hesselink[4], C.C.B. Baan[5], [1]Internal medicine - Division of Nephrology and Transplantation, Erasmus MC transplant institute, University Medical Center Rotterdam, Rotterdam, Nederland, [2]Dept. of Nephrology, University Hospital Regensburg, Regensburg, Bavaria, Duitsland, [3]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, Nederland.

Background: After organ transplantation, T follicular helper cells (Tfh) expressing the transcription factor BCL6 provide help to alloantigen-activated B cells and drive antibody-mediated rejection. BCL6 expression by germinal center B cells and Tfh cells plays a crucial role in germinal center development and persistence. Therefore, by targeting BCL6-expressing Tfh cells, there is a potential to suppress alloreactive responses. In this study, the inhibition of BCL6 by two small molecule inhibitors was tested *in vitro* to assess its effect on Tfh formation and activation in healthy controls and kidney transplant recipients.
Methods: Two experimental setups were used for this study. First, isolated naïve $CD4^+$ T cells from healthy volunteers (n=6) were polyclonally-activated in the presence or absence of the small molecule BCL6 inhibitor, 79-6 (25-250 µg/mL) and assessed for proliferation, BCL6 expression, and differentiation into Tfh cells based on CXCR5, ICOS and PD1 expression. Second, the inhibitory effect of BCL6 blockade on T cell activation and differentiation was investigated using PBMCs of kidney transplant recipients, after transplantation (n=16), in the presence or absence of another BCL6 inhibitor FX-1 (3-12.5 µg/ml), after alloantigen stimulation with donor cells.
Results: Naive T helper cells were polyclonally stimulated, which induced T cell proliferation and Tfh formation and activation. In the presence of the BCL6 inhibitor 79-6, proliferation was inhibited in a dose dependent manner, with >95% inhibition at a concentration of 250 µg/ml of 79-6. This also prevented their differentiation into activated Tfh cells. In addition, cell imaging flow cytometry confirmed that in these stimulated T cells, 79-6 suppressed the expression of BCL6 protein. The results with patient material are in line with these findings. After allo antigen stimulation, in the presence 12.5 µg/ml of the BCL6 inhibitor FX-1, proliferation was decreased by 60% and Tfh differentiation by more than 95%.
Conclusions: Our results show that the small molecule BCL6 inhibitors are able to suppress T cell proliferation and their differentiation into Tfh cells. These findings suggest a potential application for BCL6 inhibitors as a means to prevent allogeneic B cell responses.

Cellular responses of donor kidneys during normothermic machine perfusion can predict suboptimal post-transplant outcomes

H. Tejeda Mora[1], S. Li[1], D.M. Hullegie-Peelen[2], D. Schumacher[3/4], A. Babler[3/4], F. Schreibing[3/4], T.M. Anslinger[3/4], M.E.J. Reinders[5], R. Kramann[1/6/7], R.C. Minnee[8], M.J. Hoogduijn[2], [1]Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [2]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, Nederland, [3]Division of Nephrology and Clinical Immunology, RWTH Aachen University, Medical Faculty, Aachen, [4]Division of Nephrology and Clinical Immunology, Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, Aachen, Duitsland, [5]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, Nederland, [6]Internal Medicine, RWTH Aachen University, Medical Faculty, Aachen, [7]Internal Medicine, Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, Aachen, Duitsland, [8]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: Donation after circulatory death (DCD) and kidneys from older donors demonstrate increased susceptibility to ischemia reperfusion injury (IRI) and immune attack. Consequently, after transplantation, these kidneys face an increased likelihood of delayed graft function (DGF), an elevated risk of acute rejection and enhanced propensity for graft loss. Nevertheless, there are currently no assessment tools that can reliably predict post-transplant outcome. In this study we investigated whether the cellular responses of kidneys to normothermic machine perfusion (NMP) can predict post-transplant function and can stratify kidneys based on their quality.
Methods: Three kidneys with DGF and three patients without DGF were included for single nucleus RNA sequencing (snRNA-seq) of snap-frozen biopsies taken before and after 2-hour NMP. Clustering, differential gene expression and pathway enrichment were performed. Another 32 kidney biopsies from 16 patients were included for real-time PCR to further confirm the effect of NMP on kidney functionality. Creatinine levels until 30 days post-transplant were used to measure the post-transplant function of kidneys.
Results: snRNA-seq included a total 38451 cells distributed in 11 distinct cell types. Significant difference in overall gene expression due to NMP was observed in 9 out of the 11 identified cell types. This difference, present in all samples, was characterized by the upregulation of ATP production-related genes, transporter genes, heat shock protein (HSP) genes and genes that prevent protein misfolding after NMP. We observed no significant gene expression differences between the DGF and non DGF kidneys. However, we observed that after NMP, expression of HSP genes (DNAJA1, HSPA4L, HSPH1, HSP90AA1) were significantly increased in patients with both primary nonfunction (PNF)/rejection and abnormal creatinine levels. We confirmed this in the second cohort of 16 kidneys of which 2 out of 16 showed PNF and similar gene expression profile.
Conclusions: This unbiased genomics study demonstrates that 2-hour NMP impacts gene expression profiles of the majority of cell types of the kidney. Furthermore, it suggests that NMP may serve to predict suboptimal kidney functionality post-transplantation.

Normothermic machine perfusion and ischemic injury alter the metabolomic signature of porcine kidneys

B. Ogurlu[1], L.A. van Furth[1], T.L. Hamelink[2], V.A. Lantinga[3], Y. Zhou[1], H. Leuvenink[4], M. Pietzner[5], A.K. Keller[6], C. Moers[7], [1]Chirurgie, UMC Groningen, [2]Chirurgie - Orgaandonatie en Transplantatie, UMC Groningen, [3]Chirurgie, University Medical Center Groningen, [4]Chirurgie, UMC Groningen, Nederland, [5]Computational Medicine, Berlin Institute of Health at Charité – Universitätsmedizin Berlin, Berlin, Duitsland, [6]Urology, Aarhus University Hospital, Aarhus, Denemarken, [7]Dept. of Surgery, UMCG, Groningen, Nederland.

Background: Normothermic machine perfusion (NMP) has emerged as a promising method for the preservation, assessment, and repair of deceased donor kidneys prior to transplantation. However, *ex vivo* kidney physiology during NMP remains incompletely understood. To fully utilize the potential of NMP, it is pivotal to increase our understanding of active molecular mechanisms during perfusion. This study aimed to unravel the physiological differences between kidneys *in vivo* and *ex vivo* with minimal and severe ischemic injury during NMP by analyzing their metabolomic profile.
Methods: Pigs (n=30) underwent a bilateral nephrectomy to procure kidney pairs, which were randomized to sustain either minimal warm ischemia (WI) or 75 min of WI. After WI and 6 hours of cold preservation, both kidneys were simultaneously connected to two separate NMP circuits and perfused for 6 hours. Tissue samples were obtained at three different time points (*in vivo* before nephrectomy, pre-NMP, and end-NMP) to perform untargeted metabolomics measurements by Metabolon Inc.
Results: In total, 926 metabolites were identified. Compared to *in vivo* kidneys, 196 metabolites were significantly increased, and 391 metabolites were significantly decreased in *ex vivo* minimally injured kidneys (*P adj.* < 0.05). Enrichment analysis revealed that the Krebs cycle and multiple amino acid pathways were significantly decreased in *ex vivo* minimally injured kidneys compared to *in vivo* kidneys. Compared to *ex vivo* minimally injured kidneys, 108 metabolites were significantly increased, and 112 metabolites were significantly decreased in *ex vivo* severely injured kidneys (*P adj.* < 0.05). Interestingly, enrichment analysis showed that several amino acid pathways, the Krebs cycle, and the glycolysis/gluconeogenesis pathway were significantly increased in *ex vivo* severely injured kidneys compared to *ex vivo* minimally injured kidneys. Subsequent analyses showed that 47 of the 220 significantly altered metabolites had an area under the curve of the receiver operating characteristics (AUROC) of ≥ 0.9.
Conclusions:These findings suggest that the metabolomic signature between *in vivo* kidneys and *ex vivo* kidneys significantly differ. In addition, the metabolomic signature of *ex vivo* minimally injured kidneys significantly differs from the metabolomic signature of *ex vivo* severely injured kidneys. Moreover, 47 metabolites had a significant and adequate predictive value to identify injured kidneys during NMP.

Magnetic resonance imaging assessment of porcine and discarded human kidneys during ex vivo normothermic machine perfusion: PREPAIR-1 & PREPAIR-2 study

T.L. Hamelink[1], V.A. Lantinga[2], J. Castelein[3], B. Ogurlu[4], H. Leuvenink[5], R.J.H. Borra[3], C.L. Jaynes[1], A.K. Keller[6], C. Moers[7], [1]Chirurgie - Orgaandonatie en Transplantatie, UMC Groningen, [2]Chirurgie, University Medical Center Groningen, [3]Radiologie, UMC Groningen, [4]Chirurgie, UMC Groningen, [5]Chirurgie, UMC Groningen, Nederland, [6]Urology, Aarhus University Hospital, Aarhus, Denemarken, [7]Dept. of Surgery, UMCG, Groningen, Nederland.

Background: While renal normothermic machine perfusion (NMP) is on the rise, it remains unclear which NMP parameters convey information about graft viability. To fully utilize the diagnostic potential of renal NMP, it is pivotal to increase our knowledge about organ physiology during NMP. We combined non-invasive functional magnetic resonance imaging (MRI) with renal normothermic perfusion in a porcine (PREPAIR-1) and discarded human kidney (PREPAIR-2) model. This project aimed to assess *ex vivo* regional renal tissue oxygenation and diffusion patterns by means of T2* mapping and diffusion-weighted imaging (DWI), respectively.
Methods: In the PREPAIR-1 study, pigs (n=30) underwent a bilateral nephrectomy to retrieve kidney pairs, which were randomized to sustain either minimal warm ischemia (WI) or 75 min WI. After WI and 6 hours of oxygenated hypothermic machine perfusion ($HMPO_2$), both kidneys were simultaneously connected to two MRI-compatible NMP circuits and perfused for 6 hours. In the PREPAIR-2 study, discarded human kidneys (n=25) were retrieved and placed on $HMPO_2$ for 4 hours. Subsequently, human kidneys were placed on a similar MRI-compatible NMP circuit and perfused for 6 hours. In both studies, *ex vivo* MRI scans were repeatedly performed throughout NMP to provide longitudinal information about regional tissue oxygenation using T2* mapping and water diffusion patterns using DWI. Regions of interest were drawn in the cortex and medulla to calculate the mean signal intensity.
Results: Mean T2* corticomedullar (CM) signal ratio of the discarded human kidneys (0.97 ±0.23) differed significantly from the mean CM ratio of the minimal WI group (0.60 ±0.13, $P < 0.0001$) and the 75 min WI group (0.62 ±0.16, $P < 0.0001$). Cortical DWI signal of the minimal WI group (1.48 ±0.26 x 10-3 mm^2/s) was significantly lower compared to the 75 min WI group (1.76 ±0.14, $P < 0.0001$) and the discarded human kidney group (1.79 ±0.25, $P = 0.002$), while the 75 min WI group and human kidney group showed comparable values.
Conclusions: These findings provide novel insights in the differences in regional tissue oxygenation and diffusion characteristics between porcine and discarded human kidneys during *ex vivo* normothermic machine perfusion. In terms of cortical DWI, discarded human kidneys showed values comparable to those observed in ischemically damaged porcine kidneys, which could suggest that the utilization of non-injured kidneys may not accurately replicate the clinically compromised conditions as seen in human renal NMP.

Normothermic machine perfusion of discarded human donor kidneys: the first observations of the PREPAIR-2 study

V.A. Lantinga[1], T.L. Hamelink[2], B. Ogurlu[3], C.L. Jaynes[2], H. Leuvenink[4], C. Moers[5], [1]Chirurgie, University Medical Center Groningen, [2]Chirurgie - Orgaandonatie en Transplantatie, UMC Groningen, [3]Chirurgie, UMC Groningen, [4]Chirurgie, UMC Groningen, [5]Dept. of Surgery, UMCG, Groningen, Nederland.

Background: *Ex vivo* normothermic machine perfusion (NMP) is on the rise as a promising method for assessment and repair of donor kidneys. Although technically within reach, it remains unclear which parameters convey information about posttransplant function. To fully utilize the potential of NMP, improving our understanding of the ongoing physiological mechanisms is key. This study aimed to evaluate the different physiological processes of discarded human donor kidneys throughout NMP. Moreover, we evaluated the potency of two distinct vasodilators during NMP.
Methods: Twenty-nine human donor kidneys deemed unsuitable for transplantation for various reasons across the United States were included in this study. They were not selected on kidney donor risk index (KDPI), resulting in a highly variable set of donor kidneys. After arrival at our laboratory, kidneys were exposed to 4 hours of hypothermic machine perfusion, followed by 6 hours of NMP. During NMP, 17 kidneys received a continuous infusion of Flolan (4 ug/h), and 12 others received Verapamil (0.75 mg/h). Perfusion characteristics and kidney function were monitored throughout the 6 hours of NMP.
Results: Variability in functional markers and perfusion characteristics was evident among all donor kidneys during NMP. Median total urine production during NMP was 145 mL (IQR 17-482 mL). For the kidneys producing urine (76%), the median fractional sodium excretion (FENa) at 6 hours of NMP was 32% (IQR 14-58%). For donor kidneys with a KDPI>85%, there was no difference in urine production or FENa compared to donors with a KDPI≤85%. Additionally, the type of vasodilation led to notable differences in renal flow. While no significant differences were observed in the overall flow between the Flolan (176.6 [IQR 72.6-239.8] mL/min/100g) and Verapamil group (205.6 [IQR 143.2-256.0]; p=0.31), 4 kidneys in the Flolan group exhibited a remarkably poor perfusion, a phenomenon absent in the Verapamil group.
Conclusions: The response of each kidney on NMP was unique, underscoring the complexity of *ex vivo* kidney perfusion dynamics. Kidneys with a high KDPI did not show differences in function markers during NMP compared to kidneys with a lower KDPI. Notably, 4 kidneys in the Flolan group exhibited no vasodilative responses during NMP. These observations suggest that the epoprostenol mechanism of action might not work for all kidneys. Therefore, a calcium channel blocker like Verapamil could establish a more constant vasodilative effect across all donor kidneys.

Preserving mitochondrial function with sodium thiosulfate in donor heart preservation: a pre-clinical ovine model

I.A. Ertugrul[1], R. Puspitarani[2], V. van Suylen[1], M.A. Hu[3], B.D. Westenbrink[2], H. van Goor[4], M.E. Erasmus[5], [1]Cardiothoracale Chirurgie, UMC Groningen, [2]Cardiologie, UMC Groningen, [3]Afd. Cardiothoracale Chirurgie, UMC Groningen, [4]Medische microbiologie en Patholgie, UMC Groningen, [5]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen, Nederland.

Background: Mitochondria are crucial determinants for adequate cardiac function. Preserving mitochondrial function is therefore essential to assure viability of a donor heart. However during transplantation, mitochondria are damaged by ischemia-reperfusion injury. Identification of cardioprotective strategies to preserve mitochondrial function, may improve the number and quality of donor hearts. Sodium thiosulfate (STS) is shown to exert cardioprotective effects and might therefore protect the donor heart from ischemia-reperfusion injury. The aim of this study is to evaluate if STS treatment during donor heart preservation will preserve mitochondrial function.
Methods: Ovine hearts retrieved from the slaughterhouse were randomly assigned to 1) control: cardioplegia (4°C) and oxygenated subnormothermic machine perfusion (SMP, 15°C), 2) STS 4: STS treatment (10mM) during both cardioplegia (4°C) and SMP, 3) STS 20: STS treatment (10mM) during both cardioplegia (20°C) and SMP. After SMP, all hearts were functionally evaluated during normothermic machine perfusion with pressure-volume loop analyses. Mitochondrial function was evaluated with high-resolution mitochondrial respirometry.
Results: After preservation, oxidative phosphorylation (OXPHOS) capacity was similar in all groups (control: 193.2 ± 61.2, STS 4: 197.3 ± 23.3, STS 20: 239.1 ± 94.1, p=0.5). After reperfusion, ovine hearts treated with STS showed significantly higher OXPHOS capacity compared to control hearts (control: 124 ± 28.4, STS 4: 249.3 ± 86.6, p=0.002, STS 20: 239.4 ± 48.9, p=0.002). Respiratory control ratio at reperfusion was significantly higher in the STS 4 group compared to control (control: 3.8 ± 2.0, STS 4: 6.9 ± 1.7, p=0.01). No differences were observed between the STS 4 and STS 20 group. Left ventricular elastance was higher in STS treated groups compared to control (4.1 ± 1.3 vs 2.2 ± 1.1, p=0.07).
Conclusions: Slaughterhouse ovine hearts can be successfully applied in ex situ machine perfusion studies, recapitulating the transplantation setting. Post-conditioning the heart with STS results in preservation of mitochondrial respiratory capacity post-reperfusion. Further cardioprotective effects of STS on the donor heart should be explored.

Long-term ex situ normothermic machine perfusion of human donor livers results in perfusion fluid containing physiological levels of active hemostatic proteins

B. Lascaris[1], S.B. Bodewes[2], J. Adelmeijer[3], M.W.N. Nijsten[4], R.J. Porte[5], V.E. de Meijer[2], J.A. Lisman[3], [1]Surgery, Section of Hepatobiliary Surgery and Liver Transplantation, University Medical Center Groningen, [2]Dept. of Surgery, University Medical Center Groningen, [3]Surgical Research Laboratory, University Medical Center Groningen, [4]Critical Care, University Medical Center Groningen, [5]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: Normothermic machine perfusion (NMP) is an increasingly used method for preservation and assessment of human donor livers prior to transplantation. During NMP, the liver is metabolically active, which allows to study the physiology of an isolated perfused liver, including the production of hemostatic proteins. We aimed to investigate the production and activity of hemostatic proteins during long-term NMP of human livers up to 7 days.
Methods: Six discarded human donor livers underwent NMP with a perfusate based on red blood cells, albumin, colloids, and parenteral nutrition using a modified Liver Assist device (XVIVO, Groningen, Netherlands) for up to 7 days. Heparin was added to the perfusion fluid continuously. Perfusate samples were collected before the start of perfusion and daily thereafter. After *in vitro* heparin neutralization, international normalized ratios (INR) were analyzed. In addition, we measured antigen and activity levels of factor II and V, antithrombin, and fibrinogen, as well as levels of protein induced by vitamin K absence (PIVKA-II).
Results: Perfusate INR values declined over time, which was accompanied by detection of substantial quantities of all analyzed coagulation proteins. Antigen and activity levels of factor V and antithrombin increased to a similar extent resulting in a specific activity comparable to pooled normal plasma (PNP). The specific activity of factor II and fibrinogen was substantially decreased compared to PNP. The lower specific activity of factor II was accompanied by elevated levels of PIVKA-II.
Conclusions: During long-term NMP of human donor livers, hemostatic proteins are produced in substantial quantities, resulting in stable and (near) physiological perfusate protein levels after a few days of perfusion. This may indicate establishment of an equilibrium between the production and clearance of these proteins. Whether these high levels of hemostatic proteins result in coagulation problems during perfusion, requiring adjustment of our anticoagulation approach needs further study. NMP of human livers may be used as a platform to test efficacy of drugs that stimulate or inhibit the production of coagulation factors, or to test liver-mediated clearance of prohemostatic protein therapeutics.

The effect of donor and donation parameters and viability assessment criteria during normothermic machine perfusion of the liver on the decision to transplant: a meta-analysis

A.M.P. den Dekker[1], A. Franssen[1], J.B. Doppenberg[1], I.P.J. Alwayn[2], [1]LUMC transplant center, Leiden University Medical center, Leiden, [2]Heelkunde, divisie transplantatie , Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: Normothermic machine perfusion (NMP) is typically used for viability assessment of a donor organ. However, there is little understanding of the influence of donor and donation factors on a donor liver's ability to reach viability assessment criteria during NMP. Furthermore, a wide variety of viability assessment criteria are employed in clinical practice to gauge the suitability of a liver for transplantation. The aim of this meta-analysis was to investigate the effect of donor and donation parameters and viability assessment criteria on the decision to transplant a liver subjected to NMP.
Methods: A comprehensive search was performed in PubMed, Web of Science, EMBASE, and the Cochrane Library for publications reporting livers placed on NMP, during which metabolic and perfusion parameters are used for viability assessment prior to transplantation. Out of 625 unique articles, 11 were included in this meta-analysis. Effect size (ES) was calculated using Cohen's d and log odds ratio. When I^2 was 0.5 or lower, a fixed effects model was used, otherwise, a random effects model was used to account for heterogeneity.
Results: A total of 374 livers were subjected to NMP and following viability assessment 283 were transplanted and 91 were rejected. Livers from donors after brain death (DBD) were transplanted significantly more frequently than livers from donors after circulatory death (DCD) ((ES): 0.657, I^2=0.41, p=0.011). Furthermore, livers with shorter cold ischemia time (CIT) (ES: -0.301, I^2=0.08 p=0.015) and lower liver weight (ES: -0.535, I^2=0.14, p<0.001) were transplanted more often. Donor age (ES:-0.138, I^2=0.00, p=0.262), BMI (ES:0.103, I^2=0.89, p=0.891) and warm ischemia time (WIT) (ES:0.08 , I^2=0.00, p=0.640) did not differentiate between livers accepted for transplantation and those rejected after viability assessment during NMP. Binary viability assessment criteria which portray significant differences between transplanted and rejected livers include lactate clearance, glucose metabolism, ALT, perfusate/bile pH and bile production.
Conclusions: After viability assessment during NMP, livers from DBD donors, with shorter CIT and lower weight were transplanted more often. Donor age, BMI and WIT did not differ significantly between the transplanted and rejected groups. This study suggests that perceived donor characteristics may play a lesser or more important role in decision to transplant in the context of viability assessment during NMP.

