



Annual Report 2019

# Transplantation Center University Hospital Zurich

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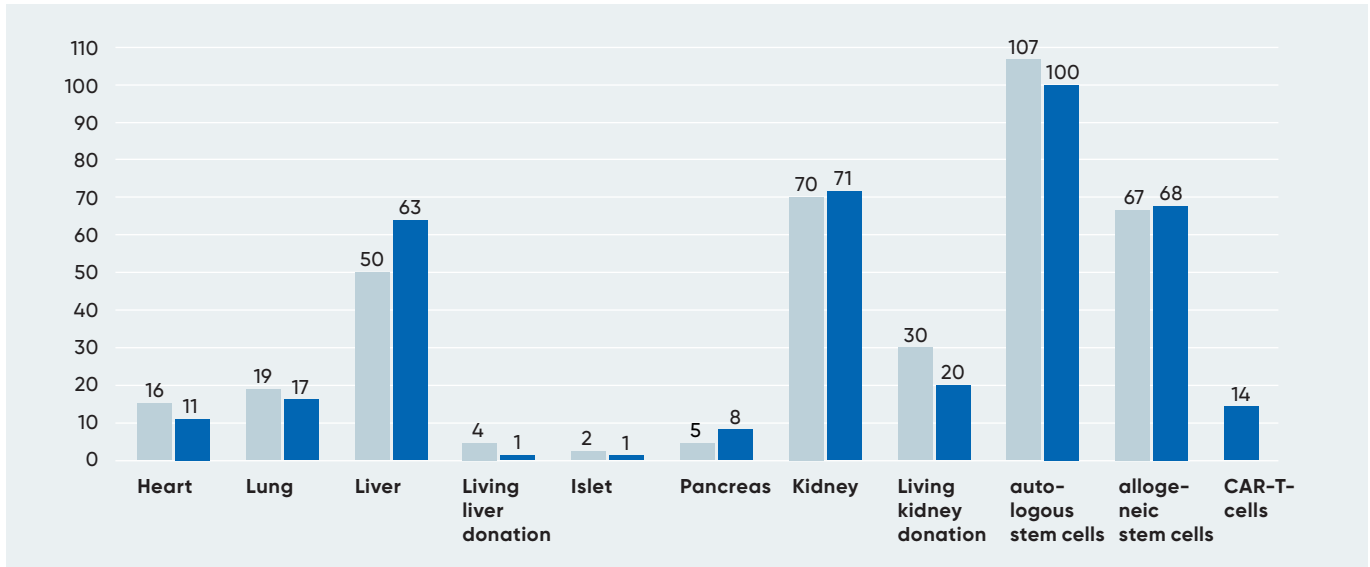
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# 1 The Transplantation Center in its 13th year of operation – Summary

Prof. Dr. Nicolas Müller, Head of the Transplantation Center

Number of organ and stem cell transplantations in 2018 and 2019

2018 2019



In 2019, there were a total of **192** solid organ transplantations (2018: **196**); **22** patients died while on the waiting list for organ transplantations (2018: **32**).

## Transplantation Center

In 2019, the number of transplantations involving dead donors remained at a very stable level and even increased significantly with respect to liver transplantations. There was a slight decline in the number of living donors on record.

An important milestone in the middle of the year was the retirement of Walter Weder, the Swiss pioneer for lung transplantation. He had a huge influence over an entire era and trained several generations of transplantation surgeons and specialists. Today's program is essentially building on the innovative work carried out by Walter Weder, and his legacy will live on long into the future.

Another of our veterans of transplantation, Barbara Rüsi, has left us after having reached retirement age. In her role as the Head of HLA Typing, she has been on board from the very beginning and thanks to her immense experience, she has made a vital contribution to the success of the Transplantation Center in Zurich. The team that she built up and also managed with great human competence will continue to work in her spirit.

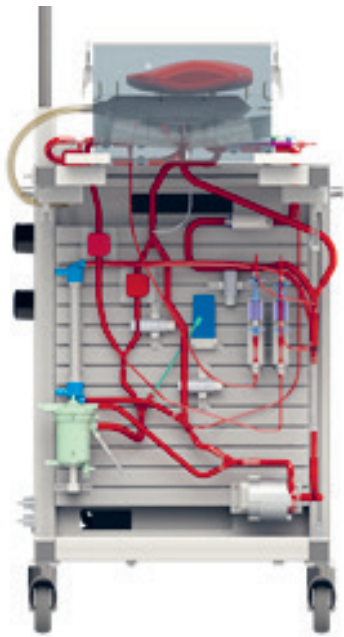
Christian Benden, medical director of lung transplantation, has moved on to new horizons and joined the Swisstransplant team. We wish him all the best in his new role focusing on donations!