Activated donor-derived platelets are released from human donor livers during normothermic machine perfusion

S.B. Bodewes[1], B. Lascaris[2], B.P. van den Boom[3], R.J. Porte[4], V.E. de Meijer[1], J.A. Lisman[5], [1]Dept. of Surgery, University Medical Center Groningen, [2]Surgery, Section of Hepatobiliary Surgery and Liver Transplantation, University Medical Center Groningen, [3]Surgery, University Medical Center Groningen, [4]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, [5]Surgical Research Laboratory, University Medical Center Groningen, Nederland.

Background: Ex situ normothermic machine perfusion (NMP) can be used for viability assessment of high-risk donor livers by enabling full metabolic activity. Livers are accepted or declined based on predefined criteria after 2.5 hours of NMP. Previous research revealed release of platelets during NMP. The question remains, whether these platelets are activated or not. In this study, we studied the platelet count (PC) dynamics in the perfusate, their functionality, and their origin.
Methods: Perfusate samples were collected at three time points during NMP: at the start, after 2.5 hours, and after 5 hours of perfusion. The PC and immature platelet fraction (IPF) were determined by the routine diagnostic methods. We performed flow cytometry analysis using markers for platelet activation (P-selectin and PAC-1) in perfusate samples prior to and after activation by thrombin receptor activating peptide (TRAP) and methylthioadenosine diphosphate (MesADP), which was compared to control human plasma samples.
Results: A total of 30 donor livers were included. We observed an increase in PC in the perfusate from 1.3x10^9/L (1.30x10^9/L -1.31x10^9/L) at the start of perfusion to 14.0x10^9/L (13.04x10^9/L - 14.97x10^9/L) after 2.5 hours of perfusion, and 10.0x10^9/L (9.32x10^9/L -11.44x10^9/L) after 5 hours of perfusion. No significant differences in PC over time were observed between livers accepted or declined livers (after 2.5 hours, 13x10^9/L vs 13x10^9/L, p=0.577, respectively). The IPF in all samples was within the normal range, with a median of 5.9% after 2.5 hours of NMP. Flow cytometry analysis at the start of NMP revealed a six-fold increase in platelet activation in the perfusate compared to controls, which could be further activated by TRAP or mes-ADP. Platelet activation capacity decreased throughout NMP.
Conclusions: The normal IPF range and decreasing PC during NMP strongly suggest that these platelets originate from the donor, released during NMP rather than produced. These donor-derived platelets maintain activation capability or are already activated. Considering the potential harm from activated platelets, incorporating anti-platelet agents into the NMP perfusate could enhance donor liver preservation. Conversely, platelets also promote regeneration. Understanding donor-derived platelet dynamics during NMP guides future strategies for optimizing liver preservation.

The ability of an electronic nose to distinguish between infections in lung transplant recipients

N. Wijbenga[1,2], C.E. Luijendijk[1,2], R. van Pel[1,2], B.J. Mathot[1,2], L. Seghers[1,2], D. Bos[3], O.C. Manintveld[4], M.E. Hellemons[1,2], [1]Dept. of Respiratory Medicine, Erasmus University Medical Center, Rotterdam, [2]Dept. of Respiratory Medicine, Erasmus MC Transplant Institute, Rotterdam, [3]Radiology & Nuclear Medicine / Epidemiology, Erasmus MC, University Medical Center, Rotterdam, [4]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam, Nederland.

Background: Early post-transplant, airway infections are common, with reported incidences between 22-36% in the first year. Infections significantly contribute to the development of chronic lung allograft dysfunction, impacting long-term survival and quality of life. Common issues include over- and under-treatment, along with delays in diagnosis of infections. Early infection type (viral, bacterial, or fungal) diagnosis and correct treatment could further improve outcomes. As potential alternative and faster point-of-care test (POCT) to distinguish between different types of airway infections, we assessed the ability of exhaled breath analysis using an electronic nose (eNose) to distinguish between infection types.
Methods: Lung transplant recipients (LTR) with either a FEV1 decline OR increased airway obstruction, OR new respiratory symptoms OR acute respiratory insufficiency, AND subsequently proven single (bacterial, viral, or fungal) infection were included. Exhaled breath analysis was performed using an eNose (SpiroNose). Partial least squares discriminant analysis and one-vs-all receiver operating characteristics (OvA AUROC) were used to assess discrimination between infection types.
Results: In total, 30 LTR were included; 23% female, median age 60 (18 – 73) years, time after LTx 1.8 (0.3 – 14.7) years. Of these LTR, 10 were diagnosed with bacterial, 15 with viral and 5 with fungal infections. The SpiroNose could accurately discriminate between different kind of infections with an overall accuracy of 80%. Additionally, OvA AUROC results showed accurate discrimination between the infection types with an AUC of 0.97 (CI 0.91 - 1.00) for bacterial, an AUC of 0.92 (CI 0.84 - 1.00) for viral, and an AUC of 0.87 (CI 0.74 - 1.00) for fungal infections.
Conclusions: Exhaled breath analysis using an eNose has potential as a non-invasive POCT for fast discrimination between infection types in LTR. Hence, eNose technology may serve as a valuable POCT to identify the type of infection in LTR, with immediate differentiation between viral and bacterial infections potentially having most direct clinical consequences, guiding treatment decisions.

Evaluation of long-lasting lung inflammation in circulatory death rat donors using tissue culture and normothermic regional perfusion

M.M.A.R. Munhoz Assis Ramos[1,2], L.F.A. Ferreira Anunciação[1], F.Y.R.S. Yamamoto Ricardo da Silva[1], C.J.C. De Jesus Correia[1], F.L.P.M. Pinho Moreira[1], A.C.B.F. Breithaupt-Faloppa[1], [1]Cardiopneumologia, Universidade de São Paulo, São Paulo, Brazilië, [2]Cardiopneumologia, UMC Groningen, Nederland.

Background: Lung transplantation after circulatory death (DCD) is an option to treat end-stage diseases. Lungs are highly affected organs and present a long transplantation waiting list, moreover, they have a considerable chance of developing primary graft dysfunction(PGD). In order to expand the donor pool, normothermic regional (*in-situ*) perfusion is an alternative to *ex-vivo* lung perfusion. Lung tissue culture can be a tool to evaluate the long-lasting release of inflammatory mediators. This aimed to study the late inflammatory profile of DCD donor lungs, after warm ischemia, using normothermic regional perfusion and tissue culture.
Methods: Male Wistar rats were submitted to circulatory death (19.1% KCl solution, i.v.) followed by 30 minutes of ventilated warm ischemia. Afterwards, the lungs were placed in cold storage (CS; at 4°C for 2 hours); or perfused *in situ* for 2h with Perfadex® in an open circuit (P; at 37°C via the pulmonary artery). The perfusate was collected at 15 and 120 minutes of perfusion period. Lungs were harvested for cellular infiltrate on histopathological analysis. Lung fragments were placed in culture (24 hours - explant), and medium was used to measure IL-6, TNF-α and IL-10 concentration.
Results: CS lungs homogenates presented lower concentration of TNF-α than P lungs (CS:10.75±3.41; P:58.65±20.48 pg/mg; p=0.0576). There were no differences in IL-10 and IL-6. In the perfusate, the inflammatory mediators concentration increased with time in both groups. Conversely, in the lung tissue culture (24 hours later), IL-6 (CS: 15.99±1.20; P: 7.52±1.86 pg/ml/mg; p= 0.0032) and IL-10 (CS: 35.35±8.33; P:20.22±6.46 pg/ml/mg; p= 0.4772) were higher in CS indicating a time and preservation dependent inflammatory response. Nonetheless, TNF- α was not altered in the explant quantification, but it is important to consider that it is an early mediator.
Conclusions: Comparing the immediate tissue analysis and the 24h tissue response, the normothermic regional perfusion of the lungs seems to reduce the inflammatory cytokines production and that could indicate a worse scenario in the recipient of cold-stored organs.

Optimising leukocyte filtration during clinical ex vivo lung perfusion: A novel approach

M.A. Hu[1], Z.L. Zhang[2], R.F.H. Roland[3], C. van de Wauwer[4], E.A.M. Verschuuren[5], H. Leuvenink[6], M.E. Erasmus[7], [1]Afd. Cardiothoracale Chirurgie, UMC Groningen, [2]Cardiothoracale Chirurgie, [3]Thorax, UMC Groningen, [4]Cardiothoracale Chirurgie, [5]Longziekten, UMCG, Groningen, [6]Chirurgie, UMC Groningen, [7]Cardiothoracale chirurgie/Transplantatie instituut, UMC Groningen, Nederland.

Background: During Ex Vivo Lung Perfusion (EVLP), it is standard practice to incorporate a leukocyte filter to minimize inflammation by passenger leukocytes and primary graft dysfunction. The most widely used inline filter is the Pall Leukoguard LG6. As we found high leukocyte levels during EVLP we hypothesize that the Pall LG6 filter becomes ineffective at reducing leukocytes during EVLP. We investigated how we could lower the circulating leukocytes by using Fresenius BioR 02 plus leukocyte filters in a parallel fashion for additional leukocyte filtration during EVLP and investigated why the Pall LG6 failed to reduce leukocytes.
Methods: EVLP was performed for minimal 180 min with 1 unallocated unilateral and 9 bilateral human donor lungs. Perfusate samples were taken every 10 min from the in- and outlet of the Pall LG6 filter, which was subsequently clamped after 60 min. Additional parallel leukocyte filtration by using four Fresenius filters was done in 5 bilateral EVLPs. Leukocytes were adjusted for STEEN solution refreshment.
Results: Eight bilateral donor lungs were transplanted. Leukocytes increased significantly during EVLP in the standard group, despite the presence of the Pall LG6. This is in contrast to the additional Fresenius leukocyte filtration group which showed significant lower increases in leukocytes at 180 min ($p = 0.008$). Minor reductions by Pall LG6 were only seen at 30 min ($p = 0.031$) and 50 min ($p = 0.011$) compared to 10 min. Our parallel filtration system showed effective leukocyte removal up to 5 hours with a removal rate of 88% and 95% at 180 and 300 min.
Conclusions: Pall LG6 filters are unable to significantly filter circulating leukocytes during EVLP since their absolute reduction in leukocytes is negligible. Therefore, other approaches are necessary. We showed that parallel filtration using Fresenius BioR 02 filters can remove up to 95% of the leukocytes and proves to be more effective than Pall LG6 filters. Nonetheless, increased sample size and further research are required to determine the impact on clinical outcomes.

Vascular complications in lung transplantation with and without use of extra corporeal membrane oxygenation

L.E. Boersma[1], D. Ruigrok[2], N.P. van der Kaaij[3], J.A.J.M. Hermens[4], N. Kusadasi[4], E.E.C. de Waal[1], [1]Dept. of Anaesthesiology, University Medical Center, Utrecht, [2]Longziekten, UMC Utrecht, [3]Cardiothoracale chirurgie, UMC Utrecht, [4]Dept. of Intensive Care Medicine, University Medical Center, Utrecht, Nederland.

Background: Outcomes in lung transplantation (LTx) have improved considerably over the years, due to advancements in techniques. This includes e.g. the more frequent use of extracorporeal membrane oxygenation (ECMO) before, during and/or after the procedure. However, ECMO may negatively influence postoperative outcome due to complications, such as bleeding and thrombosis. Insight in the current incidence of these vascular complications after LTx and the effect of ECMO treatment is scarce. The aim of this study is to assess the incidence of vascular complications following LTx and to assess the influence of ECMO.
Methods: In this retrospective single-center cohort study, 100 consecutive adults undergoing LTx between November 2018 and March 2022 were evaluated for vascular complications in the first postoperative 30 days. Vascular complications were categorized in 1. hemorrhagic events (including hemothorax, access site bleeding, intracranial bleeding and other hemorrhagic events), and 2. thrombotic events (including venous thromboembolism, cannula related thrombosis, intracranial infarction and other peripheral arterial embolisms). Incidences were compared between both groups stratified by the use of ECMO.
Results: In 100 LTx patients, the overall incidence of vascular complications was 46%. In total, 69 out of these 100 patients received ECMO support before, during and/or after the procedure. Stratified incidence of vascular complications was higher in the ECMO supported group (54% vs 29%, p=0.011). Hemorrhagic events occurred in 28% out of the 100 patients and significantly more often in the ECMO supported group (39% vs 3%, p<0.001). Thrombotic events occurred in 26% out of the 100 patients and did not significantly differ between both groups (26% vs 26%, p=0.976). The ECMO group had a longer length-of-stay (LOS) in the Intensive Care Unit (ICU) (16[IQR 9-39] vs 5[4-8] days, p<0.001) and a longer hospital LOS (41[28-56] vs 28[24-36] days, p<0.001). One year survival did not differ between both groups (88% vs 90%, p=0.777).
Conclusions: Vascular complications occurred in 46% of all LTx patients in our cohort. Although incidences of thrombotic complications did not significantly vary between patients with or without ECMO support, the occurrence of hemorrhagic complications was significantly higher in the ECMO supported group. This was probably related to a longer ICU LOS and hospital LOS in the ECLS group, without increased mortality.

High incidence of in-hospital venous thromboembolism after lung transplantation

J. Admiraal[1], L.E. Boersma[2], R. Schonwetter[3], N.P. van der Kaaij[4], N. Kusadasi[5], M.C. Post[6,7], H.D. Luijk[1], D. Ruigrok[1], [1]Longziekten, UMC Utrecht, [2]Dept. of Anaesthesiology, University Medical Center, Utrecht, [3]Longziekten, St. Antonius Ziekenhuis, Nieuwegein, [4]Cardiothoracale chirurgie, UMC Utrecht, [5]Dept. of Intensive Care Medicine, University Medical Center, Utrecht, [6]Cardiologie, St. Antonius Ziekenhuis, Nieuwegein, [7]Cardiologie, UMC Utrecht, Nederland.

Background: Lung transplantation (LTx) is an established treatment for eligible patients with end-stage lung failure. Survival after LTx is limited, mainly because of chronic lung allograft dysfunction. Other complications such as infections and malignancy also have a major impact on morbidity and mortality after LTx. Venous thromboembolism (VTE) after LTx might have the same impact but is less well studied. The aim of this study was to investigate the incidence and characteristics of early VTE after LTx and the impact on short- and long-term survival.
Methods: A retrospective single-center analysis of 253 consecutive LTx recipients transplanted between June 2013 and June 2022 was performed. Primary outcome was the incidence of VTE after LTx diagnosed during the index hospitalization after LTx. VTEs were characterized according to type (deep vein thrombosis (DVT) or pulmonary embolism (PE)). Impact on short- and long-term survival was analyzed, and univariate analysis was performed on associated/risk factors.
Results: During the index hospitalization, 45 (18%) LTx recipients were diagnosed with VTE: 26 (58%) were PE, 13 (29%) were upper extremity DVT, and 6 (13%) were lower extremity DVT. LTx recipients with VTE had a longer duration of ICU stay (16 (IQR 6-39) vs 7 (4-13) days, p 0.001) and length of hospital stay (LOS) (41 (26-75) vs 28 (22-43) days, p 0.001) compared to the non-VTE group. In the VTE group 91.1% survived to discharge, which was the same in the non-VTE group with 91.3%; median survival was not different between groups. Univariate analysis identified retransplant (OR 6.67, 95% CI 1.44-30.9, p 0.015), duration of ICU stay (OR 1.02, 95% CI 1.01-1.03, p 0.005) and LOS (OR 1.02, 95% CI 1.01-1.03, p 0.001) as factors associated with the presence of VTE during the index hospitalization. Use of extracorporeal membrane oxygenation (ECMO) pre-, per- and/or post-operative was not different across groups. Also dose of thromboprophylaxis (dalteparin 2500 versus 5000 IE) was not associated with VTE.
Conclusions: VTE was diagnosed in 18% of LTx recipients during the index hospitalization, despite thromboprophylaxis; the majority of VTE were acute PE. The presence of VTE was associated with a significantly longer LOS and ICU stay, while in-hospital mortality and median survival were not different. Retransplant was associated with a higher VTE incidence. In this cohort, use of ECMO and dose of thromboprophylaxis were not associated with a higher incidence of VTE during the index hospitalization.

De prevalentie van non-responders na hepatitis B vaccinatie onder patiënten die op de wachtlijst staan voor longtransplantatie

I. van Ewijk-Hagenaar[1], L. de Boer[1], H.D. Luijk[2], E.M. Berg[1], A.H.W. Bruns [3], D. Ruigrok[2], [1]Longtransplantatie, UMC Utrecht, [2]Longziekten, UMC Utrecht, [3]Infectieziekten, UMC Utrecht, Nederland.

Achtergrond: Transmissie van het hepatitis B virus (HBV) kan plaatsvinden tijdens longtransplantatie. Daarom is het belangrijk dat patiënten die in aanmerking komen voor een longtransplantatie worden gevaccineerd tegen HBV. Niet alle patiënten maken voldoende antistoffen aan na de vaccinatieserie (non-responder). Uit de literatuur blijkt dat de prevalentie van non-responders na een HBV vaccinatie varieert tussen de 27 en 57%. Gezien de onvoorspelbaarheid van de longtransplantatie lukt het niet altijd om de vaccinatieserie af te ronden. Bij progressieve ziektebeelden wordt daarom gebruik gemaakt van een versnelde serie. Deze studie onderzoekt de prevalentie en eventuele oorzakelijke factoren voor non-respons (anti-HBs titer <10 IE/L) bij patiënten die op de wachtlijst staan voor een longtransplantatie.
Methode: Er werd een retrospectief onderzoek uitgevoerd in het UMC Utrecht. Alle patiënten die een longtransplantatie ondergingen tussen januari 2017 en januari 2023 en pre- en postoperatieve zorg in het UMCU ontvingen, werden geïncludeerd. Van deze patiënten werd het volgende vastgelegd: het vaccinatieschema, of het vaccinatieschema wel of niet voltooid was, en de anti-HBs titer na vaccinatie indien beschikbaar.
Resultaten: Van de 50 patiënten die werden onderzocht voltooiden 27 patiënten (54%) de vaccinatieserie. Daarvan bleken 16 patiënten (59%) non-responder te zijn. De serie werd niet afgemaakt door 18 patiënten (36%), omdat zij werden getransplanteerd voordat zij de serie completeerden. Van vijf patiënten is onduidelijk of ze de serie afmaakten. Er werd gebruik gemaakt van twee vaccinatieschema's: regulier (N=36) en versneld (N=14). In het reguliere vaccinatieschema werd de serie door 16 patiënten (44%) niet afgemaakt en in het versnelde schema werd door 2 patiënten (14%) de serie niet afgemaakt (p 0.011). De verhouding tussen aantallen responders en non-responders was niet verschillend tussen het reguliere en versnelde vaccinatieschema (p 0.427). Ook andere mogelijk beïnvloedende factoren zoals het gebruik van steroïden en leeftijd waren niet statistisch significant.
Conclusie: In dit cohort longtransplantatiepatiënten maakte 54% de vaccinatieserie HBV af. Hiervan bereikte 59% geen adequate titer (non-responder). De responskans was niet verschillend tussen het regulier versus het versnelde schema. De kans op het afmaken van de vaccinatieserie was wel significant hoger bij het versnelde schema.

Sars-COV-2 in a cohort of lung transplant recipients: changes in mental health problems, medication adherence and lifestyle behaviour

M.J.C. Wessels-Bakker[1], A.D. van Zuilen[2], H.D. Luijk[3], C. Annema[4], W. Cahn[5], R. Schappin[6], [1]Divisie DIGD, afdeling Nefrologie HPno. F03.221, Universitair Medisch Centrum Utrecht, [2]Nefrologie, UMC Utrecht, [3]Longziekten, UMC Utrecht, [4]Gezondheidswetenschappen, sectie Verplegingswetenschap, UMC Groningen, [5]Psychiatrie, Universitair Medisch Centrum Utrecht, [6]Afdeling Dermatologie, Erasmus MC, Rotterdam, Nederland.

Background: Covid-19 infection posed a large threat for the lung transplant population. Prevention of contracting the disease was paramount for them. Both the fear for the disease as the changes patients had to implement in their daily life to protect themselves from infection could affect the sense of wellbeing and cause psychosocial distress. Additionally the strict isolation measures and suspense about the course of the pandemic could affect lifestyle behaviour like medication adherence, physical activity, sleep patterns, and dietary patterns.
Therefore the aim of this study was to explore the impact of the COVID-19 pandemic on lung transplant recipients regarding the course of symptoms of anxiety and depression, the course of medication adherence, and recipients' lifestyle behaviour.
Methods: An ongoing longitudinal study which ran from March 2018 to March 2021, in 112 lung transplant recipients. Data on symptoms of anxiety, depression, and medication adherence in lung transplant recipients was adapted to evaluate the impact of the COVID-19 pandemic on those symptoms. An additional questionnaire to assess the impact of the COVID-19 pandemic was added before the start of the COVID-19 vaccination programme in the Netherlands in January 2021.
Results: Symptoms of anxiety and depression before or during the COVID-19 pandemic appeared stable. Medication adherence decreased significantly from 99.0% at the start of the lockdown to 92.7% at the end of the study during the COVID-19 pandemic ($p = 0.0185$). In addition, 39% of the recipients did not change their daily physical activity level whereas 36% performed less daily physical activities and 22% performed more daily physical activity. Almost 41% of the recipients stopped exercising at the gym or physical therapist. This is roughly equal to numbers found in Dutch Society. The recipients' eating habits changed in 21%, mostly (61%) towards unhealthy food choices. This also is similar to changes in Dutch Society during the COVID-19 pandemic.
Conclusions: In lung transplant recipients, symptoms of anxiety and depression remained stable during the COVID-19 pandemic, however medication adherence deteriorated significantly. The majority of the lung transplant recipients were able to maintain a healthy lifestyle.

Lung injury evaluation after circulatory death followed by ventilation during warm ischemia and ex-vivo perfusion

M.M.A.R. Munhoz Assis Ramos[1,2], M.V.S. Marina[3], S.Y. Shuqi[3], M.A. Hu[4], R.F.H. Roland[5], M.E. Erasmus[6], A.C.B.F. Breithaupt-Faloppa[1], H. Leuvenink[7], [1]Cardiopneumologia, Universidade de São Paulo Sãoaulo, Brazilië, [2]Cardiopneumologia, UMC Groningen, [3]Chirurgie, UMC Groningen, [4]Afd. Cardiothoracale Chirurgie, UMC Groningen, [5]Thorax, UMC Groningen, [6]Cardiothoracale chirurgie /Transplantatie instituut, UMC Groningen, [7]Chirurgie, UMC Groningen, Nederland.

Background: Lung transplantation after circulatory death (DCD) is the last option to treat end-stage diseases. Lungs are highly affected organs and present a long transplantation waiting list. Worldwide, the majority of lung transplantation has controlled DCD classification III donors, who died at the hospital. To improve the donor pool, lungs from uncontrolled DCD donors, who died out-of-the hospital could be considered. This study aimed to investigate the effect of ventilation during the warm ischemia period in sheep lungs that underwent EVLP.
Methods: Lungs were procured from abattoir sheep. They were flushed with 37°C flush solution and kept ventilating, or not, for 2 hours. It was followed by 2h of cold storage. Finally, EVLP was performed for 4 hours with low-flow (20% of cardiac output) approach, pressure-controlled ventilation with self-made perfusion fluids. Lung biopsies, perfusate collection, respiratory values, circulatory pressures were recorded. Hourly blood gas analyses were performed.
Results: The ventilated through warm ischemia (V) and non ventilated group (NV) did not show differences in compliance, ventilation parameters or blood gas analysis. There was edema after the initial flush, but it was reverted after the EVLP.
Conclusions: Sheep lungs that were ventilated during 2h of warm ischemia presented similar outcomes to lungs that were not ventilated during this period. This can imply that organs originated from uncontrolled DCD donors, after EVLP, could be an option to donation.

The lung dashboard: new way of monitoring Dutch lung waiting list, transplants and outcomes

A.C. Hemke[1], B. Burg van den[2], C. Konijn[2], H.D. Luijk[3], L. Seghers[4,5], E.A.M. Verschuuren[6], [1]Beleid, Nederlandse Transplantatie Stichting, Leiden, [2]Informatiemanagement, Nederlandse Transplantatie Stichting, Leiden, [3]Longziekten, UMC Utrecht, [4]Dept. of Respiratory Medicine, Erasmus University Medical Center, Rotterdam, [5]Dept. of Respiratory Medicine, Erasmus MC Transplant Institute, Rotterdam, [6]Longziekten, UMCG, Groningen, Nederland.

Background: In 2023 there have been several developments to improve the distribution and analysis of waiting list, donation and transplant information in the Netherlands. In the public domain both trends and characteristics of all organ transplant programs are visible from the middle of 2023. Further the NTS and the organ advisory committees started the development of specific organ dashboards. The first organ specific dashboard that came available was the kidney dashboard. In the second half of 2023 the lung and heart dashboards have been developed in cooperation with the national thoracic transplantation advisory committee (LOTTO).
Methods: The lung dashboard is based on both the other already developed dashboards, as well as the lung waiting list report from 2018; in the lung dashboard the same groupings of Lung Allocations Scores (LAS) and primary diagnoses for lung transplantation (obstructive lung disease, pulmonary vascular disease, cystic fibrosis or immunodeficiency, restrictive lung disease, and other lung diseases) are being used.
Results: In the public domain it is already visible that in 2022 the number of patients on the lung waiting list have dropped significantly and that this was mainly due to the increased number of transplants performed in 2022 (122). In order to get more insight in these developments, using more recipient, donor and transplant details, as well as information on center level, the lung dashboard has been developed in cooperation with the 3 lung transplant centers represented in the LOTTO. The first version of the lung dashboard will be available on the membersite of the Dutch Transplant Foundation (NTS) from the end of 2023.
Conclusions: With the new lung dashboard it will be easier to monitor waiting list and transplant trends and identify factors that influence lung waiting list and transplant outcomes.

Pretransplant donor-specific Luminex HLA antibodies in kidney transplantation: innocent or not?

A.M. Brandsma[1], C.M. Ranzijn[1], S.A. Nurmohamed[2], N.C. van der Weerd[3], K.A.M.I. van der Pant[3], N.M. Lardy[1], F.J. Bemelman[3], [1]HLA diagnostiek, Sanquin, Amsterdam, [2]Nefrologie, Amsterdam Universitair Medisch Centrum, Amsterdam, [3]Nefrologie, Amsterdam UMC, Amsterdam, Nederland.

Background: The risk for acute rejection after kidney transplantation in the presence of pretransplant donor-specific HLA antibodies (DSA) that are only detectable by sensitive (Luminex-based) methods remains difficult to evaluate. Data on the influence of the mean fluorescence intensity (MFI) of DSA in this setting are scarce.
Methods: Patients transplanted during January 2021 until December 2022 were retrospectively analyzed for the presence of pretransplantation DSA and the occurrence of acute rejection episodes. MFI values of DSA (Immucor) and possible covariates were analyzed.
Results: In a total of 368 kidney transplantations (living and deceased donations), pretransplant DSA was found in 67 cases (18.2%). Biopsy-proven acute rejection of the graft was diagnosed in 39 patients. The presence of pretransplant DSA increased the risk for an acute rejection episode within the first 3 months after transplantation (4.6% vs 28.4%). 76% of DSA-positive patients with acute rejection had antibody-mediated rejection (ABMR) or a combination of ABMR and T-cell mediated rejection (TCMR). DSA-negative patients mainly had TCMR or a combination of ABMR and TCMR (83% TCMR or combination). The majority of the acute rejection episodes occurred within the first 14 days after transplantation. The MFI of the DSA did not correlate with the risk for acute rejection and there was no difference between DSA against HLA class 1 and/or class 2. In a multivariate analysis, pretransplant DSA was associated with acute rejection with a hazard ratio of 4.15 (95% CI 2.07-8.31, p<0.0001). Other independent risk factors for acute rejection were delayed graft function, ≥6 HLA mismatches (out of 10, HLA-A, -B, -C, -DRB1, -DQB1), and pretransplant recipient CMV IgG. The presence of pretransplant DSA alone did not correlate with higher proteinuria or lower eGFR one year after transplantation, while the occurrence of an acute rejection episode did (mean eGFR 51 vs 42 ml/min per 1.73 m^2). To further assess the risk of pretransplant DSA on a per-patient basis, retrospective flow cytometry crossmatching will be performed.
Conclusions: Pretransplant DSA was associated with an increased risk for acute rejection in kidney transplantation, irrespective of the DSA MFI. Once rejection occurs, the renal function is negatively affected. Increasing the immunosuppressive therapy during the first weeks after transplantation in patients with pretransplant DSA might be an approach to minimize this increased risk.

Novel minimally invasive diagnostics using AI-assisted high-dimensional morphology analysis distinguishes kidney transplant rejection with high accuracy at the single cell level

T.P.P. van den Bosch[1], M.C. Clahsen-van Groningen[1], S. Sinnadurai[1], J. Cruz[2], K. Boer[3], Z. Lian[2], R. Carelli[2], M. Nakaki[2], V. Lu[2], D.A. Hesselink[4], C.C.B. Baan[5], K. Miller[2], H. Hilal[1], R. Kramann[6 / 7 / 8], M. Salek[2], M. Masaeli[2], P.J. van der Spek[1], [1]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, Nederland, [2]Deepcell, Deepcell Inc., Menlo Park, CA, Verenigde Staten, [3]Internal Medicine, Transplant Institute, Erasmus MC, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, [6]Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, Nederland, [7]Internal Medicine, RWTH Aachen University, Medical Faculty, Aachen, [8]Internal Medicine, Institute of Experimental Medicine and Systems Biology, RWTH Aachen University, Aachen, Duitsland.

Background: Transplant rejection is one of the leading causes of graft failure in kidney transplant patients. To improve kidney transplant outcome, a novel minimally invasive monitoring tool is needed. This tool should detect kidney transplant rejection with high accuracy. Here we use REM-I, a novel high dimensional label-free single cell morphological profiling approach, to investigate the potential of quantitative cell morphology AI-assisted profiling to diagnose rejection in a minimally invasive manner.
Methods: A total of 30 single-cell suspensions of PBMCs (acute T cell-mediated rejection (aTCMR) n=8, active antibody mediated rejection (aAMR) n=11, and no-rejection n=11) were made containing 100,000-500,000 cells (ranging between 5–10 µm in cell diameter) at concentrations up to 500,000 cells/mL and aliquoted into 15 mL conical tubes. The samples were loaded onto a single-use microfluidic cartridge as part of the REM-I system and brightfield images of single cells were captured. For data analysis, images of all cells run through the REM-I instrument are automatically sent to the Deepcell Axon Suite, providing an analysis platform to visualize cell images from specific runs and generate UMAPs of the embedding space. Additional deep neural network models on samples in silico were run. The Axon Suite was used for data analysis, generated using the REM-I instrument and the Human Foundation Model (HFM) that applies deep learning and morphometrics to sort cells with distinct morphotypes.
Results: Cell morphology differences between all three conditions: no rejection (n = 37900), aTCMR rejection (n = 33329), aAMR rejection (n = 44511) were visualized on a 2D UMAP plot to represent 115 dimensions extracted by the HFM. Morphology UMAP of no-rejection PBMC samples showed 14 Leiden clusters, indicating 14 unique morphotypes present in the PBMC samples. Confusion matrix showed high classification accuracy in deep learning model performance for predicting no rejection versus all rejection samples. Local binary pattern (LBP), a measure of texture, and deep learning embeddings distinguished the different rejection types.
Conclusions: The REM-I platform using AI-assisted high-dimensional morphology analysis distinguishes kidney transplant rejection with 94% high accuracy at the single cell level. This novel minimally invasive diagnostic tool using PBMCs is the first of its kind with the potential to not only differentiate between patients with and without rejection, but also classify aAMR and aTCMR.

Repeated HLA-mismatches of either HLA class without detectable HLA-antibodies as adequately ruled out by the Luminex platform are not a risk factor for rejection or graft loss: A multicentre retrospective analysis.

D.A.J. van den Broek[1], J.C. van den Born[2], D. van der Helm[1], B.G. Hepkema[3], J.I. Rotmans[1], A.P.J. de Vries[4], D.L. Roelen[5], [1]Nierziekten, Leiden University Medical Centre, Leiden, [2]Nierziekten, University Medical Centre Groningen, [3]Transplantatie immunologie, Laboratoriumgeneeskunde, UMCG, Groningen, [4]Nierziekten, Leids Universitair Medisch Centrum, Leiden, [5]Immunologie, Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: Repeat transplantations constitute a noteworthy proportion of the overall field of renal transplantation. These patients are more often sensitised towards human leukocyte antigens (HLA) than first transplant candidates. Repeated HLA mismatches (RMM) with detectable antibodies convey increased risk for rejection and are therefore generally avoided. However, the risk of RMM without signs of circulating antibodies is uncertain, as robust research on this topic is lacking. This has caused dissent among transplant centres when assessing the risk these antigens pose. This multicentre analysis therefore aims to expand on this lack in evidence by determining the effects of RMM absent targeting antibodies on post-transplant outcomes.
Methods: We included renal graft recipients retransplanted between January 2009 and May 2023 at two Dutch transplant centres, who were analysed for donor-specific antibodies (DSA) using the Luminex platform for both HLA classes in at least the last 6 months before transplant. Positive screening Luminex assays required follow-up by single-antigen bead analysis. Desensitised patients, those with prior detectable DSA and patients with antibodies targeting antigens wherefore the donor was not genotyped were excluded. RMM were defined at the split antigen level of HLA- A, B, Cw, DRB1, DQB1 or DPB1 loci. Patients with broad level RMM, but without known donor or recipient split typing for that locus were excluded, as well as patients with RMM only at the DRB3,4,5 locus. Transplant outcome data was extracted from the transplant databases of the participating centres.
Results: Of the 427 repeat transplant patients identified, we included 243 patients in our analysis based on the set inclusion criteria. Of these, 173 had no RMM, 44 only had class I RMM and 26 had at least class II RMM. The median follow up time was 4.6 years (IQR 4.92). At 5 years post-transplant, total graft survival was 0.78 (0.70 – 0.84) vs 0.75 (0.59 – 0.86), death-censored graft survival (DCGS) was 0.91 (0.85 – 0.95) vs 0.87 (0.71 – 0.94) and survival from biopsy proven rejection (BPAR) was 0.82 (0.75 – 0.87) vs 0.85 (0.73 – 0.92), for no RMM vs RMM respectively. No significant differences were found between the groups for these outcome measures. When corrected for patient age, donor type, centre and HLA A, B and DR mismatch, no significant effect of either RMM or RMM class on graft survival, DCGS or BPAR was found.
Conclusions: RMM of either HLA class to which patients have never shown signs of immunization through modern antibody detection assays convey no significantly increased risk for either graft loss or rejection. These antigens should therefore not be listed as unacceptable for transplant.

Blood group antibody titers in long-waiting candidates for ABO-incompatible kidney exchange program transplantation: a retrospective cohort study.

M.F. Klaassen[1], M. de Klerk[1], J.A. Kal-van Gestel[1], M.L. Kho[2], J. van de Wetering[3], Z. Al Fatly[1], M.E.J. Reinders[3], J.I. Roodnat[4], A.E. de Weerd[1], [1]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [2]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Nefrologie, Erasmus MC, Rotterdam, Nederland.

Background: Currently, the national kidney exchange program (KEP) is implementing Cross-over+, with altered allocation settings allowing ABO-incompatible (ABOi) kidney transplantation in long-waiting candidates. This new setting has been pioneered in our center and requires monitoring of blood group antibody titers in long-waiting patients to determine eligibility for ABOi KEP transplantation.
Methods: Long-waiting patients (≥2 years on dialysis) participating in our local KEP between 2017 and October 2023 were included in this retrospective cohort study. The primary objective was to investigate anti-A and anti-B IgG antibody titers, which were measured with the Ortho QC-kit using commercial erythrocytes. IgG titers ≤1:256 were considered acceptable for ABOi KEP transplantation. Graft survival and patient survival were measured for all performed ABOi KEP transplants.
Results: Out of 134 long-waiting KEP candidates, 110 had blood group titers available and were included in the analysis. Blood group O was most common (43%), followed by B (34%), A (21%) and AB (3%).
19 patients (17%) had titers unfit for ABOi KEP transplantation. All were blood group O patients, except for one blood group B patient. Titers above threshold were anti-A in 14 (74%), anti-B in 3 (16%), and combined anti-A and anti-B in 2 (11%) patients. Of the blood group O patients, 38% had titers above threshold and 19% had titers on threshold (1:256). All blood group A and B patients had titers below 1:256, except for the before mentioned blood group B patient (1:512). Of the 33 patients with repeated measurements, 31 had at most a variation of 2 dilution steps in titers.
Out of the 79 transplants in our local pilot KEP, nine (11%) were performed ABOi. Median dialysis vintage was 3.7 years, six patients had virtual panel-reactive antibodies ≥85% (mean 97%) and four were retransplantations. Median follow-up after transplantation was 1.4 years (range 20 days to 6.2 years). Patient survival was 100% and cumulative death-censored graft survival was 78%.
Conclusions: Allowing ABOi transplantation increases the donor pool for long-waiting and immunized kidney transplant candidates. However, over one third of blood group O patients have titers unfit for ABOi KEP transplantation. We recommend testing blood group antibody titers in long-waiting patients prior to participation in Cross-over+. We suggest repeating measurements in patients with titers on threshold or one dilution step below.

Cross-over+ allocation as compared to historical kidney exchange transplantations: a Monte Carlo simulation.

M.F. Klaassen[1], J. van de Wetering[2], J.A. Kal-van Gestel[1], M. de Klerk[1], A.C. Hemke[3], C. Konijn[4], M.C. Baas[5], F.J. Bemelman[6], H. Bouwsma[7], M.H.L. Christiaans[8], M.F.C. de Jong[9], A.D. van Zuilen[10], T. Dollevoet[11], K. Glorie[12], M.L. Kho[13], J.I. Roodnat[14], M.E.J. Reinders[2], A.E. de Weerd[1], [1]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [2]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [3]Beleid, Nederlandse Transplantatie Stichting, Leiden, [4]Informatiemanagement, Nederlandse Transplantatie Stichting, Leiden, [5]Dept. of Internal Medicine, Radboud University Medical Center, Nijmegen, [6]Nefrologie, Amsterdam UMC, Amsterdam, [7]Dept. of Internal Medicine, Leiden University Medical Center, Leiden, [8]Nefrologie, Maastricht UMC+, Maastricht, [9]Interne Geneeskunde, onderafdeling Nefrologie, UMC Groningen, [10]Nefrologie, UMC Utrecht, [11]Erasmus School of Economics, Erasmus University Rotterdam, Rotterdam, [12]Erasmus Q-Intelligence, Erasmus University Rotterdam, Rotterdam, [13]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam,[14]Nefrologie, Erasmus MC, Rotterdam, Nederland.

Background: The national kidney exchange program (KEP) is currently implementing Cross-over+, that combines transplantation programs for exchange donation, altruistic donation, ABO-incompatible (ABOi) transplantation for long waiting patients, and low level HLA-incompatible (HLAi) transplantation in selected highly immunized patients. While this new allocation has improved transplant rates for difficult-to-match patients in a single center, the impact of Cross-over+ on the national KEP is currently unknown.
Methods: MONTEKEP is a national study in collaboration with the Dutch Transplant Foundation and all seven Dutch transplant centers. Simulations will be performed on a database from 2018-2022, that contains historical data of the couples in KEP, altruistic donors (including local donors) and the waitlist. The effect of changes to the national KEP will be investigated via Monte Carlo simulation, which performs scenario analyses by running multiple simulations with randomized samples. To be able to compare the simulations with historical transplant rates in KEP, we investigated the KEP results from 2018-2022. We also collected the number of local altruistic donations.
Results: In the period studied, 394 couples and 18 altruistic donors participated in KEP. 50% of the couples were ABOi, 35% HLAi, 11% combined ABOi/HLAi, and 4% compatible. 23% of the recipients had panel-reactive antibodies (PRA) ≥85%. Blood type O was the most common (61%), followed by A (26%), B (11%) and AB (2%).
In reality, 67% of the couples were transplanted. By the end of 2022, 14% were still on the waitlist, while 19% had been removed. 114 couples (29%) were transplanted within KEP. Alternatively, 109 couples (28%) were transplanted outside KEP with a living donor, and 41 (10%) with a deceased donor. Transplant rates in KEP were lower for blood type O (20%), as compared to blood type A (44%) and B (46%). Only 16% of patients with PRA ≥85% were transplanted in KEP.
Nine altruistic donors donated in the national KEP, whereas a total of 132 altruistic donors did not participate in KEP and donated in their own center.
Conclusions: The low transplant rates for difficult-to-match patients in KEP has led to the implementation of Cross-over+. National participation of altruistic donors (even by local donation that starts a national chain) has the potential to improve transplant rates, also for difficult-to-match patients on the waitlist. Currently, we are finalizing the database to perform Monte Carlo simulations.