## Boards and authorities

In 2019, the Transplantation Center was put through its paces with the FOPH/Swissmedic inspection – it passed successfully renewing the licence for 5 years. We would like to take this opportunity to thank everyone for the successful preparation guided by Uschi Schäfer!

## Research and training

The Center was highly successful once again this year with 59 publications. Amongst them the Liver4Life project deserves special mention. This project brings together the highly specialized technical expertise and the biomedical knowledge held by the University Hospital Zurich (UHZ), the ETH Zurich and the University of Zurich (UZH) under the auspices of Wyss Zurich. Wyss Zurich promotes the translation of outstanding research findings into innovative treatment methods and new technologies and products. This multidisciplinary team of researchers succeeded in



Eshmuminov D, Becker D, Bautista Borrego L, Hefti M, Schuler MJ, Hagedorn C, Muller X, Mueller M, Onder C, Graf R, Weber A, Dutkowski P, von Rohr PR, Clavien PA: An integrated perfusion machine preserves injured human livers for one week, *Nature Biotechnology*, January 2020, doi: 10.1038/s41587-019-0374-x

developing a machine that can keep a liver alive ex-vivo for a week. The technology makes it possible to check and handle donor livers outside of the body and thus expand the pool of donors, which could in the future benefit a great many people with serious liver disease.

#### **Objectives for 2020**

- Renewal of the support from the Swiss National Science Foundation for the Swiss Transplant Cohort Study
- Stem cell/immune cell therapy in 2020: successful passing of the JACIE (joint accreditation committee ISCT/EBMT) inspection
- Development of the program for mechanical circulatory support (the "artificial heart" program)
- Increasing the number of lung transplantations in 2020 to 25
- Expansion of the Transplantation Center treatment guidelines to include immunosuppressive agents
- Establishment of uterus transplantations (symposium in January 2020)

## 2 Center-specific and integrative functions

### 2.1. Transplant Coordination

Lea Kinteh-Vischherr, Head of Transplant Coordination

In 2019, Transplant Coordination was once again an important and reliable key element of transplantation surgery. In addition to the coordination of organ donations at the UHZ, the unit also focused on the quality assurance processes involved in the management of patients on the waiting list. Changes were made to internal processes and applications, thus ensuring that all of the available information is up-to-date and accessible. The optimization of processes carried out during evaluation examinations together with the responsible nursing and medical colleagues on the respective wards likewise also helped to increase patient satisfaction and to improve the interdisciplinary collaboration.

The FOPH/Swissmedic inspection at the end of the year proved to be a highlight in this respect. Working together with the Quality Management department of the Transplantation Center, all of the processes and forms were inspected and updated in working groups. Thus, weaknesses were identified and improvements were initiated. Thanks to this excellent preparatory work, the inspectors subsequently awarded us an outstanding score in their inspection.

The start of the Swiss KPD program in October 2019 represented a milestone in terms of living donor kidney donation. The active involvement and collaboration of our responsible colleague in the initial exploratory meetings and the subsequent activities played a significant role in the success of the program.

We enjoyed an important measure of success in the digitization of old patient records. All organ recipient data has been fully scanned and made digitally available to people with access authorization. The digitalization of old donor documents at the end of the year.

In the restructuring of the team, our main priority was to consolidate the team structure and culture. The introduction of new measures, such as regular feedback

rounds, group meetings, and the increase in mutual support in the fulfillment of tasks, has provided a great deal of new impetus on both a professional and personal level.

The year was marked by numerous events organized by the Transplant Coordination with the aim of establishing strong patient relationships as well as to promoting collaboration with external service providers. These events included information evenings for patients on the waiting lists for kidneys and livers, as well as an information event for our external nephrologists. We also paid visits to selected dialysis centers.

Colleagues from Transplant Coordination supervised a number of vocational school students and high school graduates in their final assignments and helped them to achieve good grades. By holding lectures within various departments of the UHZ as well as at events and institutions such as Careum, ZINA, XUND, Bülach Hospital, Waid Hospital and the Zurich Children's Hospital medical care days, Transplant Coordination has established a strong position both within and outside of the UHZ.

A number of our team members have successfully passed further education and training courses. Two of our coordinators successfully completed the TPM course in Barcelona. In addition, a colleague successfully obtained the certificate "Schweizerischer Experte Organspende Prozess" ("Swiss Expert in the Organ Donation Process").

#### Human resources

Eight persons were employed in Transplant Coordination as of the end of December 2019.

At the end of 2019, this meant coverage of 5.6 FTEs for the on-call service. The on-call service is operational 24 hours a day, 365 days a year.

In total, 1202 hours were coordinated in 2019.

## Patient care

The following figures were recorded for patient care:

### Living donor kidney donations

Evaluations	83
Transplantations	20

### Living donor liver donations

Stage I and II evaluations	19
Transplantations	1

### Liver evaluations

Evaluations	106
Transplantations	64

### Patients accepted to the waiting list

Added to the 2019 waiting list by TPL coordinators

Heart	24
Lungs	24
Liver	87
Pancreas & kidney	7
Islet cells after kidneys	1
Islet cells & kidney	1
Kidney	82
<b>Total</b>	<b>226</b>

### Project work

- OKT
- STATKO
- SDTA
- STALOS
- Quality management

### Presentations

- Classes at Careum
- XUND
- ZINA
- Waid Hospital Nephrology
- Various training sessions on UHZ wards
- Bülach Hospital
- Waid Hospital
- Zurich Children's Hospital medical care days

### Student support

- Interviews for care work
- Written collaboration

### Ongoing professional development

- Thun STS
- EDTCO Copenhagen
- TPM Barcelona
- UHZ Transplantation Center fall symposium
- Various grand rounds

## 2.2. Interdisciplinary HLA Typing Laboratory

Jakob Nilsson MD, PhD, Head Transplant Immunology

Zehra Gündüz, Chief Technician, HLA Typing Laboratory

### Performed analyses

In 2019, the Interdisciplinary HLA Typing Laboratory continued to support the Transplantation Center of the University Hospital Zurich (UHZ) by providing high-quality transplant immunological laboratory analyses. In total, 5595 clinical samples were received in the lab in 2019. We performed 1024 transplant-related HLA-typing analyses and completed 5374 bead-based analyses of anti-HLA antibodies. The laboratory operates a 24/7 on-call service to facilitate the rapid HLA-typing of organ donors, with the aim of ensuring that donated organs may be allocated within the Swiss Organ Allocation System (SOAS). In 2019, we performed HLA-typing and assisted with cross-match testing on 59 deceased organ donors. We also supported the allocation of 83 additional deceased donor organs by performing cross-matches. We assisted the stem cell transplant program by providing transplant immunological analyses of 166 possible stem cell recipients as well as with the HLA typing of 247 potential stem cell donors.

### Organ recipient waiting lists

The HLA Typing Laboratory continuously performs transplant immunological evaluations to maintain adequately updated waiting lists for organ transplantation. As of January 1, 2020, there were 314 patients on the waiting list for a deceased donor kidney. In 2019, there were 95 new patients registered on the waiting list and 91 patients were transplanted with a donor kidney at the UHZ (20 from living donor donations). For lung transplantation, we performed transplant immunological workup on 37 potential recipients, 17 patients were transplanted with a lung at the UHZ and as of January 1, 2020, there were 13 patients on the waiting list for lung transplantation. Immunological workup was also performed on 21 potential recipients of a heart transplant and 11 patients were transplanted at the UHZ in 2019, while 18 patients remained on the waiting list for a heart as of January 1, 2020.

### Notable changes in laboratory procedures

Several changes were made to our laboratory procedures in 2019. We have implemented a procedure for virtual cross-matching (vXM) that was adopted into clinical practice for deceased donor kidney transplantation in January 2018. In 2019, a vXM algorithm was also successfully introduced into clinical use for thoracic organ transplantation. During 2019, we also tested and validated an assay for high-resolution HLA typing. The assay is based on Next Generation Sequencing (NGS). We plan to intro-

duce this NGS assay as our standard assay for HLA typing in the setting of both stem cell and organ transplantation. We also introduced a new method for quantitative real-time PCR-based HLA typing during 2019. This assay improves our HLA typings by shortening the analysis times as well as by providing better results from saliva-extracted DNA.

### Additional information

In 2019, two new technicians (Aline Mita and Isalia Freitas) joined the team. The laboratory also underwent the European Federation of Immunogenetics' (EFI) accreditation process, which resulted in the accreditation being successfully renewed with positive remarks made on the high laboratory standard. The lab also continued to support the ongoing Swiss Transplant Cohort Study (STCS) in 2019 by processing 388 clinical samples from transplanted patients as well as by retrieving and shipping aliquots from stored samples for STCS-approved clinical studies.