Development of a decentralized epitope matching simulation model to improve kidney transplantation outcomes.

R.A. van Amerongen[1], B.M. Matern[2], M. Niemann[3], E. Spierings[4], [1]CTI, University Medical Center Utrecht, Nederland, [2]Bioinformatics, PIRCHE AG, Berlin, [3]Technology, PIRCHE AG, Berlijn, Duitsland, [4]Center for Translational Immunology, University Medical Center Utrecht, Nederland.

Background: The Eurotransplant kidney allocation system (ETKAS) traditionally relies on HLA matching. However, multiple studies demonstrated that epitope-based matching enhance outcomes. While a simulated centralized epitope-based strategy demonstrated success, practical challenges hinder its integration into ETKAS. The current SIMFONTEX (SIMulations FOr New Transplant EXperiences) study is based on ETKAS allocation principals, but simulates a decentralized approach, where regional centers may adopt the 'SIMFONTEX' epitope matching or rely on traditional matching.
Methods: Using discrete time steps, allocation simulations were conducted and outcomes were compared in two scenarios. In the first scenario, the SIMFONTEX strategy was applied to 10% of Dutch patients (representing a single center) and up to 100% in the second. For each scenario, SIMFONTEX patients were assigned additional random unacceptable antigens as part of the strategy, increasing their PRA to different 'target PRAs' in the range 0%-95% in different simulations.
Results: According to our results, effects on allocation outcomes in both scenarios were mainly observed for Dutch SIMFONTEX patients and were more noticeable if the target vPRAs was set to 75% or more. Shifts in the point distribution were observed for transplanted SIMFONTEX patients: In both scenarios, they received more points for their mismatch probability. Specifically in the second scenario, they also received more points for the country balance, as the number of exchanged kidneys increased drastically above a target vPRA above 75%. The increase was matched by a decrease in the points from waiting time in both scenarios.
Conclusions: The proposed SIMFONTEX strategy thus seems like a viable allocation strategy given that the target vPRA is set to 50% or lower. Higher vPRAs of SIMFONTEX patients might lead to unintended effects on their point distribution and waiting time. When applied nationally, the international kidney exchange might also increase as the majority of national kidneys are refused. Future simulations will focus on verifying these findings and adjusting unacceptable antigens based on preconstructed epitope risk profiles instead of random assignment.

Experimental data on PIRCHE and T-cell reactivity: HLA-DPB1-derived peptides identified by PIRCHE-I show binding to HLA-A*02:01 in vitro and T-cell activation in vivo.

E.T.M. Peereboom[1], A.E.M. Maranus[1], L.M. Timmerman[1], K. Geneugelijk[2], E. Spierings[3], [1]Center for Translational Immunology, UMC Utrecht, [2]Central Diagnostic Laboratory, UMC Utrecht, [3]Center for Translational Immunology, University Medical Center Utrecht, Nederland

Background: Human leukocyte antigen (HLA)-DPB1 mismatches during hematopoietic stem cell transplantation (HSCT) with an unrelated donor result in an increased risk for the development of graft-versus-host disease (GvHD). The number of $CD8^+$ T-cell epitopes available for indirect allorecognition as predicted by the PIRCHE algorithm has been shown to be associated with GvHD development. As a proof of principle, PIRCHE-I predictions for HLA-DPB1 mismatches were validated *in vitro* and *in vivo*.
Methods: PIRCHE-I analysis was performed to identify HLA-DPB1-derived peptides that could theoretically bind to HLA-A*02:01. PIRCHE-I predictions for HLA-DPB1 mismatches were validated *in vitro* by investigating binding affinities of HLA-DPB1 derived peptides to the HLA-A*02:01 in a competition-based binding assay. To investigate the capacity of HLA-DPB1 derived peptides to elicit a T cell response *in vivo*, mice were immunized with these peptides. T-cell alloreactivity was subsequently evaluated using an interferon-gamma ELISpot assay.
Results: The PIRCHE-I algorithm identified five HLA-DPB1 derived peptides (RMCRHNYEL, YIYNREEFV, YIYNREELV, YIYNRQEYA and YIYNREEYA) to be presented by HLA-A*02:01. Binding of these peptides to HLA-A*02:01 was confirmed in a competition-based peptide binding assay, all showing an IC_{50} value of 21 μM or lower. The peptides elicited an interferon-gamma response *in vivo*.
Conclusions: Our results indicate that the PIRCHE-I algorithm can identify potential immunogenic HLA-DPB1-derived peptides during HSCT with a matched unrelated donor. This study provides evidence that the PIRCHE-I algorithm could be used to identify HLA-DPB1 mismatches that are at risk for GvHD development in patients receiving HSCT.

Donor plasma cystatin C, but not creatinine, is associated with measured GFR at one year after kidney transplantation.

I.J.C. Dielwart[1], D. Kremer[2], D. Groothof[3], T.J. Knobbe[4], M. van Londen[5], H. Leuvenink[6], J.E. Kootstra-Ros[7], M.H. de Borst[3], R.A. Pol[6], S.J.L. Bakker[8], [1]Interne geneeskunde | chirurgie, UMC Groningen, [2]Interne Geneeskunde, Nefrologie, UMC Groningen, [3]Interne geneeskunde, UMC Groningen, [4]Interne geneeskunde, Nefrologie, UMC Groningen, [5]Nefrologie, UMC Groningen, [6]Chirurgie, UMC Groningen, [7]Laboratoriumgeneeskunde, UMC Groningen, [8]Interne Geneeskunde, UMC Groningen, Nederland.

Background: While widely used during deceased kidney donor selection, donor plasma creatinine has limited capacity to predict future recipient graft function. Cystatin C is a muscle-mass independent protein that could be a more reliable biomarker for this purpose. However, the association between donor cystatin C and subsequent recipient graft function remains unclear.
Methods: We investigated the association between pre-donation donor cystatin C concentration, in comparison with creatinine concentration, and the recipients' measured GFR (mGFR) one year after kidney transplantation. Plasma cystatin C was measured using a validated particle-enhance turbidimetric immunoassay (Roche). Kidney graft function was measured using ^{125}I-iothalamate mGFR as part of the outpatient follow-up. Associations of donor plasma cystatin C and creatinine concentrations with recipients' mGFR one year after transplant were assessed using linear regression analyses.
Results: A total of 53 kidney transplant recipients (53% male, age 57 ± 12 years) received a kidney from 53 deceased kidney donors (55% male, age 47 ± 18 years, 47% donation after circulatory death). Median plasma creatinine and cystatin C concentrations were 64 [55 to 82] µmol/L and 0.64 [0.51 to 0.82] mg/L respectively. Mean mGFR one year after transplant was 52.7 ± 17.1 ml/min. In univariable linear regression analyses, higher donor cystatin C was significantly associated with lower mGFR (β -0.42, 95% CI (-0.67 to -0.16), p=0.002), while donor creatinine was not associated (β -0.03 95% CI (-0.32 to 0.25), p=0.81). After adjustment for potential confounders, including donor sex and age, the association between donor cystatin C and recipients' mGFR remained significant (p=0.008).
Conclusions: Higher donor cystatin C is associated with lower measured GFR one year after kidney transplant, while donor creatinine is not. Consequently, donor cystatin C could serve as a more reliable selection criteria and may be considered for inclusion in the assessment of deceased kidney donors.

The value of abdominal CT-scan in deceased organ donor screening

J.W. Mensink[1,2], J.C. Korving[3], K.A. Chotkan[4,5], W.N. Nijboer[6], L.F.M. Beenen[7], H. Putter[8], M.C.G. van de Poll[9], A. Baranski[4], R.A. Pol[10], A.E. Braat[4], [1]Dept. of Surgery, Division of Transplantation, Leiden University Medical Center, Leiden, [2]Dept. of Surgery, Division of Transplantation, Dutch Transplant Foundation, Leiden, [3]Dept. of Radiology, Reinier de Graaf, Delft, [4]Heelkunde, Leids Universitair Medisch Centrum, Leiden, [5]Heelkunde, Nederlandse Transplantatie Stichting, Leiden, [6]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, [7]Dept. of Radiology, Amsterdam University Medical Center, Amsterdam, [8]Biomedical Data Sciences, LUMC, Leiden, [9]Intensive Care, Maastricht University Medical Center, Maastricht, [10]Chirurgie, UMC Groningen, Nederland.

Background: In the past decades Computed Tomography scan (CT-scan) is increasingly used as diagnostic tool to assess different categories of patients. It has become indispensable in the diagnosis and work up of polytrauma patients, oncology patients and patients suspected of major vascular or gastrointestinal pathology. According to the Guide to the Quality and Safety of Organs for Transplantation (8th edition) only chest x-ray and abdominal ultrasound is specified as basic imaging for deceased donor assessment. This study investigates the potential value of abdominal CT-scan and the use of a standardized report in deceased organ donation.
Methods: All potential organ donors in the Netherlands reported to Eurotransplant between January 2013 and December 2018 were included. Incomplete abdominal scans were excluded. All CT-scans and corresponding radiology reports were collected. CT-scans were revised by a dedicated radiologist using a standardized survey assessing organ quality and variations in (vascular) anatomy. The radiology reports were scored by two investigators using the same survey. These results were compared to determine the potential value of CT-scans and standardized surveys by a dedicated radiologist.
Results: In 264 (16.0%) of all 1.645 potential organ donors abdominal CT-scans had been performed. A preliminary analysis of 58.3 % of all data suggests that 18 scans (11.7%) were performed for the sole purpose of organ donor screening. Information regarding quality of kidney or liver parenchymal was not reported in 12.0% and 9.7% of cases respectively. Moreover, no information of space occupying lesions in kidneys (19.8%) and livers (18.2%) and vascular anatomy in kidneys (90.3%) and livers (92.9%) was mentioned in the radiology report. Reassessment of CT-scans showed aberrant arterial kidney anatomy in 24.4% compared to 1.6% in the original reports. Aberrant arterial liver anatomy was found in 28.6% cases compared to 1.3% in the original reports.
Conclusions: The indication of most scans performed on potential organ donors is not determining organ donor suitability. Even if so, not all reports are structured in a standardized, comprehensive manner. This preliminary analysis suggests an additional value of CT-scans in deceased organ donor screening resulting in detailed information on organ quality, measurements and vascular anatomy. Confirmation with the final analysis of all results is currently being performed and will be presented.

Pre transplant residual diuresis and oxalic acid concentration significantly and independently influence kidney graft survival

G. Post Hospers[1], M. Laging[2], W.J. Visser[3], J.G.H.P. Verhoeven[4], P.M. Miranda Afonso[5], I.R.A.M. Mertens zur Borg[6], D.A. Hesselink[7], A.M.E. de Mik-van Egmond[8], M.G.H. Betjes[9], M. van Agteren[4], D. Severs[4], J. van de Wetering[7], R. Zietse[4], M.J. Vos[10], I.P. Kema[10], M.L. Kho[11], M.E.J. Reinders[7], J.I. Roodnat[12], [1]Transplant Institute, Erasmus Medical Center,, [2]Interne Geneeskunde, Erasmus MC, Rotterdam, [32]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center,, [4]Transplant Institute, Erasmus Medical Center, Rotterdam, [5]Biostatistiek, Erasmus MC, Rotterdam, [65]Dept. of Anesthesiology, Erasmus Medical Center, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [82]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center;, [9]Erasmus MC Transplant Institute, Division of Nephrology and Transplantation, [10]Clinical Chemistry Metabolic diseases, Groningen, [11]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, [12]Nefrologie, Erasmus MC, Rotterdam, Nederland.

Background: Oxalic acid is a tubulotoxic waste product that accumulates when kidney function deteriorates. Crystallization and precipitation occurs when plasma concentrations exceed 30-40 µmol/L. We studied the influence of oxalic acid and its precursors and residual kidney function on kidney transplant outcome.
Methods: Patients who received a kidney transplant between September 2018 and January 2022 participated in the study. Concentrations of oxalic acid, glyoxylic acid, glycolic acid and glyceric acid were determined in pre-transplant blood samples. Data on residual diuresis and other recipient, donor or transplant related variables were recorded. Follow-up was until July 1st 2023.
Results: 496 patients were included, 154 were not on dialysis yet (31%). In 252 patients residual diuresis was ≤1000 mL/day (51%), there were 113 patients with residual diuresis ≤100 mL/day (32.1%). Living donor transplantation was performed in 230 patients , a DCD donor transplantation in 178 patients. Oxalic acid concentrations were above upper normal concentration in 98.8% of patients. Oxalic acid concentration was ≥40 µmol/L in 41% of patients. There were 52 graft failures. In univariable Cox analysis, amongst others, oxalic acid, and residual diuresis both as continuous and as categorical variable exerted a significant effect on the graft failure risk. In multivariable Cox analysis the risk of graft failure censored for death was significantly influenced by residual diuresis, donor type and donor age. Oxalic acid exerted a significant effect when categorised in three groups:<40, 40-80 and >80 µmol/L. There was no interaction between oxalic acid and residual diuresis, so the effects are independent and additional. Four year graft survival in recipients of a deceased donor kidney was 95% in recipients with residual diuresis>1000ml/day and oxalic acid concentration <40 µmol/L; and 58% in recipients with residual diuresis <1000 mL/day and oxalic acid >80 µmol/L. In living donor kidney recipients these percentages were: 98% and 80%. Patient death was significantly influenced by recipient age, CRP, glyceric acid concentration and dialysis type. It was not influenced by oxalic acid and residual diuresis.
Conclusions: Residual diuresis and oxalic acid concentration are important and independent predictors of graft failure censored for death. Efforts to maintain residual diuresis and/or pre-emptive transplantation may have a positive effect on kidney transplant outcomes.

Peri-transplant damage impacts early immune activation following kidney transplantation

R.C. Dijkland[1], H. Putter[2], H.S. Spijker[3], I.P.J. Alwayn[4], J.H.N. Lindeman[1], D.K. de Vries[5], [1]Heelkunde, LUMC, Leiden, [2]Biomedical Data Sciences, LUMC, Leiden, [3]Interne Geneeskunde, LUMC, Leiden, [4]Heelkunde, divisie transplantatie, LUMC, Leiden, [5]Heelkunde, LUMC, Leiden, Nederland.

Background: Peri-transplant injury and delayed graft function (DGF) have been linked to immunological priming. With novel developments such as normothermic machine perfusion, opportunities emerge to decrease or modulate peri-transplant damage. To evaluate the impact of peri-transplant damage as an immunological primer, we performed a regression analysis using different forms of peri-transplant damage and other risk factors, like HLA-mismatches, donor and recipient age, and ischemic times of grafts donated after Brain Death (DBD), after Circulatory Death (DCD), living-related (L-R) and living-unrelated (L-U) donors. The impact of DGF was exclusively studied in deceased donor grafts.
Methods: Utilizing UK outcome data of all primary kidney transplants (n=41729), a negative binomial regression analysis was conducted to assess the association between graft injury and rejection episodes. To minimize interference by differences in HLA-matching and damage related to DGF, the primary analysis was performed for transplantations with 0 HLA-DR mismatches and no DGF. The impact of DGF was evaluated for the two deceased donor groups. Incident rejection episodes at 3 months and 1-year were used as a measure of early immune activation. Other factors included were donor and recipient age and the amount of HLA mismatches.
Results: The primary analyses confirm a negative association between the recipient age and the amount of rejection episodes (0.8% decrease), and a positive association between donor age and the amount of rejection episodes (1.9% increase). Comparison of the four donor groups shows the least rejection episodes in the L-R and DCD group. L-U and DBD experienced 80% more rejection episodes. A strong association was found between HLA-DR mismatches and rejection episodes for living donor grafts, with 80% more rejection episodes in L-U and 190% more in L-R. DGF doubles the amount of rejection episodes for the deceased donor grafts.
Conclusions: L-R and DCD grafts are comparable in the amount of rejection episodes, even though DCD organs are from unrelated donors. This implies that peri-transplant damage is not the only factor that plays a role in early immune activation. The contrast between DCD and DBD illustrates the association between brain death and rejection. The association of DGF with rejection implies that the peri-transplant damage may initiate an early immune response.

The superiority of Double-J Stenting in kidney transplantation

C.A.J. Oudmaijer[1], K. Muller[1], J.N.M. IJzermans[1], T. Terkivatan[1], E. van Straalen[1], R.C. Minnee[2], H.J.A.N. Kimenai[2], [1]Division of Hepatobiliary and Transplantation Surgery, Erasmus MC Transplant Institute, Rotterdam, [2]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: Kidney transplantation is the best treatment for patients with chronic kidney failure. Urological complications after kidney transplantation are associated with significant morbidity, surgical and radiological interventions, prolonged hospital stay and even mortality. The majority of urological complications are related to the ureteroneocystostomy and the first treatment for leakage or stenosis of the anastomosis is placement of a percutaneous nephrostomy (PCN) drain. Iintra-ureteroneocystostomy stent placement can minimize urological complications. Two types of ureteral stents can be used; an internalized Double-J stent and an externalized Single-J stent. The Double-J stent has been reported to have a better outcome with less urological complications of 0-5.4%. Unfortunately, all these studies are retrospective in nature.
Methods: To assess if Double-J stenting of the ureteroneocystostomy during kidney transplantation is superior in preventing urological complications compared to externalized Single-J stenting.
This was a single-centre randomised controlled trial. All adult kidney transplant recipients were invited to participate, but recipients with urological malformations or focal segmental glomerulosclerosis were excluded. Patients were randomised during surgery to either an externalized Single-J stent, removed after 10-days during the same admittance, or an internal Double-J stent that was removed by cystoscopy 3-4 weeks after transplantation. The primary outcome was PCN placement within six months after transplantation.
Results: The study ran from December 2018 to Augustus 2023, during which 300 recipients were included. In the preliminary analysis, 279 out of 300 subjects had completed follow-up. The final analysis will be performed early January 2024. PCN was performed in 15.7% in the Single-J group (21/134) and 4.8% in the Double-J group (7/145), p = 0.003. Univariable logistic regression resulted in an OR of 0.27 [0.10, 0.64] (OR [95%CI]) for PCN in the Double-J arm. Multivariate logistic regression, showed a consistent OR of 0.26 [0.10, 0.61] (OR [95%CI]). Duration of surgery, warm- and cold ischemia were comparable across groups. Occurrence of rejection, graft failure, primary non-function, urinary tract infections, urosepsis and tacrolimus toxicity were comparable across groups. Cost-effectiveness analysis clearly favoured the Double-J Stenting.
Conclusions: Reducing the number of urological complications after kidney transplantation has high priority, and in this trial, we found that Double-J consistently reduces urological complications from 16% to 4%. These findings justify the additional cystoscopy and its rare complications.