## 2.3. Prizes

### Prizes/awards received by the TPLZ or by the clinics in relation to organ transplantations:

- **Prof. Dr. Annette Boehler** (formerly of the Department of Thoracic Surgery) – “Lifetime Achievement Award” from the European Respiratory Society was awarded at the annual International Congress in Madrid for her scientific achievements in the field of transplantation medicine
- **Prof. Dr. med. Silvia Ulrich** (Department of Pneumology) – Ewald Weibel Award 2019
- The Swiss Society for Thoracic Surgery’s prize for the best clinical publication:  
**Ilhan Inci, Sven Hillinger, Didier Schneiter, Isabelle Opitz, Macé Schurmanns, Christian Benden, Walter Weder**, Lung transplantation with controlled donation after circulatory death donors. *Ann Thorac Cardiovasc Surg* 2018;24:296–302
- **Pramitha Kamat, PhD** (Department of Plastic Surgery and Hand Surgery) – received the Science Award from the International Society of Vascularized Composite Allotransplantation for her deep learning project to identify vascular changes in the tunica intima within the development of vasculopathy
- **Dr. med. Riccardo Schweizer** (Department of Plastic Surgery and Hand Surgery) – received the Science Award from the Swiss Plastic Surgery Association for his research project about conditioning and immunotherapy with mesenchymal stem cells



## 2.4. Participation on national and international committees

### Nicolas Müller

- President, Swiss Society of Infectious Diseases
- Member, IVHSM Specialist Body
- Chairman of the Scientific Committee of the Swiss Transplant Cohort Study
- Member of the Scientific Committee of the Swiss Society of Transplantation
- Editorial Board of Xenotransplantation; Transplant Infectious Diseases

### Christian Benden

- ISHLT, Governance Committee Member
  - ISHLT, Scientific Program Committee Past Chair
  - ERS, Transplantation Group Chair
  - TTS, Heart and Lung Committee Member
- Journals:
- Journal of Heart and Lung Transplantation, Editorial Board Consultant
  - Clinical Transplantation, Associate Editor

### Kuno Betschart

- Member of Swiss Nurse Leaders
- Member of the Swiss Transplant Nurses Network

### Olivier de Rougemont

- Member of the Board: STAN, STALOS, STAPS (President)
- Member Comité médical Swisstransplant
- Scientific Committee: Swiss Transplant Cohort Study
- Member MERH (Center of Excellence Medicine Ethics Law Helvetiae)

### Philipp Dutkowski

- President STAL
- Scientific Committee STS
- President STAPT
- Member Comité Medical
- Member DCD Working Group Swiss Transplant
- Member ILTS Special Interest Group DCD/Machine liver perfusion

### Andreas Flammer

- 'President elect' of the Swiss Society of Cardiology Working Group Heart Failure
- Fellow of the European Society of Cardiology (FESC)
- Fellow of the European Heart Failure Association (FHFA)
- Member of the «Diagnosis Committee» and «Working group of heart failure imaging» of the HFA
- Member of the Working Group Heart of Swisstransplant (STAH)

### Lea Kinteh-Vischherr

- Member OKT (core operations team) of the CNDO (National Committee for Organ Donation)

- Member STATKO (Swisstransplant Arbeitsgruppe der Koordinatoren)

### Roger Lehmann

- Past President of the Central European Diabetes Association (FID) 2013–2018
- Board Member of the European Pancreas and Islet Transplant Association 2013–2019
- Scientific Committee: Swiss Transplant Cohort Study

### Antonia Müller

- Vice President, SAKK cellular therapy working group

### Thomas Müller

- Member of the Boards/Scientific Committees (STAN, STALOS)
- President of STALOS Working Group for living organ donation
- Scientific Committee (Swiss Transplant Cohort Study, Swiss National Science Foundation member evaluation body SNF)
- Member Ethics Committee of the University Spital Zürich
- Board Member DICG (Declaration of Istanbul Custodian Group)
- Board Member Swiss Kidney Paired Donation Groups
- Member of the "Living Donor Organ Donation Sub-Committee" of the Swiss Academy of Medical Sciences

### Mjriam Nägeli

- Board member and academic secretary SCOPE (Skin Care in Organ Transplant Patients Europe)
- Scientific Committee Swiss Transplant Cohort Study
- Member ITSCC (International Transplant Skin Cancer Collaborative)

### Jakob Nilsson

- Fellow Transplant Society
- Fellow European Federation of Immunogenetics
- Associate editor Frontiers in Immunology

### Jan Plock

- Member of the Basic Science Committee ESOT, since 2015

### Cécile Robinson

- Member of the Swiss Working Group for CF
- Member of ISHTL

### Urs Schanz

- President of Swiss Blood Cell Transplantation (SBST)
- Member of the Allogeneic Stem Cell Transplantation Commission (KAT)
- Board of Directors, Swiss Transfusion SRC
- Member of the EBMT Nuclear Accident Committee (NAC)

- Senior Editor: Transfusion and Apheresis Science (2013–2015)
- Editorial Board Member of Transfusion and Apheresis Science since 2016

#### **Markus Wilhelm**

- President of the Working Group Heart of Swisstransplant (STAH)
- President of the Swisstransplant Medical Committee
- Member of the Working Group for Procurement and Transportation of Swisstransplant (STAPT)
- Member of the Board of Representatives of the Swiss Transplant Cohort Study (STCS)
- Member of the Working Group Heart Failure of the Swiss Society for Cardiology
- Member of the Mechanical Circulatory Support Council of the International Society for Heart and Lung Transplantation

#### **Marco Zalunardo**

- SGAR: Member/President of Working Groups: Evaluation of Teaching Centers (2), Non-Anesthetist Analgosedation
- SGAR: Committee: Visitation
- SGAR: Committee: Education
- SIWF: Executive Board Member
- SIWF: Member of the Education Grant Jury

## **2.5. Professional development**

Prof. Dr. Nicolas Müller, Member of the TNT Organizing Committee

Our “Hot Topics in Transplantation (TNT)” seminar (TNT Annual Program 2019) ([Annex 6.6](#)) once again showed the wide range of scientific activities being carried out at a local and international level, as reflected in the list of internationally renowned speakers. This was only possible with generous sponsorship (Astellas Pharma AG, MSD AG, Vifor Pharma, Fresenius Medical Care AG) and we would like to take this opportunity to express our sincere gratitude to them!

The 13th Annual Meeting of the Transplant Center “Organ donation” held on November 15, 2019, with participation of the International Advisory Board, highlighted key aspects of organ donation. Renowned speakers were invited, covering a wide range of topics from ethical aspects and organ trafficking to new innovative concepts (new perfusion technology for livers and the new national kidney paired donation program). One of the highlights was the exciting lecture by Dr. Aisling E. Courtney entitled “Living donation: what risk is too risky?”

## **2.6. Swiss Transplant Cohort Study (STCS)**

Prof. Dr. Nicolas Müller, Chairman of the STCS Scientific Committee

As of the end of 2019, 147 nested projects had been evaluated, resulting in 66 publications being published, all with the involvement of UHZ. Zurich is responsible for the highest share of the patients enrolled: of the 7503 patients in total, 2587 or one-third received transplants at the Zurich Transplantation Center. Ensuring that sample-taking and data collection are performed perfectly represents a major logistical challenge. We would like to thank everyone involved in this work! A major challenge for 2020 is the submission of the application for the renewal of the support provided the Swiss National Science Foundation.