Lifestyle intervention to improve physical fitness and health-related quality of life after kidney transplantation: the active care after transplantation (ACT) randomized clinical trial

T.J. Knobbe[1], D. Kremer[2], D.Z. Zelle[3], G. Klaassen[3], I.M.Y. van Vliet[4], P.B. Leurs[5], F.J. Bemelman[6], M.H.L. Christiaans[7], S.P. Berger[1], G.J. Navis[2], S.J.L. Bakker[8], E. Corpeleijn[9], [1]Interne geneeskunde, Nefrologie, UMC Groningen, [2]Interne Geneeskunde, Nefrologie, UMC Groningen, [3]Interne geneeskunde, Nefrologie, University Medical Center Groningen, [4]Dietitiek, UMC Groningen, [5]Interne geneeskunde, Nefrologie, Admiraal de Ruyter Ziekenhuis, Goes, [6]Nefrologie, Amsterdam UMC, Amsterdam, [7]Nefrologie, Maastricht UMC+, Maastricht, [8]Interne Geneeskunde, UMC Groningen, [9]Epidemiologie, University of Groningen, Nederland

Background: Robust evidence for interventions to improve physical fitness and health-related quality of life (HRQoL) after kidney transplantation is lacking. We assessed whether a lifestyle intervention improves physical fitness and HRQoL among kidney transplant recipients.
Methods: In this multicenter, open-label, parallel-group, randomized controlled trial, kidney transplant recipients were randomized 1:1:1 to exercise intervention, exercise + diet intervention, or usual care. Participants were recruited in six hospitals across The Netherlands. The exercise intervention consisted of three-months supervised exercise (twice weekly) followed by 12 months of lifestyle coaching, with additional 15 months dietary counseling (12 sessions) for the exercise + diet group. The primary outcomes were exercise capacity (peak O_2 uptake and peak power output, measured using symptom-limited cycle/VO_2 peak ergometry), muscle strength (mean of four muscle groups), body weight, and HRQoL-domain physical functioning (Short-Form 36).
Results: A total of 221 outpatient kidney transplant recipients were included (38% female, age 53±13y, median 5 [4-8] months post-transplantation). In Multilevel General Linear Mixed models, sustained beneficial treatment effects of exercise were observed on exercise capacity and muscle strength ($P_{treatment\ effect}$<0.05 for all). The intervention prevented weight gain in females ($P_{treatment\ effect}$<0.05). HRQoL-domain physical functioning improved sustainably in patients on exercise therapy ($EMM_{15\ months}$ +19%, 95%CI: +8 to +29) but not in the control group ($EMM_{15\ months}$ +4%, 95%CI: -12 to +20, $P_{treatment\ effect}$=0.11). Additional dietary counseling yielded no effects on the assessed outcomes ($P_{treatment\ effect}$>0.05 for all).
Conclusions: 3-month exercise therapy improved exercise capacity and muscle strength, prevented weight gain in females, and tended to improve HRQoL-domain physical functioning. Treatment effects persisted one year after the exercise intervention. These findings suggest that short-duration lifestyle intervention can have sustained beneficial health effects in kidney transplant recipients.

Are recipients happy with SElf-Care after REnal Transplantation (SECRET)? A retrospective evaluation of protocol adherence, continuation and opinions of the Home-Monitoring System

B. Hezer[1], M.E.J. Reinders[2], M.W.F. van den Hoogen[3], M. Tielen[4], J. van de Wetering[2], D.A. Hesselink[2], E.K. Massey[5], [1]Internal Medicine, MC Transplant institute, Nephrology and Transplantat, Erasmus MC, Rotterdam, [2]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation,, Erasmus MC, Rotterdam, [5]Erasmus MC Transplant Institute, Dept of Internal Medicine, Erasmus MC, Rotterdam, Nederland.

Background: Innovations in telemedicine, such as teleconsultations and home-monitoring of clinical parameters, are rapidly developing in the field of transplantation. In order to facilitate monitoring and treatment at home, we implemented the 'SelfCare after Renal Transplantation' (SeCReT) box and a smartphone application (Luscii®). In this study we evaluated protocol adherence, continuation and subjective evaluation of this home-monitoring system after kidney transplantation.
Methods: The SeCReT-box contained medically certified devices including a thermometer, pulse-oximeter, weighing scale and blood pressure monitor. All de novo kidney transplant recipients were eligible for inclusion. Data collection was carried out between 01-07-2021 to 31-12-2022. The protocol in Luscii® included measurement of vital parameters (SeCReT-box), questionnaires (on wound healing, pain, stool frequency, smoking, sexual problems, adherence via BAASIS® and satisfaction with the home-monitoring program). Measurements were shown in a dashboard which was integrated to the electronic patient file (HIX® by Chipsoft). In the first 2 weeks, the protocol stipulated multiple daily measures using the SeCReT-box, after which intensity reduced to weekly measurements.
Results: A total of 297 patients underwent kidney transplantation during the study period of which 198 were initiated into the home-monitoring (HM) program. 162 users that activated the app and entered measurements were included in this analysis. The mean age was 54.7 and ranged from 20 to 82 at inclusion. Protocol adherence was 14 out of 161 (9%) in the first two weeks but after that increased to 131 out of 150 (87%) and remained relatively stable after 1 year. Continuation of use was high, with only 2 dropouts in the first 2 weeks. There were 183 evaluations collected from 84 participants with 50 participants evaluated multiple times, 92% would recommend HM to others and 85% evaluated the HM system as positively. Mixed results on the healthcare needs were found: 58% reported lower needs due to HM while 21% reported higher needs.
Conclusions: Uptake and continued use of home-monitoring was very high among this recently eligible transplanted group of kidney transplant recipients. The protocol adherence for entering measurements was higher when the protocol was less intensive. Further qualitative research is needed on barriers and facilitators of use, in order to promote uptake and adoption among all various target groups in transplant recipients.

Parenthood after kidney and liver transplantation: perspectives from both parents and their children

J.R. Meinderts[1], C. van Weezel[1], L.X.Y. ten Have[1], D. Winter[1], F.G.I. van Vilsteren[2], S.P. Berger[3], J.R. Prins[4], A.V. Ranchor[5], M.F.C. de Jong[1], [1]Interne Geneeskunde, onderafdeling Nefrologie, UMC Groningen, [2]Maag-darm-leverziekten, UMC Groningen, [3]Interne geneeskunde, Nefrologie, UMC Groningen, [4]Obstetrie en Gynaecologie, UMC Groningen, [5]Gezondheidswetenschappen, sectie Gezondheidspsychologie, UMC Groningen, Nederland.

Background: Pregnancy in organ transplant recipients is considered to have increased risks for mother and fetus. Therefore, preconception counseling is offered to discuss medical risks and possibilities. The psychological impact of pregnancy and the upbringing of a child after transplantation is largely unknown and often not discussed. This study aims to explore and understand experiences of female transplant recipients and the father of their child(ren) during pregnancy, and of both parents and children during childhood.
Methods: This qualitative cohort study was conducted in a Dutch multi-organ transplant center. Data was obtained via semi-structured online interviews and from patient records. Families with a pregnancy after kidney or liver transplantation (KT or LT) were invited for interviews on experiences during pregnancy and during upbringing. Recordings of the interviews were transcribed ad verbatim. An inductive coding approach was used. Themes and subthemes were identified and color coded.
Results: We conducted 25 interviews; 14 mothers (7 KT, 7 LT), 7 fathers and 4 children aged >16 years. In the preconceptional phase the opinion of their physician on the possibility of pregnancy was very important for most families. Most families did not consider long-term health consequences of the transplantation nor the possibility of graft loss or maternal death. During pregnancy fathers were more often concerned about their wife's health and possible graft function decline than mothers themselves. During the upbringing most families considered themselves "just like any other family" and did not experience limitations in daily life. Some families, mostly in the KT group, did experience a lack of energy. Again, fathers worried more about the future. There were no concerns about the health of the children, although some families were extra watchful when there were symptoms. Some families emphasized that the consequences of transplantation affected the emotional wellbeing of their children, for example because of repeated maternal hospital admission. The children recognized this as well. Specifically, the father and offspring emphasized the need for psychological guidance during for example maternal hospital admission. In some families there was a significant decline in graft function and these families realized that life went from "normal" back to "patient" with the focus shifting towards the disease.
Conclusions: To our best knowledge, this is the first study to assess experiences of the entire family in pregnancies after KT and LT. Most families had a positive experience. However, the results also underline the need for additional psychological counselling for especially the father and offspring.

Antiplatelet prophylaxis reduces the risk of early hepatic artery thrombosis following liver transplantation in high-risk patients

S. Darwish Murad[1], I. Minciuna[1], J. de Jonge[2], C. den Hoed [1], R. Maan[1], W.G. Polak[3], R.J. Porte[3], H.L.A. Janssen[1], B. Procopet[4], [1]MDL, Erasmus MC Transplant Institute, Rotterdam, [2]Surgery, Erasmus MC, Rotterdam, [3]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland, [4]MDL, Regional Institute of Gastroenterology and Hepatology "O. Fodor", Cluj-Napoca, Roemenië.

Background: The prevention of hepatic artery thrombosis (HAT) is pivotal for graft survival immediately after liver transplantation (LT). This study aimed to identify the surgical, donor and recipient related risk factors (RF) for early HAT (eHAT) and assessed the benefit of antiplatelet prophylaxis (AP).
Methods: This retrospective single-centre study included 854 patients who underwent primary LT between 2007-2022. Surgical RF for eHAT were predefined as arterial reconstruction, arterial anastomosis redo, arterial conduit, intraoperative arterial clotting during implantation resolved by immediate thrombectomy, or intraoperative fragile aspect. AP was offered pre-emptively for three months for such patients at the operating surgeons discretion. Primary endpoint was eHAT (i.e. HAT occurring within two months from LT).
Results: Overall, 6% patients developed eHAT. In multivariable analysis, arterial conduit (aHR=2.96), anastomotic redo (aHR=4.15), arterial reconstruction (aHR=2.78), recipient age <45 (aHR=2.35) and a diabetic donor (aHR=2.70) were independently associated with eHAT. In patients with predefined surgical RFs, AP administration significantly reduced eHAT rate (4.2% vs 25.5%, p=0.001) and eHAT-related re-LT (3.5% vs 20.7%, p=0.001). Moreover, AP administration in those with surgical RFs resulted in similar 1-year graft (88.1% vs 87.3%, p=0.87) and patient (91.6% vs 90.7%, p=0.73) survival as patients without any RF. In contrast, those with RFs who did not receive AP showed significantly worse one year graft survival (70.7% vs 88.1%, p<0.001). AP use was not associated with increased bleeding complications (p=0.31).
Conclusions: In conclusion, main RFs for eHAT include surgical factors, donor diabetes and recipient age <45. Implementing antiplatelet prophylaxis in patients with predefined surgical RFs significantly reduced eHAT development and improved graft and patient survival to a level comparable to recipients without any surgical RFs. Future, preferably controlled, studies are needed to confirm our findings.

Natural history of early onset extrahepatic portal vein occlusion after pediatric liver transplantation; results of the PORTAL registry

L. Sieben[1], B.A. Alfares[2 / 3], R.H.J. de Kleine[4], H.J. Verkade[5], R.A.J. Dierckx[6], R.P.H. Bokkers[7], H.P.J. van der Doef[8], PORTAL registry investigators[9], [1]Pediatrics, division of pediatric gastroenterology and hepatology, University Medical Centre Groningen, [2]Dept. of Radiology, University Medical Centre Groningen, Nederland. [3]Dept. of Radiology, King Faisal Specialist Hospital and Research Center, Riyadh, Saoedi-Arabië, [4]Division of Hepatobiliary Surgery & Liver Transplantation, Dept. of Surgery, University Medical Centre Groningen, [5]Division of Pediatric Gastroenterology and Hepatology, Dept. of Pediatrics, University Medical Centre Groningen, [6]Dept. of Nuclear Medicine and Molecular Imaging, Medical Imaging Center, University Medical Centre Groningen, [7]Dept. of radiology, Medical Imaging Center, UMC Groningen, [8]Division of Pediatric Gastroenterology and Hepatology, Dept. of Pediatri, UMC Groningen, Nederland, [9]PORTAL Registry.

Background: In the first year after pediatric liver transplantation (pLT), a notable decline in both graft- and patient survival is observed, which then stabilizes. The potential influence of early onset portal vein obstruction (PVO) on this early decrease is not well understood. Our study aimed to determine the outcome of early onset extrahepatic portal vein occlusion (EHPVO) post-transplantation.
Methods: This is a multicenter observational cohort study involving patients who underwent pLT over a 20-year period across 21 international centers participating in the PORTAL registry. Patients diagnosed with early onset EHPVO (≤14 days after pLT) were included. Graft- and patient survival after diagnosis were determined.
Results: A total of 5921 patients were enrolled to the PORTAL registry, of which 416 developed a portal complication. Among these, 82 experienced an early onset EHPVO. The majority (82%, n=67) received surgical treatment, primarily thrombectomy (58%, n=48) and interposition graft placement (15%, n=12). Graft survival rates at 1 and 5 years were 72% (95%CI 62-81%) and 64% (95%CI 53-75%), respectively. Patient survival rates were 78% (95%CI 69-88%) at 1 year and 74% (95%CI 65-84%) at 5 years.
Conclusions: Early onset EHPVO is a significant complication, in all likelihood negatively affecting both graft- and patient survival after pLT. Future research should focus on developing precise prevention, screening, and treatment strategies for early onset EHPVO to enhance long-term outcomes in pLT.

13C-Methacetin breath test enables assessment of liver function during hypothermic oxygenated machine perfusion

E.H. Küçükerbil[1], I.J. Schurink[1], J.W. Willemse[1], P.C. Groen[1], S.L. Luijmes[1], R. Broere[1], F.J. van der Heijden[1], F.H.C. de Goeij[1], S. Darwish Murad[2], L.J.W. van der Laan[1], W.G. Polak[3], R.J. Porte[3], J. de Jonge[4], [1]Heelkunde, [2]MDL, Erasmus MC Transplant Institute, Rotterdam, [3]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, [4]Surgery, Erasmus MC, Rotterdam, Nederland.

Background: Sequential dual hypothermic oxygenated, controlled oxygenated rewarming and normothermic machine perfusion (DHOPE-COR-NMP) has emerged as a promising technique to test and transplant extended criteria donor (ECD) livers. DHOPE is performed at 10 °C, and is proven to resuscitate grafts before transplantation. However, the low temperature impairs the capability to perform donor liver functional assessment. The ^{13}C-Methacetin Breath Test (^{13}C-MBT) is a clinically validated cytochromal breath test, based on the metabolism of ^{13}C-Methacetin, to assess liver function before and after major liver surgery. We aimed to test and evaluate the prognostic value of ^{13}C-MBT in the assessment of liver function during DHOPE.
Methods:In the test phase, we performed ^{13}C-MBT after 60 minutes of cold perfusion in a porcine model with short warm ischemia (35 minutes; N=4) and prolonged warm ischemia time (75 minutes; N=4). In the evaluation phase, 36 human grafts were evaluated during DHOPE-COR-NMP. Decision to transplant was independent of the ^{13}C-MBT score. Median values are given with their interquartile range.
Results: Porcine livers that were exposed to prolonged warm ischemia scored significantly lower in comparison with the short warm ischemia group (152 [101-217] vs. 401 [346-461] µg/kg/h, p = 0.03). Thirteen human livers were declined during DHOPE-COR-NMP for transplantation based on biliary (N=4; 31%), hepatocellular (N=2; 15%) or combined acceptance criteria (N=7; 54%). The ^{13}C-MBT score ranged for the whole cohort from 21 to 704 µg/kg/h.
Transplanted livers scored significantly higher during the ^{13}C-MBT (332 [241-409] µg/kg/h) compared to non-transplanted livers (255 [80-305] µg/kg/h, p = 0.02).
Conclusions: In conclusion, the ^{13}C-MBT is feasible during DHOPE and the enables the assessment of liver metabolism. This is the first real-time function test to assess ECD donor livers even in the cold, but a clear cut-off level is lacking.

A meta-analysis comparing viability assessment criteria during normothermic machine perfusion and transplant outcomes of DCD and DBD livers

A.M.P. den Dekker[1], A. Franssen[1], J.B. Doppenberg[1], I.P.J. Alwayn[2], [1]LUMC transplant center, Leiden University Medical center, Leiden, [2]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: Utilization rate of liver grafts from donors after circulatory death (DCD) is lower compared to donors after brain death (DBD) likely due to hesitance caused by longer warm ischemia times. It remains unclear whether common viability parameters during normothermic machine perfusion (NMP) deviate between DCD and DBD livers, potentially leading to differences in utilization rate or clinical outcomes after transplantation. Therefore, the aim of this meta-analysis was to compare viability assessment criteria and transplant outcomes of DCD and DBD livers subjected to NMP.
Methods: PubMed, Web of Science, EMBASE, and the Cochrane Library were searched for publications reporting livers placed on NMP, during which metabolic and perfusion parameters are used for viability assessment prior to transplantation. Out of 625 unique articles, 12 were included in this meta-analysis. Effect size (ES) was calculated using Cohen's d and log odds ratio. When I^2 was 0.5 or lower, a fixed effects model was used, otherwise, a random effects model was used to account for heterogeneity.
Results: A total of 382 livers were subjected to NMP, of which 179 DBD and 203 DCD. DBD livers had longer cold ischemia time (ES: 0.51, I^2=0.07, p<0.001), however, there were no significant differences in donor age, BMI, liver weight or machine perfusion duration. Furthermore, the only binary viability assessment criterion which differed was bile production, 83.5% of DBD livers produced bile compared to 70.2% of DCD livers (ES:0.93, I^2=0.36, p=0.004). After viability assessment, DBD livers where transplanted significantly more often than DCD livers, with 81.6% and 71.9% utilization rates, respectively (ES:0.55, I^2=0.29, p=0.03). Post-transplantation, there were no significant differences in clinical outcomes, such as early allograft dysfunction (ES:-0.08, I^2=0.00, p=0.822), non-anastomotic strictures (ES:-0.60, I^2=0.00, p=0.115), one-year death censored graft (ES:0.73, I^2=0.00, p=0.325) and patient survival (ES:-0.10, I^2=0.00, p=0.908).
Conclusions: DBD livers were transplanted more often than DCD livers after NMP, with only small differences in viability assessment criteria and perfusion parameters. Livers from both donor types had very similar post-transplant clinical outcomes. This study suggests that potentially more livers will be accepted for transplantation by using viability assessment during NMP without rejecting grafts due to donor criteria, such as donor type.

The yield of routine post-operative Doppler ultrasound to detect early post-liver transplantation vascular complications

S. Darwish Murad[1], I. Minciuna[1], C. den Hoed [1], A.J. van der Meer[1], M.J. Sonneveld[2], D. Sprengers[1], R.J. de Knegt[1], J. de Jonge[3], R. Maan[1], W.G. Polak[4], [1]MDL, Erasmus MC Transplant Institute, Rotterdam, [2]MDL, Erasmus MC, Rotterdam, [3]Surgery, Erasmus MC, Rotterdam, [4]Heelkunde, Erasmus MC Transplant Institute, Rotterdam, Nederland.

Background: Early detection and timely management of post liver transplantation (LT) vascular complications are of paramount importance as these early complications can lead to fulminant graft failure. Our aim was to assess if routine Doppler ultrasound (rDUS) improves the detection of hepatic artery thrombosis (HAT), portal vein thrombosis (PVT) and hepatic venous outflow obstruction (HVOO).
Methods: This is a retrospective single-centre study of 708 adult patients who underwent primary LT between 2010-2022 and underwent rDUS on post-operative day (POD) 0,1 and 7, followed by Computed Tomography (CT) if indicated. Timing and outcomes of HAT, PVT and HVOO, number needed to diagnose one complication (NND) and positive predictive value (PPV) of rDUS was calculated.
Results: HAT developed in N=50 (7.1%; 68% in first week), PVT in N=58 (8.2%) and HVOO in N=22 (3.1%). Median time to diagnosis was 4 days for HAT, 21 days for HVOO and 47 days for PVT. Most early complications were diagnosed on POD 0 (26.9%), 1 (17.3%) and 5 (17.3%). Of the 26 vascular events on protocol days (0,1,7), 21 (80.7%) were detected by rDUS. PPV of rDUS was 53.8% (21/39), detection rate 1.1% (21/1900 ultrasounds) and NND was 90.5. The vascular events detected by rDUS led to surgical re-intervention in 14 patients (66.7%), while 7 (33.3%) were treated by anticoagulant therapy alone. This approach preserved the graft in 57.1% patients while 28.6% proceeded to urgent re-LT and 14.3% underwent late re-LT.
Conclusions: In conclusion, the majority of post-LT vascular complications occur during first week. rDUS detects the majority of events, but with low PPV and a high number of ultrasounds needed. Implementing a rDUS protocol, preferably at POD 0,1 and 5, leads to timely diagnosis and management. However, a true clinical benefit in terms of graft and patient's survival has yet to be shown.

Late onset hepatic artery stenosis after pediatric liver transplantation: the potential role of conservative management

W. Li[1], R.P.H. Bokkers[1], H.P.J. van der Doef[3], T. Kotsou[1], H. Hartog[2], R. Scheenstra[3], V.E. de Meijer[4], M.W. Stenekes[5], M.V. Verhagen[1], [1]Dept. of radiology, Medical Imaging Center, UMC Groningen, [2]Section of Hepatobiliary Surgery and Liver Transplantation, Dept. of Sur, UMC Groningen, [3]Division of Pediatric Gastroenterology and Hepatology, Dept. of Pediatri, UMC Groningen, [4]Dept. of Surgery, University Medical Center Groningen, [5]Dept. of Plastic and Reconstructive Surgery, UMC Groningen, Nederland.