# 3 Organ donation network

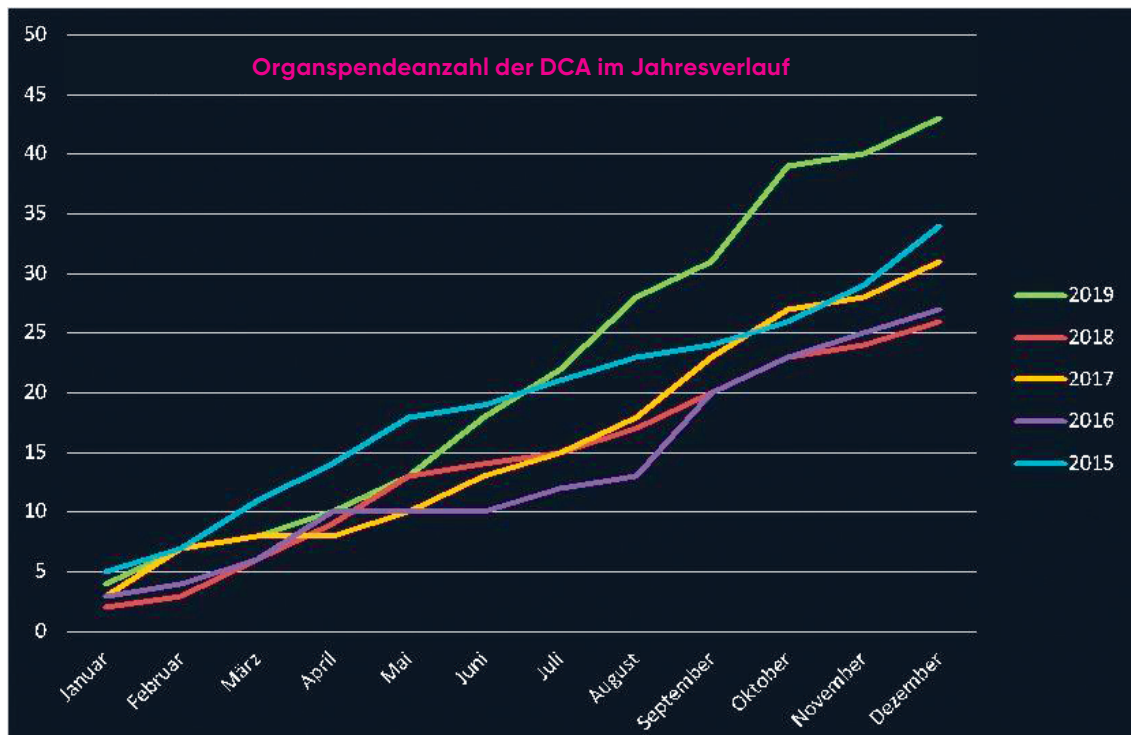
## 3.1. Organ donation activities 2019

A total of 157 organ donors were registered throughout Switzerland in 2019, which corresponds to 18.4 pmp (per million population). A significant increase was recorded in the number of organ donations after circulatory determination of death (DCD), which has now stabilized at just over a third of all donors.

In the DCA organ donation network, 43 postmortem donors were identified in 2019. This is the highest number recorded since the DCA was founded. Almost three-quarters of these donors were from the University Hospital Zurich (UHZ) and one-quarter were from our other network

hospitals. In total, approximately 100 patients with an unfavorable prognosis were evaluated by the Donor Care Managers. In medically often extremely complex situations, clarifications sometimes take several days, involving various specialist areas.

Over 50% of potential donors were ultimately rejected due to unfulfilled requirements (i.e. medical contraindications, lack of consent, non-occurrence of brain death). (This information was taken from the Annual Report of the Donor Care Association).



Source: Annual Report 2019 of the Donor Care Association DCA, page 3

# 4 General care of transplant recipients at the Transplantation Center

## 4.1. Anesthesiological aspects of transplantation

Prof. Dr. Marco P. Zalunardo, Dr. med. Rolf Schüpbach

### 4.1.1. Organization

The active participation of the Patient Blood Manager, Dr. Gabriela Spahn, in the weekly meetings regarding all listed patients for liver transplantations was newly established. In accordance with the "Perioperative anemia and transfusion management" directive, every patient is prepared for the forthcoming transplantation individually in order to provide targeted treatment for the very frequent occurrence of anemia.

### 4.1.2. Clinic

The current figures for transplantations that fall within the scope of the previous year are listed elsewhere.

The TPL team from Anesthesiology carried out 160 consultations for the listed patients. Compared to last year with 128 consultations, this represents a significant increase. This additional workload is covered by the existing Anesthesiology team, which is on duty in the operating room.

## 4.2. Nursing care at the Transplantation Center

Kuno Betschart, Nursing Services Manager MB AST

Ramona Odermatt, Head of Advanced Practice Nurses MB AST

### 4.2.1. Transplantation nursing care

Patients who have been called in for a transplantation are received in the East E III ward and prepared for the upcoming surgery. They then receive postoperative care and assistance following a lung, liver, kidney, pancreas, or islet cell transplantation, or a combined transplantation of several of these organs. In 2019, there was high staff turnover in the E East III nursing team and the professional training of the new colleagues was key. A special team made up of members of the existing team was formed for six months to hold the postoperative educational sessions carried out with all transplant patients. These healthcare professionals worked in half-day shifts, in which they only carried out educational sessions with the transplant patients and, where requested, together with their relatives.

### 4.2.2. Swiss Transplant Care Network

The Swiss Transplant Care Network was founded in 2010 at the initiative of nursing professionals from UHZ. The network members – nursing professionals from all transplantation centers of Switzerland – have met twice a year to discuss current issues in the field of transplantation care. Due to the sharp decline in membership in recent years, the dissolution of the network was decided at the General Meeting in May 2019 and fully implemented by December 2019.