Background: Managing hepatic artery stenosis (HAS) following pediatric liver transplantation (pLT) is a considerable challenge, primarily due to uncertainties about the most effective treatment type and its necessity. Endovascular revascularization and surgery are suggested as primary treatment, however reports on conservative management are lacking. This study aimed to investigate the outcomes and effectiveness of treatment in patients with late HAS post-pLT.
Methods: This is a single center retrospective cohort study between January 1st, 2004 and August 1st, 2023. Late HAS was defined as HAS occurring more than 14 days after pLT. The primary outcomes were graft and patient survival and biliary complications.
Results: In a cohort of 327 patients (mean age of 5.2 years at pLT), 12 cases of late HAS were identified in 10 patients (mean age of 7.3 years at pLT). During a median follow-up of 27.9 months, patient survival was 100%, and graft survival was 91%. Conservative management was employed in 6 cases of HAS, while endovascular treatment was performed in 6 cases, with a technical success of 80%. Restenosis occurred in 1 patients within 7 months. Both groups showed favorable patient (100%) and graft survival rates (83% for conservative management, 100% for endovascular treatment). Graft loss occurred as a result of biliary complications, which were identified prior to the diagnosis of HAS.
Conclusions: This study shows that late-onset HAS has a favorable outcome. Endovascular therapy has a high technical success, although conservative treatment may also be an option. Further research for identifying risk factors for poor outcomes may help triage patients for therapy.

Islet function loss following total pancreatectomy and islet autotransplantation (TPIAT)

M.C. Tol[1], M.A. Engelse[1], F. Carlotti[1], V.A.L. Huurman[2], E.J.P. de Koning[1], [1]Interne Geneeskunde, Leids Universitair Medisch Centrum, Leiden, [2]Chirurgie, Leids Universitair Medisch Centrum, Leiden, Nederland..

Background: TPIAT is a last resort treatment to alleviate pain, improve quality of life and (partially) preserve pancreatic endocrine function for patients with chronic pancreatitis. A significant number of islets is lost during isolation and transplantation. The goal of this study was to compare the islet secretion capacity before and after TPIAT.
Methods: A multidisciplinary team assessed eligibility for TPIAT. The islet isolation took place in a Good Manufacturing Facility (GMP). The islets were infused into the portal vein after percutaneous transhepatic catheterization. A two-hour mixed meal tolerance test (MMTT) was administered at baseline, 3 months and 1 year postoperatively to assess beta cell function.
Results: Of 21 consecutive TPIAT patients, fifteen had data available at baseline and 3 months and were included in this analysis. All patients underwent TPIAT for chronic pancreatitis. The mean age was 42.1 ± 11.7 years and 13 patients were female. Mean BMI decreased from 24.5 ± 4.8 at baseline to 22.9 ± 4.5 kg/m^2 after three months ($p<0.001$). Patients received a median (IQR) of 3464 (2800-4648) islet equivalents per kilogram bodyweight. Area under the curve (AUC) C-peptide during MMTT decreased from 175.6 ± 85.8 at baseline to 77.3 ± 49.2 at 3 months ($p<0.001$). AUC C-peptide/AUC glucose ratio was reduced from 0.21 ± 0.11 at baseline to 0.06 ± 0.05 at 3 months ($p<0.001$). For those patients with 1 year data, AUC C-peptide was similar at 3 months to 1 year (83.4 ± 51.3 vs 80.1 ± 62.0, $p=0.76$, N=13). Of 12 patients who were insulin independent at baseline, 2 remained insulin independent at 3 months after TPIAT.
Conclusions: TPIAT leads to more than 50% loss in islet secretory capacity. No further reduction in islet mass is observed up to 1 year.

Clinical translation and implementation of a bio-artificial pancreas: a qualitative study exploring the perspectives of people with type 1 diabetes

D. de Jongh[1], E.M. Bunnik[2], E.K. Massey[3], [1]Erasmus MC Transplant Institute, Dept. of Internal Medicine,, Erasmus Medical Center, Rotterdam, [2]Dept. of Medical Ethics, Philosophy and History of Medicine, Erasmus Medical Center, Rotterdam, [3]Erasmus MC Transplant Institute, Dept of Internal Medicine, Erasmus MC, Rotterdam, Nederland.

Background: In the field of regenerative medicine, researchers are developing a hybrid beta-cell replacement approach to treat type 1 diabetes, referred to as the '*bioartificial pancreas*' (BAP). While this potential therapy shows promise, research participants enrolled in early-phase transplantation trials will be inevitably exposed to risks and patient perceptions are likely to influence uptake and success of implementation. In this interview study, the perspectives of people with type 1 diabetes regarding the BAP as alternative treatment were evaluated in order to identify and understand their expectations, needs and concerns, and factors they would consider when deciding to undergo BAP transplantation.
Methods: Semi-structured interviews were carried out among 24 individuals with type 1 diabetes. Inclusion was stopped once data saturation was reached. Interviews were audio-taped and transcribed verbatim. The interviews were independently analyzed by two researchers. A qualitative content analysis with an inductive approach was conducted to develop themes within a coding framework.
Results: Participants reported many hoped-for benefits of the BAP compared to their current treatment which were not only in the medical domain but also in the psychological and social domain. Medical hoped-for benefits were improved diabetes-related clinical outcomes. Psychological hoped-for benefits were more headspace, emotional relief, and better protection of privacy. Social hoped-for benefits were improved flexibility in daily life, relationships with others, and the disease becoming less visible to others, thus avoiding stigmatization and increasing opportunity for participation in society. Additionally, medical concerns included the BAP requiring an invasive, irreversible surgical procedure. Psychological concerns were loss of control of their disease and/or treatment. Societal concerns were equitable accessibility of the therapy. Factors participants would consider when deciding to undergo treatment with a BAP included functionality and safety, trust, the biological materials used, the location of the BAP in the body, and intrusiveness of follow-up care.
Conclusions: Incorporating insights from this study in the clinical development and implementation of the BAP will help align the product and procedures with the needs of people with type 1 diabetes. Greater alignment is likely to contribute to responsible uptake and adoption.

The association between immunophenotype and the immune response following COVID-19 vaccination in kidney transplant recipients

C. Imhof[1], J.A.J. Rolwes[2], A.L. Messchendorp[1], J.S.F. Sanders[3], D. van Baarle[2], M. van der Heiden[2], [1]Nefrologie, UMCG, Groningen, [2]Medische microbiologie, UMCG, Groningen, [3]Nefrologie, UMC Groningen, Nederland.

Background: Kidney transplant recipients (KTR) elicit an inferior immune response following COVID-19 vaccination, mainly due to the use of immunosuppressive agents. However, inter-individual differences in immune response after vaccination exist in patients with equal immunosuppressive regimens and similar transplant characteristics. This suggests other factors could influence the immune response, such as the composition of the immune system at the moment of vaccination. Therefore, we investigated the association between the baseline immunophenotype and COVID-19 vaccination response.
Methods: For this study, we used peripheral blood mononuclear cells (PBMCS), isolated prior to vaccination, from 60 KTR. These KTR were classified into responders (both antibody and T-cell response, n=16), antibody responder (only an antibody response, n=14), T-cell responder (only a T-cell response, n=15), or complete non-responder (n=15) after the second mRNA-1273 vaccination. The immunophenotype was extensively characterized using flow cytometry.
Results: Non-responders (0.02% (0.01-0.04)) had significantly lower frequencies of plasmablasts compared to antibody responders (0.10% (0.04-0.14; p=0.013) and responders (0.08% (0.03-0.12); p=0.037), whereas follicular T helper cells were lower in non-responders (0.10% (0.05-0.23)) compared to T-cell responders (0.44% (0.15-1.32); p=0.0075) and responders (0.35% (0.10-0.72); p=0.045). Additionally, preliminary analysis suggests a higher frequency of $CD4^+$ T-cells expressing a combination of the exhaustion markers TIGIT+Lag3+ (p=0.004) and PD1+Lag3+ (p<0.001) as well as PD1+Lag3+ on $CD8^+$ T cells (p=0.007) in non-responders compared to responders.
Conclusions: KTR who are complete non-responders show several significant differences in their pre-vaccination immune phenotype compared to responders, which may also explain inter-individual differences in the immune response to COVID-19 vaccination besides using immunosuppressive agents. Further analyses will focus on unbiased gating to unravel different immunophenotypes. Future vaccines may then be developed or existing vaccines adapted, specifically for these different immunophenotypes, in order to elicit an optimal immune response and provide protection against disease in these patients.

Cross-reactivity of SARS-CoV2 vaccination-induced T cells with allogeneic HLA

G.E. Karahan[1], E. Meer-Prins[1], J. Anholts[1], I. Gille[1], N. Mulling[1], R. Arens[1], S. Heidt[2], [1]Immunology, Leiden University Medical Center, Leiden, [2]Immunologie, LUMC, Leiden, Nederland.

Background: Direct T cell reactivity against non-self HLA can occur as a result of cross-reactivity of self-restricted virus-specific T cells, known as heterologous immunity. Cross-reactivity of naturally acquired virus-specific T cells with alloantigens has been shown to be common, whereas data on cross-reactivity of vaccination-induced T cells with allogenic HLA remain to be scarce. Induction of T cell-mediated heterologous immune responses to alloantigens in the setting of solid organ transplantation can potentially lead to allograft rejection. In this study, we aimed to explore whether SARS-CoV2 vaccine induced T cells can cross-react with allogenic HLA.
Methods: We obtained peripheral blood mononuclear cells of an HLA-A2$^+$ healthy individual collected 18 days after a first vaccination with a SARS-CoV2 vector vaccine (Janssen). CD8+ T cell lines were generated by FACS sorting using HLA-A*02:01 tetramers containing the SARS-CoV2/YLQPRTFLL peptide. HLA-A*02:01 restricted SARS-CoV2/YLQPRTFLL-specific T cell lines (n=10) were tested against a panel of HLA-typed cells (n=30) and cross-reactivity with allogeneic HLA was measured through IFN-γ secretion and cytotoxicity assays. T cell receptor (TCR) usage of the cell lines was determined by DNA sequencing using Vβ region-specific primers.
Results: All cell lines recognized HLA-A*02:01$^+$ target cells loaded with the YLQPRTFLL peptide without background IFN-g production. Two out of 10 cell lines produced IFN-γ upon coculture with a panel of 20 different HLA-typed B cell lines. Line 13A1 reacted against 2 target cells having HLA-A*01:01 expression in common, whereas line 13A12 reacted against a combination of HLA-A*11:01/29*02/B*35:01/44*03/C*04:01/06:02/16:01 expressed on 7 different target cells. Cell line 13A1 expressed a single TCRVβ (TRBV20-1*01/02) and cross-reactivity of 13A1 with HLA-A*01:01 was confirmed by IFN-γ production against a second panel of 10 different B cell lines expressing HLA-A*01:01. Cytotoxicity assay revealed that SARS-CoV2/YLQ-specific T cell line 13A1 was also cytolytic against cells expressing homozygous HLA-A*01:01. Line 13A12 expressed multiple TCRVβ gene segments indicating the necessity of cloning for further analysis.
Conclusions: Our preliminary data indicate that SARS-CoV2-specific T cells can cross-react with allogeneic HLA, resulting in lysis of allogeneic cells. The clinical relevance of vaccination-induced T cells that cross-react with allogenic HLA remains to be unraveled.

Influence of cellular immunity against Cytomegalovirus on the presence of active infections after solid organ transplantation

F.M. Verduyn Lunel, Medische Microbiologie, UMC Utrecht, Nederland.

Background: Cytomegalovirus (CMV) is one of the most important pathogens after solid organ transplantation (SOT), for which cellular mediated immunity (CMI) is the mainstay of control of these infections. Strategies to control these infections include antiviral prophylaxis after transplantation, in case of mismatch between donor and recipient serostatus, or close monitoring for cmv viral load in blood in order to be able to start preemptive antiviral therapy. However antiviral therapy is hampered by side effects and resistance against antivirals. Previously published research showed that presence of CMI results in decreased number of active infections, reduced incidence of CMV disease and a decreased need for antiviral therapy. Here we describe experience with assay used for testing cellular immunity against CMV.
Methods: We performed a retrospective analysis of the influence of CMIA assay results on the viral load of CMV in plasma. We calculated the Area under the Curve (AUC) for each patient.
Results: Results of 417 CMI measurements were available in 174 unique patients, including kidney-, heart-, and lungtransplantation in the period 2014-2022. Four categories of results were observed, namely negative CMI (ie no sign of CMI) in 45 patients with a single measurement, 20 patients without development of CMI in follow-up measurements, 20 patients with development of CMI in follow-up measurements, and 89 patients with a positive CMI in the first measurement. Calculated AUC were 439.8 in the single measurement, 1258.0 in the category without development of CMI, 1699.4 in the category with development of CMI, and 672.0 in the category with initially positive CMI. Observed AUC results differed significantly between patients with initially positive CMI and patients who were initially negative and both failed to develop CMI or showed development of CMI in follow-up testing ($p<0.05$).
Conclusions: A positive cellular mediated immunity assay indicating presence of CMI against CMV results in reduction of active CMV infections after SOT.

Adverse outcomes after different lymphocyte-depleting therapies for T cell-mediated kidney transplant rejection

L.K. van Vugt[1,2], E. Tegzess[3], M. van der Zwan[4], B. de Winter[5], M.C. Clahsen-van Groningen[6], M.E.J. Reinders[7], J.S.F. Sanders[8], S.P. Berger[9], D.A. Hesselink[7], [1]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [2]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC Transplant Institute, Rotterdam, [3]Dept. of Internal Medicine, Division of Nephrology, UMCG, Groningen, [4]Dept. of Internal Medicine, A Schweitzer Hospital Dordrecht, Dordrecht, [5]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [6]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Nefrologie, UMC Groningen, [9]Interne geneeskunde, Nefrologie, UMC Groningen, Nederland.

Background: Lymphocyte-depleting therapy is recommended for severe or glucocorticoid-resistant T cell-mediated kidney transplant rejection (TCMR). The registered lymphocyte-depleting therapy for TCMR is anti-thymocyte globulin (ATG). Alemtuzumab can be used as alternative lymphocyte-depleting therapy. It has an easier mode of administration and has less infusion-related reactions. However, alemtuzumab has been associated with an increased mortality risk and high infectious burden. It is currently not known how these risks relate to the risks of ATG therapy. Therefore, mortality and the occurrence of serious infections after alemtuzumab and ATG were compared.
Methods: Overall patient mortality and serious infection-free survival of kidney transplant recipients treated with alemtuzumab or ATG for biopsy-proven TCMR were compared between two different transplant centers. Patients were included between January 1st 2012 and January 1st 2022. Serious infections were defined as hospital-acquired infections or infections that required hospital admission. Patient survival and infection-free survival were computed using Kaplan-Meier survival curves and compared with the log-rank test. With multivariable, Cox proportional hazard models, hazard ratio's (HR) were calculated for both therapies whilst correcting for baseline variables.
Results: 130 alemtuzumab-treated and 53 ATG-treated patients were included. Baseline characteristics were not significantly different between the two groups. Patient survival and serious-infection free survival were comparable and did not differ significantly (p=0.7 and p=0.5 respectively). Patient survival at five years after therapy was 72.1% for alemtuzumab-treated patients and 74.4% for ATG-treated patients (ns). Median infection-free survival was 370 days for alemtuzumab and 356 for ATG (ns). In multivariable analysis, ATG versus alemtuzumab treatment was not associated with an increased risk of mortality (HR 1.02, 95%-CI 0.58-1.77) or serious infections (HR 0.79, 95%-CI 0.52 to 1.19).
Conclusions: Treatment of TCMR with alemtuzumab is not associated with an increased mortality or increased risk of serious infections compared to ATG. These results suggest that alemtuzumab is a safe alternative to ATG for the treatment of severe and glucocorticoid-resistant kidney transplant rejection.

Conversion to belatacept in kidney transplantation: the Rotterdam experience

G.N. de Graav[1], J.I. Roodnat[1], D.A. Hesselink[2], [1]Nefrologie, Erasmus MC, Rotterdam, [2]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, Nederland.

Background: After kidney transplantation, belatacept, a costimulation blocker, is an alternative immunosuppressive agent for tacrolimus, a calcineurin inhibitor (CNI). It has a favourable cardiovascular profile, but a higher acute rejection rate early after transplantation compared to a CNI-based regimen. We share our experience of converting kidney transplant patients from a CNI-based to a belatacept-based immunosuppressive regimen, and give recommendations for general clinical practice.
Methods: All kidney transplant patients who were or had been on belatacept in our center after 2012 were included for analysis. Patient and transplant characteristics; reason for and method of conversion were studied; as well as rejection rate after conversion from CNI to belatacept. Finally, trends in estimated glomerular filtration rates (eGFR) before and after conversion to belatacept, were analyzed.
Results: Patients converted to belatacept (n=19) had a low immunological risk for rejection: 63% living donors, median calculated panel reactive antibody (cPRA) was 0%, and 75% received their first kidney. Median time between transplantation and conversion was almost 3 years. Most prevalent reasons for conversion were renal in nature (n=12), i.e. interstitial fibrosis and tubular atrophy (IFTA: 26%); thrombotic microangiopathy (TMA: 26%); and acute tubular necrosis (ATN: 11%). The majority of these patients showed a decline in eGFR before conversion to belatacept (67%). However, after conversion, most of these patients (89%) had a stable or improving eGFR in the long term. This positive effect of belatacept was not seen in patients who were converted for non-renal causes (n=7). Six of these patients had a stable or increasing eGFR before conversion, of which after conversion, 3 had a decline in eGFR, and 3 had a stable or increasing eGFR. One patient, converted for non-renal causes, had a declining eGFR before and after conversion. In total, 7 of 19 patients had a biopsy proven acute rejection (BPAR) after transplantation, of which 4 were after conversion to belatacept. Of these 4 patients, 3 were converted within the first 3 months after transplantation, one of them was converted for renal cause. Moreover, in these patients, CNI was stopped immediately after start belatacept, without tapering down the dosage. The 4 patients with a BPAR after conversion, all showed a decline in eGFR in the long term.
Conclusions: Conversion of a CNI-based to a belatacept-based regimen can be beneficial and safe in kidney transplant patients experiencing CNI-toxicity. The risk for acute rejection is smaller when conversion is not shortly after transplantation and when a period of overlap of CNI and belatacept is applied.

The tacrolimus concentration-to-dose ratio correlates to kidney function after heart transplantation

M.R. Schagen[1 / 2], T.B. Petersen[3 / 4], B.C.A. Seijkens[5], J.J. Brugts[6], K. Caliskan[6], A.A. Constantinescu[6], B. de Winter[7], I. Kardys[3 / 4], D.A. Hesselink[8], O.C. Manintveld[9], [1]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [2]Internal Medicine, Division of Nephrology and Transplantation, Rotterdam Clinical Pharmacometrics Group, Rotterdam, [3]Biostatistics, Erasmus MC, Rotterdam,[4]Biostatistics, Erasmus MC Cardiovascular Institute, Rotterdam, [5]Hospital Pharmacy, Erasmus MC, Rotterdam,[6]Cardiology, Erasmus MC, University Medical Center, Rotterdam, [7]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [8]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam[9]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Rotterdam, Nederland.

Background: The tacrolimus (Tac) metabolic rate (defined as the concentration-to-dose ratio (C/D-ratio)), is linked to decreased kidney function, Tac-induced nephrotoxicity, and decreased death-censored kidney allograft-survival, in both kidney and liver transplant recipients. End-stage kidney disease (ESKD) complicates heart transplantation (HT) in as much as 20%, and Tac-related nephrotoxicity is considered an important cause. Therefore, the association between the Tac C/D-ratio and kidney function after HT was investigated.
Methods: This was a retrospective study that included 209 HT-recipients (transplanted between 2000-2022), who received Tac twice-daily as initial immunosuppression for at least six months after HT. Data was collected at 3, 6, 12, 36, and 60 months post-HT. Patients were categorized into four groups based on the distribution of the quartiles of their mean C/D-ratio. A linear mixed-effects model analysis was performed to assess the influence of the Tac metabolic rate on time-varying kidney function (eGFR). The association of the four groups and all-cause mortality was assessed using the Kaplan-Meier method.
Results: The overall median C/D-ratio was 1.90 ng/mL/mg (IQR 1.27-2.46). The eGFR was significantly different between the four groups at all five time points, with an overall median eGFR in group 1 (fastest Tac metabolism) of 50 mL/min/1.73 m^2 (95%-CI 40-62), compared to 67 mL/min/1.73 m^2 (95%-CI 51-78) in group 4 (slowest Tac metabolism; p <0.001). In the multivariate time-varying model, group 1 had a lower eGFR compared to the other groups (p <0.05), even when adjusted for significant confounders (time after HT, age and sex of recipient, CVVH immediately after HT, creatinine before HT, time-varying Tac concentration (p <0.001)), and physiologically relevant confounders (BMI of recipient, etiology of heart failure, use of mechanical heart support pre-HT, peri-operative ischemic time, diabetes mellitus, hypertension (NS)). Finally, the five-year survival probability for group 1 was 94% compared to 88% for group 4, but no difference in survival rate between the four groups was identified (p = 0.25).
Conclusions: A fast Tac metabolism, defined by a C/D-ratio ≤1.27 ng/mL/mg, was associated with poorer kidney function. This observation is possibly explained by Tac peak-related toxicity which arises when underexposure is countered by increasing the Tac dose. ESKD after HT may be ameliorated by either targeting lower Tac exposure or to switch to an extended-release Tac formulation with concomitant lower peak concentrations.

Prediction of the intra-T lymphocyte tacrolimus concentration after kidney transplantation with population pharmacokinetic modelling

M.R. Schagen[1,2], S. Udomkarnjananun[3,4], H. Volarevic[5,6], D. van de Velde[5], M. Dieterich[1], M. Matic[7], C.C.B. Baan[8], M.E.J. Reinders[9], B. de Winter[10], D.A. Hesselink[9], [1]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [2]Internal Medicine, Division of Nephrology and Transplantation, Rotterdam Clinical Pharmacometrics Group, Rotterdam, Nederland, [3]Division of Nephrology, Dept. of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Bangkok, Thailand, [4]Division of Nephrology, Dept. of Medicine, Erasmus MC Transplant Institute, Rotterdam, [5]Hospital Pharmacy, Erasmus MC, Rotterdam, [6]Hospital Pharmacy, Rotterdam Clinical Pharmacometrics Group, Rotterdam, [7]Clinical Chemistry, Erasmus MC, Rotterdam, [8]Internal Medicine, Erasmus Medical Center, Rotterdam, [9]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [10]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, Nederland.

Background: The tacrolimus whole-blood (WB), pre-dose concentration (C_0) is routinely measured after kidney transplantation to perform therapeutic drug monitoring. However, the WB C_0 has a poor correlation with clinical events. Since tacrolimus' site of action is within immune cells, the intra-T lymphocytic tacrolimus concentration (IC) in $CD3^+$ T lymphocytes might better represent the active tacrolimus concentration. However, this analytical method is complex, time-consuming and labour-intensive. Therefore, the primary aim of this study was to develop a population pharmacokinetic (popPK) model to predict the IC tacrolimus concentration from WB concentrations.
Methods: Twenty-eight *de novo* kidney transplant recipients, treated with an extended-release tacrolimus formulation (LCP-Tac), were prospectively followed during the first month post-transplantation. All available tacrolimus WB C_0 were included. The IC tacrolimus concentration was measured at day 6±1 (C_0, 4 and 8 hours post-dose), and day 14±3 (C_0) post-transplantation. PopPK analysis was performed using non-linear mixed effects modelling based on 248 WB and 109 IC tacrolimus concentrations.
Results: Five patients were diagnosed with acute allograft rejection (18%), another five developed post-transplant diabetes mellitus (18%). The median tacrolimus WB C_0 during the first month post-transplantation was 9.1 ng/mL (IQR 6.5-11.8), and the median tacrolimus IC C_0 was 19 pg/million cells (IQR 11.25-38.5). The correlation between the WB and IC concentrations was moderate, albeit significant (Spearman rank correlation test: p = 0.01, *rho* = 0.48). The ratio from WB to IC concentrations was best described by a two-compartment model with an additional IC compartment without mass transfer ($R_{WB:IC}$ = 2420). The $R_{WB:IC}$ remained stable during the first two weeks post-transplantation. Prednisolone dose (delta objective function value (ΔOFV) -15.9) and *ABCB1* (ΔOFV = -9.4) were correlated with the absorption rate of LCP-Tac (p <0.01). Hemoglobin (ΔOFV = -9.7), *CYP3A4*22* allele carrier (ΔOFV = -11.5), and *CYP3A5* expresser status (ΔOFV = -10.9) were correlated with the oral clearance of LCP-Tac (p <0.01).
Conclusions: The IC tacrolimus concentration can be predicted from WB concentrations using this popPK model, without the need for repeated IC tacrolimus concentration measurements. This may greatly facilitate clinical care settings where measuring IC tacrolimus concentration remains complex.

Pharmacokinetics of tacrolimus in pregnant solid organ transplant recipients: a retrospective study

P. Mian[1], J. Versluis[1], P. Mian[5], A.R. Bourgonje[2], J.R. Prins[3], D.J. Touw[1], J.R. Meinderts[4], M.F.C. de Jong[4], [1]Clinical Pharmacy and Pharmacology, UMC Groningen, [2]Gastroenterology, UMC Groningen, [3]Obstetrie en Gynaecologie, UMC Groningen, [4]Interne Geneeskunde, onderafdeling Nefrologie, UMC Groningen, Nederland,[5]Clinical Pharmacy and Pharmacology.

Background: Data on pharmacokinetics of tacrolimus during pregnancy is limited. Therefore, the aim of this retrospective study was to characterize the whole blood pharmacokinetics of tacrolimus throughout pregnancy.
Methods: In this single-center retrospective cohort study whole blood tacrolimus trough concentrations (corrected for the dose; C/D ratios) were compared before, monthly during and after pregnancy in kidney, liver, and lung transplant recipients who became pregnant and gave birth between 2000 and 2022. Descriptive statistics and linear mixed models were used to characterize changes in tacrolimus C/D ratios before, during and after pregnancy.
Results: The total study population included 46 pregnancies (31 pregnant women). 19, 21, and 6 pregnancies were after kidney, liver and lung transplantation respectively. Immediate release or extended release formulation were used in 54.5% and 45.5% of the women, respectively. Tacrolimus C/D ratios significantly (P<0.001) decreased (-48%) compared to pre-pregnancy state at seven months pregnancy. These ratios recovered within 3 months postpartum (P=0.002). C/D ratios tended to be lower during treatment with an extended release formulation than with an immediate release formulation (P=0.071). Transplantation type did not significantly affect C/D ratios during pregnancy (P=0.873).
Conclusions: In conclusion, we found that tacrolimus whole blood pharmacokinetics change throughout pregnancy, with the lowest C/D ratios (-48% decrease) in the seventh month of pregnancy. In general, the decrease in C/D ratios seems to stabilize from month 4 onwards compared to pre-pregnancy.

Outcomes of kidney transplantation in people with HIV compared to HIV-negative recipients

S. Amen[1], T. Mudrikova[2], A.D. van Zuilen[1], [1]Nefrologie, UMC Utrecht, [2]Infectieziekten, UMC Utrecht, Nederland.

Background: Since the implementation of combination antiretroviral therapy the prognosis of people living with human immunodeficiency virus (HIV) drastically improved. HIV infection is therefore no longer a contra-indication for organ transplantation. We evaluated the post-transplant course of all HIV+ recipients who underwent kidney transplantation in our centre and compared outcomes with the HIV-negative patients transplanted in the same period.
Methods: We conducted a retrospective cohort study. All patients received their transplantation in the UMC Utrecht in the period 2004 through 2023. . Demographical data and data on rejection, graft function, graft- and patient survival was derived from the Dutch Organ Transplantation Registry (NOTR). Information on possible HIV related complications was derived from the hospital electronic health records.
In the analysis of malignancies the development of cutaneous basal cell or squamous cell carcinoma was excluded from our analysis.
Results: A total of 1325 HIV- and 11 HIV+ patients have been transplanted from 2004 to 2023 and included in this analysis. HIV+ patients were of similar age and gender distribution. Only one HIV+ patient had a living donor (9% vs 54% (p=0.008)). HIV+ patients had a markedly longer cold ischemic time (955 ± 393 vs 651 ± 504 minutes; p= 0.01), also they had more dialysis days prior to transplantation (1795 ± 1158 vs 670 ± 708 ; p=0.001).
Patient survival was comparable between the groups (13.3 (9.2-17.5) vs 14.3 (13.8 -14.8) years; p=0.860) as was graft survival (12.5 (8.6-16.4) vs 12.3 (11.8-12.8) years p=0.716). The incidence of first rejection was significantly higher in the HIV+ group (44 % vs 18% in the first year after transplantation; p= 0.01).
Bothe mean GFR and proteinuria were worse in the HIV+ recipients on any timepoint. There was however no difference in the slope of GFR decline in both groups.
In the HIV+ patients CD4 count dropped in the first 3 months after transplantation but returned to pretransplant levels afterwards. Some patients (n=3) had measurable HIV copies at some point after transplantation. This could be attributed to non-adherence to their antiretroviral therapy in all cases.
3 of 11 HIV+ developed a malignancy after transplantation 1 Colon and 2 Kaposi Sarcoma (both staged: T0, I0, S0).
Conclusions: Despite a higher occurrence of transplant rejection and a worse GFR, HIV+ patients receiving a kidney transplantation have similar graft and patient survival. Besides two occurrences of limited Kaposi sarcoma no additional HIV-associated problems occurred which could be attributed to the presence of a kidney transplant and the use of immunosuppressive drugs.

Smoking, alcohol intake and Torque Teno Virus in stable kidney transplant recipients

C.S.E. Doorenbos[1], J. Jonker[2], J. Hao[3], E.J. Gore[4], D. Kremer[5], T.J. Knobbe[6], A.A.E. de Joode[1], J.S.F. Sanders[1], O. Thaunat[7], H.G.M. Niesters[4], C. van Leer-Buter[4], S.J.L. Bakker[8], [1]Nefrologie, UMC Groningen, [2]Nefrologie, UMCG, Groningen, [3]Epidemiologie, UMC Groningen, [4]Medische microbiologie, UMCG, Groningen, [5]Interne Geneeskunde, Nefrologie, UMC Groningen, [6]Interne geneeskunde, Nefrologie, UMC Groningen, Nederland,[7]Nefrologie, Hospices Civils de Lyon, Lyon, Frankrijk, [8]Interne Geneeskunde, UMC Groningen, Nederland.

Background: Torque Teno Virus (TTV) is a non-pathogenic virus that is highly prevalent among both healthy individuals and kidney transplant recipients (KTR). Its circulating load is associated with the immunological status in KTR and is considered a promising tool for guiding immunosuppression. To allow for optimal guidance, it is important to identify other determinants of TTV load. We investigated the potential association of smoking and alcohol intake with TTV load among KTR.
Methods: For this cross-sectional study, serum TTV load was measured using PCR in stable KTR at ≥ 1 year after transplantation. Smoking status and alcohol intake were assessed through questionnaires and measurements of urinary cotinine and ethyl glucuronide, respectively.
Results: A total of 666 KTR were included (57% male). 549 KTR (82%) had a detectable TTV load (3.1±1.5 log10 copies/mL). In KTR with a detectable TTV load, cyclosporin and tacrolimus use were positively associated with TTV load (St.β=0.46, P<0.001 and St.β=0.66, P<0.001 respectively), independently of adjustment for potential confounders. Current smoking and alcohol intake of >20 g/day were negatively associated with TTV load (St.β=-0.40, P=0.004 and St.β=-0.33, P=0.009 respectively), independently of each other and of adjustment for age, sex, kidney function, time since transplantation and calcineurin inhibitor use.
Conclusions: Smoking and alcohol intake are strongly and independently associated with a lower TTV load among KTR. These associations suggest to account for smoking status and alcohol intake when applying TTV-guided immunosuppression in KTR.

Beyond kidney donation: unveiling predictors of long-term kidney function in living donors

M. Laging[1], T. Royaards[1], P.M. Miranda Afonso[2], J. van de Wetering[3], A.E. de Weerd[4], M.E.J. Reinders[3], R.C. Minnee[5], J.I. Roodnat[6], M.L. Kho[7], [1]Interne Geneeskunde, Erasmus MC, Rotterdam, [2]Biostatistiek, Erasmus MC, Rotterdam, [3]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [4]Dept. of Internal Medicine, Transplantation Institute, Erasmus Medical Center, Rotterdam, [5]Dept. of Surgery, Erasmus MC Transplant Institute, Rotterdam, [6]Nefrologie, Erasmus MC, Rotterdam, [7]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, Nederland.

Background: Living donor kidney transplantation yields the best outcomes for patients with kidney failure. There is a need to evaluate the impact of pre-donation characteristics on long-term living donor kidney function (LDKF). This study aims to 1) identify characteristics influencing longitudinal LDKF, 2) construct a prediction model to forecast LDKF in prospective donors (after validation in the Dutch donor population and comparing LDKF trajectories to matched general populations), and 3) incorporate the model in a web app. We present the first results from phase 1 of the study.
Methods: All living donors who donated their kidney between 1981 and 2019 in our center were included. The dataset was compiled from our center's database, the Dutch Organ Transplantation Registry (NOTR) database, and the electronic hospital information system. The evolution of estimated glomerular filtration rate (eGFR) post-donation was investigated using linear mixed-effects models. Pre-donation characteristics, detailed in the results, were included as covariates.
Results: In total 2,212 donors underwent donor nephrectomy. Among them, 2,181 donors had at least one post-donation eGFR measurement available, contributing to 19,109 observations between March 31, 1982 to July 23, 2023. The median number of eGFR measurements per individual was 7 (interquartile range [IQR] 5–12), with corresponding median follow-up times of 8.7 (IQR 4.97–13.4) years. Median pre-donation eGFR was 93 (IQR 82.7–103.9) ml/min/1.73m^2. At donation, median age was 51 (IQR 41–60) years, median BMI 26.3 (IQR 23.8–29.3), and systolic and diastolic blood pressure 129 (IQR 120–139) and 78 (IQR 73.5–85) mmHg, respectively. Fifty percent of donations took place between 2005 and 2014; 56.58% were female; 45.99% were genetically related to the recipient; and 83.29% were Caucasian. Prior to donation, 3.74% had a malignancy; 8.44% experienced some kind of cardiovascular disease; 13.28% had urological conditions; 17.07% used antihypertensive medication; 1.89% had impaired glucose tolerance; and 57.74% had smoking habits. In univariable analysis, all covariates except sex had a significant influence ($p<0.05$) on eGFR evolution after donation.
Conclusions: Our current results reveal associations between pre-donation characteristics and post-donation eGFR evolution. These results offer encouragement to develop a prediction model to enhance individualized understanding of long-term kidney function following donation.

Dynamic release of kidney-derived urinary extracellular vesicles post-transplantation

L. Wu[1,2], W. Xu[3], D. Reijerkerk[3], D.A. Hesselink[4], C.C.B. Baan[5], K. Boer[6], [1]Dept. of Nephrology, The First Affiliated Hospital of Shaoyang University, Shaoyang, China, [2]Dept. of Nephrology, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [3]Dept. of Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, [6]Internal Medicine, Transplant Institute, Erasmus MC, Rotterdam, Nederland.

Background: Kidney transplantation is the preferred treatment for patients with end-stage renal disease (ESRD). The conventional method for diagnosing post-transplant rejection, a renal biopsy, is invasive and restricted due to bleeding and infection risks. Novel, preferably non-invasive markers are needed to indicate allograft status, including rejection. Urinary extracellular vesicles (uEVs) are promising candidates, but the dynamics of uEV release from transplanted kidneys are poorly known. This study investigates the presence of kidney-derived uEVs at various time points post-transplantation.
Methods: Urine was collected from 45 donor-recipient pairs before transplantation and from recipients on day 3 (D3), day 7 (D7), and month 6 (M6) post-transplant. The collected urine was centrifuged to remove cells, and uEVs were stained with the EV-marker CD63 individually or a combination of CD63 with a kidney-specific marker, aquaporin 2 (AQP2; collecting duct), or podocalyxin (PODXL; podocytes) without uEV isolation. uEVs were quantified using imaging flow cytometry with detergent treatment and isotype staining as controls.
Results: Of the CD63+ uEVs from donor urine, 4.2 [0.5 – 14.8]% were AQP2+, and 6.4 [1.5 – 14.2]% were PODXL+. Positive correlations were observed between kidney function (estimated glomerular filtration rate) and these kidney-derived uEV percentages, representing $R^2 = 0.15$ ($p = 0.075$; AQP2+) and $R^2 = 0.20$ ($p = 0.039$; PODXL+). Compared with donor urine, pre-transplant recipient urine displayed minimal levels of kidney-derived uEVs, with 1.3 [0.4 – 2.6]% ($p = 0.14$; CD63+AQP2+) and 1.5 [0.9 – 3.9]% ($p = 0.04$; CD63+PODXL+). These recipient levels remained unchanged on D3 post-transplant (both $p > 0.70$) but significantly increased on D7 to 8.4 [3.9 – 18.4]% ($p < 0.001$; CD63+AQP2+) and 8.2 [3.1 – 15.4]% ($p < 0.001$; CD63+PODXL+) which persisted until M6.
Conclusions: Before kidney transplantation, ESRD patients exhibit lower kidney-derived uEV proportions compared to healthy donors. After transplantation, kidney allografts do not demonstrate immediate uEV recovery on D3, but from D7 onwards, kidney-specific uEVs are released. The dynamic release of kidney-specific uEVs might suggest their potential as markers for assessing allograft status, including delayed allograft function and rejection.

Simultaneous pancreas kidney recipients have a lower tacrolimus exposure for a similar c0 as compared to kidney only recipients

A. Gelinck[1], S. Meziyerh[1], M. Lyousoufi[2], T. van Gelder[3], J. Kamp[4], A.P.J. de Vries[5], D.J.A.R. Moes[6], [1]Nierziekten, LUMC, Leiden, [2]Klinische Farmacie en Toxicologie, LUMC, Leiden, [3]Klinische Farmacie & Toxicologie, LUMC, Leiden, [4]Anaesthesiology, LUMC, Leiden, [5]Nierziekten, Leids Universitair Medisch Centrum, Leiden, [6]Klinische Farmacie en Toxicologie, Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: Current guidelines recommend similar target trough levels (C0) for Simultaneous Pancreas Kidney Transplant recipients (SPKTR) and kidney transplant recipients (KTR). Thus, the assumption is made that SPKTR and KTR achieve a similar area under the concentration versus time curve (AUC0-12h) for a given target C0. However, it could be expected that SPKTR achieve a different AUC0-12h for the same target C0, presumably as a result of an altered absorption due to diabetic gastroparesis.
Methods: In this real-life observational cohort study, we investigated whether SPKTR differed in their pharmacokinetics of tacrolimus from KTR. The ratio of the AUC and the target trough level (AUC/C0) was used as a marker for the pharmacokinetics of tacrolimus. The AUC0-12h and the C0 were routinely measured at week one, week six, month six and year one post-transplant. At week one, the AUC0-12h was determined using samples obtained at 0, 1,2,3,4,5 and 6 hours. At week six, month six and year one, the AUC0-12h was determined using samples obtained at 1,2,3 hours. Patients were selected at random from the transplantation database of our center. A linear mixed effects model was used to investigate the association between the type of transplantation and the AUC/C0 adjusting for patient id as a mixed effect, the age at transplantation and the amount of weeks since transplantation as fixed effects.
Results: A total of 752 measurements were performed in the first year post-transplantation in 79 KTR and 66 SPKTR. We found that KTR had an AUC/C0 of on average 1.27 higher ($p < 0.001$) than SPKTR. Furthermore, the AUC/C0 did not significantly change over the period of 1 year post transplantation ($\beta = -0.00018$, $p = 0.8$).
Conclusions: SPKTR achieve a lower AUC0-12h for a given target C0 as compared to KTR. The lower average AUC0-12h/C0 in the SPKTR population could reflect a decreased absorption as a result of diabetic gastroparesis. Furthermore the AUC/C0 does not change over time. Future guidelines should take into account that SPKTR are on average pharmacokinetically different from KTR.

Predominant population released during normothermic machine perfusion of human kidneys prior to transplantation consists of monocytes and NK cells

R.C. Dijkland[1], L.W.D. Knijff[2], A.S. Arykbaeva[1], J.B. Doppenberg[3], S. Heidt[4], C. van Kooten[5], I.P.J. Alwayn[6], D.K. de Vries[7], [1]Heelkunde, LUMC, Leiden, [2]Interne geneeskunde, LUMC, Leiden, [3]LUMC transplant center, Leiden University Medical center, Leiden, [4]Immunologie, LUMC, Leiden, [5]Interne Geneeskunde, LUMC, Leiden, [6]Heelkunde, divisie transplantatie, Leids Universitair Medisch Centrum, Leiden, [7]Heelkunde, Leids Universitair Medisch Centrum, Leiden, Nederland.