### 4.2.3. APN care consultations

The transplantation care consultations offer patients and their relatives a consulting service prior to and after the transplantation. The consultations are carried out by an Advanced Practice Nurse (APN) and take place as inpatient and outpatient services. The aim is to provide patients and their relatives with the best preparation possible for life with the new organ, for improving their personal responsibility for dealing with illness and for promoting self-management. In so doing, the content and scope of the consultations will be adapted to meet the individual needs of those affected and the requirements the situation demands. Inter-professional collaboration is constantly being developed in an in-depth manner and across disciplines within and outside of the UHZ.

### 4.2.4. Kidney transplantation care consultations

Patrizia Zala, Advanced Practice Nurse in Kidney Transplantation

The kidney transplantation care consultations focus on the patients and their relatives after a kidney transplantation. The initial face-to-face contact takes place during the inpatient stay following the transplantation. In the first months after the transplantation, those affected are provided with two consultations by an APN – further consultations can also be arranged, where necessary. The main issues covered in these sessions are as follows: coming to terms with the new situation, use of medication, and preventing infections and secondary disorders. Approximately 650 consultations were carried out in 2019.

### Collaboration

- **At the UHZ:** Transplantation coordination: As part of the information events for patients on the waiting list and their relatives the APN presented the consulting service in April 2019, and, on request, arranged for an exchange

of experience between two participants with one person who had already been transplanted respectively. Wards: Consultations during inpatient stays are planned and carried out within the treatment team. In this context, the APN is also a resource in complex situations.

Diabetology: In 2019, the guideline for treating elevated blood sugar levels following a kidney transplantation was completely revised, updated, and the interdisciplinary collaboration was expanded. The APN now supports the colleagues in diabetes and nutrition counseling and the medical service in the care for this patient group.

- **Children's Hospital Zurich:** As part of a jointly organized transition afternoon, four young adults made the transition from pediatric to adult medicine in November 2019. All of them received an individual status review and consultation meeting. Depending on their individual needs, they will continue to be accompanied by the APN.

### Information brochures

In addition to the information events and the consultations, patients and their relatives receive three brochures – one covering the preparation for the kidney transplantation, one for the initial period after the transplantation and one for life with the new kidney. The annex "Contact directory and further information" is updated annually.

### Publications

As part of the study on the effects of advice given within the scope of care consultations on health behavior, the following article was published:

Schmid-Mohler, G. et al. (2019). Comparison of a Behavioral Versus an Educational Weight Management Intervention After Renal Transplantation: A Randomized Controlled Trial. *Transplantation Direct*, 5(11) 1-9. <https://doi.org/10.1097/TXD.0000000000000936>

### 4.2.5. Liver transplantation care consultations

Andrea Pfister Koch, Advanced Practice Nurse in Liver Transplantation

The liver transplantation nursing consultations offer advisory services for patients and their relatives before and after transplantation. The content and scope of the consultations are adjusted to meet the individual needs of those affected. The main focal points are as follows:

- Before the transplantation: symptom management, waiting list procedure, health behavior (e.g. stop smoking, nutrition and exercise), and emotional processing of the disease situation
- After the transplantation: medication intake, prevention of infections, self-monitoring, rejection reactions, sun protection, and health behavior

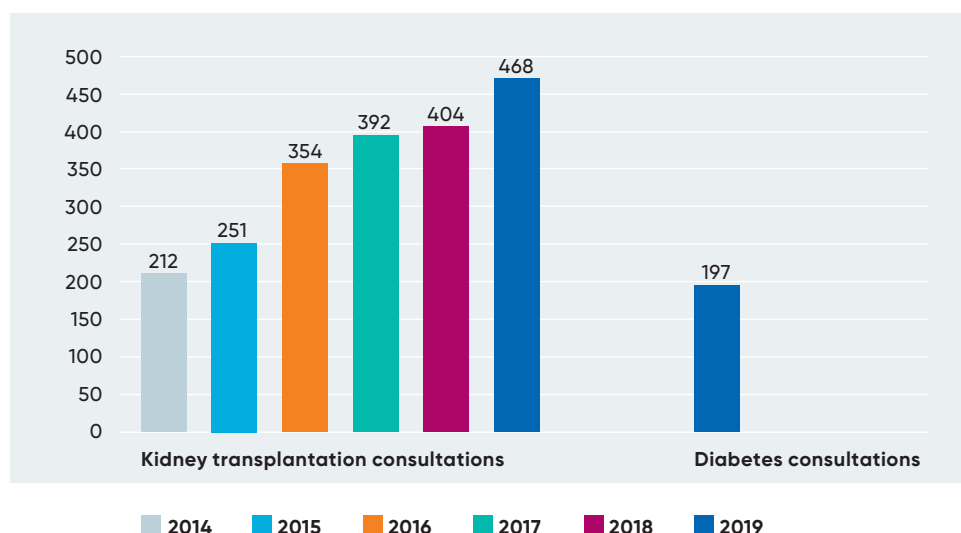
For many of those affected, particularly those who speak foreign languages and/or are very ill, the complex contents of the conversations are a challenge. In collaboration with the Center for Clinical Nursing Science, with doctors and nurses from UHZ and the Cantonal Hospital St. Gallen as well as the St. Gallen-based illustrator Corinne Bromundt, illustrations were developed during two meetings to provide visual aids helping those affected to understand the advice given verbally. 15 images are now available, which are mainly used for foreign-language patients in the care consultation. In comparison with previous years, there has been an increase in outpatient consultations. This can be traced back, among other things, to the extended collaboration with the Medical Service in the outpatient pre- and post-transplantation consultations.