Background: Normothermic machine perfusion (NMP) has emerged as a promising technique to enhance organ preservation and reconditioning before transplantation. However, its potential immunomodulatory effects are not completely understood. NMP potentially allows for assessment of immune cells in isolated organs. This study aims to characterize immune cell trafficking from kidney grafts during NMP, providing insights into kidney graft immunogenicity.
Methods: Human donors kidneys deemed not suitable for transplantation (n=7) were put on machine perfusion using a red blood cell-based perfusate and a Kidney Assist (XVIVO) device (37°C, 75-85 mmHg, 6h). Prior to, at 1, 3 and 6h of perfusion a 5mL perfusate sample was taken and analyzed immediately. Red blood cells (RBC) were depleted using magnetic beads and cells were stained using a basic leukocyte antibody panel (CD3, CD4, CD8, CD14, CD19, CD45, CD56 and live/dead marker). The samples were analyzed using the Cytek 3-laser Aurora flow cytometer and the results were analyzed using FlowJo. Additionally, human donor kidneys (n=5) were put on NMP for 1h and subsequently transplanted (PROPER-study, NCT04693325). Donor, preservation and recipient characteristics were recorded.
Results: At the start of perfusion, before the kidney is attached to the system, leukocytes can be found in the leukocyte depleted RBC-based perfusate (mean 524,000 cells total). Most leukocytes are released into the perfusate within the first hour of perfusion (mean 15mln cells total) at remained stable thereafter. Analysis of different leukocyte subsets showed mainly release of monocytes and NK cells (average 31% and 24% of total cells released). Neutrophils accounted for 34% of the total released cells. However, no specific neutrophil marker was used, so neutrophil identification was based solely on forward and side scatter. B and T cell subsets were released to a lesser extent. Data of the transplanted kidneys was comparable to the discarded kidneys.
Conclusions: Early mobilization of donor resident immune cells occurs during renal NMP, with mainly NK cells and monocytes released during 6 h perfusion. The potential immunomodulatory effect of NMP may provide a therapeutic window to decrease the immunogenicity of kidney grafts before transplantation. In order to better understand this phenomenon, a next step would be to evaluate the function of these extravasated leukocytes.

Tissue-resident memory T cells in human kidney transplants have alloreactive potential

D.M. Hullegie-Peelen[1], H. Tejeda Mora[2], M. Dieterich[1], S. Heidt[3], M.J. Hoogduijn[1], D.A. Hesselink[4], C.C.B. Baan[5], [1]Internal Medicine, Division of Nephrology and Transplantation, Erasmus MC Transplant Institute, Rotterdam, [2]Internal Medicine, Erasmus MC Transplant Institute, University Medical Center Rotterdam, Rotterdam, [3]Immunologie, LUMC, Leiden, [4]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [5]Internal Medicine, Erasmus Medical Center, Rotterdam, Nederland.

Background: The extent to which tissue-resident memory T (T_{RM}) cells in transplanted organs possess alloreactivity is unknown. This study investigates the alloreactive potential of T_{RM} cells in kidney explants from four patients who experienced severe acute rejection leading to graft loss.
Methods: Alloreactive T-cell receptors (TCRs) were identified in pre-transplant blood samples through mixed lymphocyte reactions, followed by single-cell RNA and TCR sequencing (10x Genomics) of the proliferated recipient T cells. Subsequently, these TCR clones were traced in the T_{RM} cells of kidney explants, which were also subjected to single-cell RNA and TCR sequencing (10x Genomics).
Results: The proportion of T_{RM} cells expressing an alloreactive TCR in the four kidney explants varied from 0% to 9%. Notably, these alloreactive TCRs were predominantly found in CD4+ and CD8+ T_{RM} cells with an effector phenotype. Intriguingly, alloreactive clones were present not only in recipient-derived T_{RM} cells but also in donor-derived T_{RM} cells, constituting up to 4% of the population, suggesting the presence of self-reactive T_{RM} cells.
Conclusions: Overall, our study demonstrates that alloreactive T cells present in the peripheral blood prior to transplantation can infiltrate the kidney transplant and adopt a T_{RM} phenotype.

Delayed graft function after kidney transplantation: The role of residual diuresis and accumulated waste products

G. Post Hospers[1], W.J. Visser[2], J.G.H.P. Verhoeven[3], M. Laging[4], S.J. Baart[5], I.R.A.M. Mertens zur Borg[6], D.A. Hesselink[7], A.M.E. de Mik-van Egmond[8], M.G.H. Betjes[9], M. van Agteren[3], D. Severs[3], J. van de Wetering[7], R. Zietse[3], M.J. Vos[10], I.P. Kema[10], M.L. Kho[11], M.E.J. Reinders[7], J.I. Roodnat[12], [1]Transplant Institute, Erasmus Medical Center, [2]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center, [3]Transplant Institute, Erasmus Medical Center, Rotterdam, [4]Interne Geneeskunde, Erasmus MC, Rotterdam, [5]Dept. of Epidemiology and Biostatistics, Erasmus MC, Rotterdam, [6]Dept. of Anesthesiology, Erasmus Medical Center, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Dept. of Internal Medicine, Division of Dietetics, Erasmus Medical Center, [9]Erasmus MC Transplant Institute, Division of Nephrology and Transplantation,[10]Clinical Chemistry Metabolic diseases, Groningen, [11]Nefrologie en Niertransplantatie, Erasmus MC, Rotterdam, [12]Nefrologie, Erasmus MC, Rotterdam, Nederland.

Background: Delayed graft function (DGF) is common after kidney transplantation and heralds a worse prognosis. In patients with primary or enteric hyperoxaluria, the prevalence of DGF is high. Oxalic acid and its precursors are waste products that accumulate when kidney function decreases. Oxalic acid may cause tubular inflammation and can crystallize into tubular depositions. Its precursor, glyoxylic acid may also cause inflammation and tubulotoxicity.
We hypothesize that residual diuresis and accumulation of waste products influence the prevalence of DGF.
Methods: Patients who received a kidney transplant between September 2018 and January 2022 participated in the study. Concentrations of oxalic acid and its precursors (µmol/L) were determined in pre-transplant blood samples. Data on residual diuresis (dL/day) and other recipient, donor or transplant related variables were collected.
Results: 496 patients were included. Oxalic acid, glyoxylic acid, and glycolic acid concentrations were above the upper limit of normal in 98.8%, 100%, and 13% of patients, respectively. Median residual diuresis was 1000 mL/day (IQR 200-2000 mL/day). Dialysis type was peritoneal dialysis in 105, hemodialysis in 237 patients, and 154 patients were preemptive. DGF, defined as dialysis in the first week after transplantation, occurred in 157 patients. There were significant differences in patient, donor and transplant related characteristics between the populations with and without DGF. In univariable analysis, amongst others, oxalic acid and its precursor glyoxylic acid and residual diuresis exerted a significant effect on the DGF risk. Multivariable analysis demonstrated a significant influence on the DGF risk by dialysis type, donor type, donor age, donor serum creatinine, and recipient BMI. Besides, glyoxylic acid concentration (OR 1.12; CI 1.02-1.23), residual diuresis (OR 0.94; CI 0.90-0.98) and glycolic acid concentration (OR 0.88; CI 0.80-0.98) significantly influenced the DGF risk.
Conclusions: Low residual diuresis, high glyoxylic acid and low glycolic acid concentration independently increase the DGF risk. Probably, this is related to toxicity and/or deposition of waste products that accumulated because of insufficient kidney function and decreasing residual diuresis. Treatment aiming at preservation of residual diuresis and decreased accumulation of glyoxylic acid and other waste products as well as pre-emptive transplantation may decrease the prevalence of DGF.

Health-related quality of life is linked to the gut microbiome in kidney transplant recipients

T.J. Knobbe[1], J.C. Swarte[2], J.R. Björk[3], R. Gacesa[3], L.M. Nieuwenhuis[4], S. Zhang[5], A. Vich Vila[3], D. Kremer[6], R.M. Douwes[7], A. Post[8], E.E. Quint[9], R.A. Pol[10], B.H. Jansen[4], M.H. de Borst[11], V.E. de Meijer[12], H. Blokzijl[4], S.P. Berger[1], E.A.M. Festen[3], A. Zhernakova[13], J. Fu[14], H.J.M. Harmsen[15], S.J.L. Bakker[8], R.K. Weersma[4], [1]Interne geneeskunde, Nefrologie, UMC Groningen, [2]Interne geneeskunde, Nefrologie & Maag-, darm-, leverziekten, UMC Groningen, [3]Maag-, Darm, en Leverziekten en Genetica, UMC Groningen, [4]Maag-, Darm, en Leverziekten, UMC Groningen, [5]Maag-, Darm, en Leverziekten, [6]Interne Geneeskunde, Nefrologie, UMC Groningen, [7]Maag-, Darm, en Leverziekten en Interne Geneeskunde, Nefrologie, UMC Groningen, [8]Interne Geneeskunde, UMC Groningen, [9]Chirurgie, UMC Groningen, [10]Chirurgie, UMC Groningen, [11]Interne geneeskunde, UMC Groningen, [12]Dept. of Surgery, University Medical Center Groningen, [13]Genetica, UMC Groningen, [14]Genetica en Kindergeneeskunde, UMC Groningen, [15]Microbiologie en infectiepreventie, UMC Groningen, Nederland.

Background: Kidney transplant recipients (KTR) have impaired health-related quality of life (HRQoL) and suffer from intestinal dysbiosis. Increasing evidence shows that gut health and HRQoL are tightly related in the general population. We investigated the association between the gut microbiome and HRQoL in KTR.
Methods: Data from the TransplantLines Biobank and Cohort study and the Dutch Microbiome Project were used. Feces samples were analyzed using metagenomic sequencing. HRQoL was assessed using the validated Short Form 36 questionnaire.
Results: Data from 507 recipients (mean age 57±13y, 45% female, median 5.0 [IQR 1.0-2.0] years post-transplant) and 1183 age-, sex- and BMI-matched general population controls were used. Multiple bacterial species were associated with lower HRQoL, many of which have previously been associated with adverse health conditions. Gut microbiome distance to the general population is highest among KTR with an impaired physical HRQoL ($R=-0.20$, $P=2.3\times10^{-5}$) and mental HRQoL ($R=-0.14$, $P=1.3\times10^{-3}$). Physical and mental HRQoL explain a significant part of variance in the gut microbiome ($R^2=0.63\%$, $FDR=5.40\times10^{-4}$ and $R^2=0.37\%$, $FDR=1.40\times10^{-3}$, respectively). Additionally, multiple metabolic and neuroactive pathways (gut brain modules) are associated with lower HRQoL.
Conclusions: While the observational design of our study does not allow us to analyze causality, we provide a comprehensive overview of the associations between the gut microbiome and HRQoL while controlling for confounders.

Lipid-lowering effect of rosuvastatin compared to other statins post-heart-transplantation

B.C.J. van Dijk[1], D. Bos[2], S. Roest[1], M.M. Goedendorp-Sluimer[1], J.J. Brugts[1], A.A. Constantinescu[1], R.M.A. van der Boon[1], Y.J.H.J. Taverne[3], R.P.J. Budde[4], K. Caliskan[1], O.C. Manintveld[5], [1]Cardiology, Erasmus MC, Rotterdam, [2]Radiology & Nuclear Medicine / Epidemiology, Erasmus MC, Rotterdam, [3]Cardiothoracale Chirurgie, Erasmus MC, Rotterdam, [4]Radiology & Nuclear Medicine / Cardiology, Erasmus MC, Rotterdam, [5]Cardiologie/Transplantatie instituut, Erasmus MC Rotterdam, Nederland.

Background: Patients who underwent heart transplantation (HTx) are at risk of cardiac allograft vasculopathy (CAV). Clinical guidelines recommend statin therapy, in particular pravastatin, given proven beneficial effects on long-term clinical outcome after HTx and the low prevalence of side effects. Yet, rosuvastatin is known to be more potent and unlike pravastatin, is not metabolized by CYP3A4 enzymes, meaning that the drug-drug interaction potential is reduced. We investigated the lipid-lowering effect of rosuvastatin compared to less potent statins in post-HTx patients under contemporary immunosuppression.
Methods: We conducted a before-after study, in which we included all post-HTx patients whom were prescribed a change from the statin they were using to rosuvastatin between July 2016 and July 2022. We assessed the change in the lipid profile of these patients up to one year prior to and after the change of statin. The lipid profile included total cholesterol, low-density lipoprotein (LDL) levels, high-density lipoprotein (HDL) levels and triglycerides. We compared the difference in lipid levels before the change with those after the change using Wilcoxon signed rank test.
Results: We included 110 patients (29 females, 26%), with a median age of 58 [IQR 50-67] years at statin switch. Median time since HTx was 9 [IQR 5-15] years. Median dose of rosuvastatin was 10 [IQR 5-10] mg and 20 [IQR 10-40] mg for pravastatin. Before switching to pravastatin, 87 (79%) were on pravastatin, 22 (20%) on atorvastatin and 1 (0.1%) on simvastatin. The total cholesterol levels changed from a median of 4.6 [IQR 3.9-5.2] mmol/L to 4.0 [IQR 3.4-4.5] mmol/L ($p<0.001$). LDL levels changed from a median of 2.7 [IQR 2.3-3.1] mmol/L to 2.0 [IQR 1.6-2.5] mmol/L ($p<0.001$). The level of triglycerides lowered significantly from 1.7 [IQR 1.3-2.4] mmol/L to 1.6 [IQR 1.1-2.2] mmol/L ($p=0.003$). HDL-levels showed no significant difference ($p=0.845$).
Conclusions: Our results show rosuvastatin as being a more effective alternative to other statins in lowering lipid levels of post-HTx patients. Further research is ongoing to determine if rosuvastatin is as effective for long-term outcomes and to determine side-effects of rosuvastatin use.

Living kidney donation – A narrative review of long-term psychosocial outcomes

E.K. Massey[1], A.D. Rule[2], A.J. Matas[3], [1]Erasmus MC Transplant Institute, Dept of Internal Medicine, Erasmus MC, Rotterdam, Nederland, [2]Mayo Clinic, [3]University of Minnesota, Verenigde Staten.

Background: Living kidney donors make a significant contribution to alleviating the organ shortage. The aim of this review was to provide an overview of living donor psychosocial outcomes and highlight areas that have been understudied and should be immediately addressed in both research and clinical practice.
Methods: We conducted a narrative review by searching three databases. A total of 254 articles were included. Living donors were divided into specified donors (those who donate to an emotionally or genetically related person) and unspecified donors (those who donate to an emotionally or genetically unrelated recipient).
Results: The most commonly investigated psychosocial outcome after living donation was quality of life, other aspects include specific aspects of mental health such as depression as well as fatigue & pain. Social outcomes investigated include financial & employment burden and problems with insurance. Donation specific outcomes reported on were regret, satisfaction, feelings of abandonment and unmet needs, and benefits of living kidney donation. Mental and physical health among the majority is equivalent to or higher than matched non-donor controls. QoL quickly returns to baseline. However, almost all studies also identify a small group of donors who fair less well with regard to psychosocial outcomes. Numerous studies identify similar factors for postdonation reduced QoL. The experience of living donation is complex and multifaceted which is reflected in the co-occurrence of both benefits and burden after donation. Noticeably, very few interventions have been developed to improve psychosocial outcomes after living donation. Quantitative studies have been enriched by qualitative studies adding greater understanding of the lived experience.
Conclusions: Psychosocial outcomes including mental health, health-related quality of life and well-being are positive for the majority of donors. We highlight areas for methodological improvement and identified three areas requiring immediate attention from the transplant community in both research and clinical care: 1) recognizing and providing care for the minority of donors who have long-term physical and psychosocial issues relating to donation; 2) minimizing donation-related financial burden; 3) studying interventions to minimize long-term psychosocial problems.

Functional outcomes after different lymphocyte-depleting therapies for T cell-mediated kidney transplant rejection

L.K. van Vugt[1,2], E. Tegzess[3], M. van der Zwan[4], B. de Winter[5], M.C. Clahsen-van Groningen[6], M.E.J. Reinders[7], J.S.F. Sanders[8], S.P. Berger[9], D.A. Hesselink[7], [1]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [2]Dept. of Internal Medicine, Division of Nephrology, Erasmus MC Transplant Institute, Rotterdam, [3]Dept. of Internal Medicine, Division of Nephrology, UMCG, Groningen, [4]Dept. of Internal Medicine, A Schweitzer Hospital Dordrecht, Dordrecht, [5]Dept. of Hospital Pharmacy, Erasmus MC, University Medical Center Rotterdam, Rotterdam, [6]Pathology, Erasmus MC - Dept. of Pathology and Clinical Bioinformatics, Rotterdam, [7]Internal Medicine, Transplant institute, Nephrology and Transplantation, Erasmus MC, Rotterdam, [8]Nefrologie, UMC Groningen, [9]Interne geneeskunde, Nefrologie, UMC Groningen, Nederland..

Background: Anti-thymocyte globulin (ATG) is the recommended lymphocyte-depleting therapy for severe or glucocorticoid-resistant T cell-mediated kidney transplant rejection (TCMR). Because of an easier mode of administration and fewer infusion reactions, alemtuzumab has been advocated as an alternative to ATG. It is, however, unknown if both therapies are equally effective. Therefore, graft survival and graft function were compared between patients treated with alemtuzumab or ATG for severe kidney TCMR.
Methods: This retrospective study compares ATG with alemtuzumab for severe or glucocorticoid kidney transplant TCMR between two different transplant centers. Patients were included between January 1st 2012 and January 1st 2022. Graft loss was defined as return to dialysis or re-transplantation and was analyzed as competing risk with death-with-functioning-graft. The non-parametric estimate of the cumulative incidence of death-censored graft loss was computed and compared between the two groups with the Gray's test. The eGFR of the two groups at different time points after therapy were compared with the unpaired Mann-Whitney U test.
Results: 130 alemtuzumab-treated and 53 ATG-treated patients were included. There were some transplant center-related differences between the two groups: ATG-patients more often received a kidney from a DCD donor. Furthermore, ATG-patients were more frequently treated with triple maintenance immunosuppressive therapy. The cumulative incidence of graft loss did not differ significantly (p=0.23). Graft loss at one, three and five years after therapy was 23.2, 31.5 and 33.7% for alemtuzumab-treated patients and 13.7%, 19.6% and 27.2% for ATG-treated patients (ns). Median eGFR was not significantly different between the two groups at any of the time-points.
Conclusions: Treatment with alemtuzumab is equally efficacious as ATG for severe TCMR after kidney transplantation. However, the underlying differences between the two participating centers must be taken into account when interpreting these results.

The effects of an exercise training program in kidney transplant recipients on physical fitness

F. Hartgens[1], J.A. Netjes[2], A.H.M. Kooistra[3], A.D. van Zuilen[3], [1]Division Brain, Dept. of Rehabilitation, Physiotherapy Science and Sports, UMC Utrecht, [2]Revalidatie, Fysiotherapiewetenschap en Sport, UMC Utrecht, [3]Nefrologie, UMC Utrecht, Nederland.

Background: Patients with end-stage kidney failure often experience lack of physical activity, reduced exercise tolerance and decreased quality of life. Kidney transplantation improves survival and quality of life. To enhance physical fitness and quality of life we introduced an exercise training program as part of an integrative lifestyle program for patients after kidney transplantation. Study objective: To evaluate the effects of an exercise training program in kidney transplant recipients (KTRs) on physical fitness.
Methods: Study design: Retrospective study. Subjects: 43 KTRs. Exercise training program: A 26 weeks lasting personalized exercise training program (6 weeks in hospital supervised by a physiotherapist, followed by 20 weeks unsupervised training program at home. Starting 8 weeks post-surgery, 2-3 sessions per week, combination of aerobic and strength training. Primary outcome: Physical fitness measured by peak oxygen consumption (VO2peak, in ml/min and ml/kg/min). Secondary outcomes: Performance assessed by maximal work load in Watt (Wmax and Wmax/kg). Exercise metabolism measured by oxygen consumption (VO2) and heart rate (HR) at the 2 ventilatory thresholds (VT1 and VT2). Cardio-Pulmonary Exercise Testing (CPET): Data were collected during a maximal CPET on a bicycle ergometer using a ramp protocol. Study period: 6 months, with measurements just before the start of the exercise training program (7 weeks post-surgery) and 6 months later (33 weeks post-surgery). Statistical analysis: Data presented as mean ± s.d. Data between baseline and after the intervention was analyzed using the paired t-test.
Results: Absolute and relative VO2peak increased significantly from 1713.7±474.7 to 1903.3±550.0 ml/min ($p<0.01$) and from 21.69±6.94 to 25.24±9.29 ml/kg/min ($p<0.01$). Peak work load improved significantly from 141.7±45.5 to 159.4±53.7 Watt ($p<0.01$), as was observed for relative work load from 1.86±0.71 to 2.05±0.61 Watt/kg ($p<0.01$). Both VO2 at VT1 (13.08±3.49 to 14.05±3.90 ml/kg/min; $p<0.05$)) and VO2 at VT2 (18.55±5.82 to 20.30±7.00 ml/kg/min; $p<0.05$) increased significantly. Heart rates at maximal work load, at VT1 and at VT2 remained unaltered.
Conclusions: A personalized 26-weeks lasting exercise training program (6 weeks supervised followed by 20 weeks unsupervised home-based) starting 8 weeks post-surgery resulted in significant improvements of physical fitness (VO2peak) and maximal performance (Wmax), whereas maximal heart rate (HRmax) remained unchanged. Moreover, VO2 at VT1 and VT2 also showed significant improvements, but heart rate at both thresholds did not change.