### Collaboration

The collegial and interprofessional collaboration within the UHZ and beyond was also further expanded in 2019.

- **At the UHZ:** The consultations as well as the structured inpatient education during the hospital stay following

Kidney transplantation care consultations



the transplantation are planned and carried out together with the nursing teams of the inpatient wards. The weekly inter-professional case reviews allow the treatment team, comprising the nursing service, APN, medical service, psychiatrist, nutrition counseling, physiotherapy, and Social Services, to quickly respond to the individual needs and coordinate the discharge plan in a timely fashion.

- **Zürcher RehaZentren Davos-Clavadel:** The collaboration with the nursing and medical team has been established with regard to structured education after transplantation. There is a regular exchange of information about the patients looked after together.
- **Kantonsspital St. Gallen (KSSG):** Patients that receive medical care predominantly at KSSG are likewise provided with care consultations by Advanced Practice Nurses in Hepatology at KSSG. The close collaboration allows for a smooth transition between the institutions. Unresolved issues from previous consultations can also be handed over to the Advanced Practice Nurse in the respective hospital.
- **Klinik Adelheid AG, Rehazentrum Zentralschweiz, Unterägeri:** With the aim that from January 2020 liver transplanted patients will have a further option for rehabilitation and thus the discharge process at the UHZ can be accelerated, a training session was held in December with the staff involved to ensure that structured education can be continued after transplantation.

#### Information brochures

In addition to the consultations, patients and their relatives receive the following brochures "Preparing for a liver transplant" and "Life after a liver transplant". The brochures are also used as the basis for the structured inpatient education. The brochure "Living donor liver donations – what donors and recipients need to know" has also been handed out since 2017.

#### Congress presentations

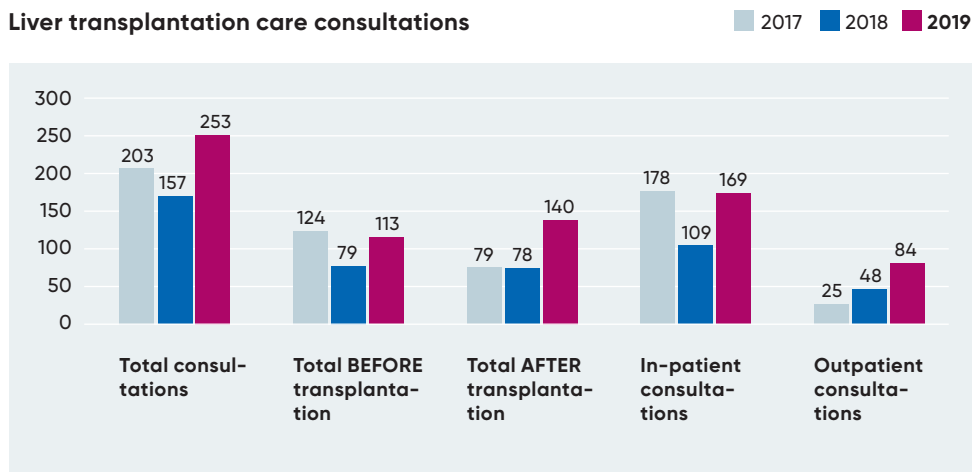
- Fachsymposium Gesundheit, St. Gallen, January 23–24, 2019, poster presentation: Spitalübergreifende Pflegesprechstunde Lebertransplantation: Ein bedürfnisorientiertes Versorgungsangebot. Patrizia Künzler-Heule (KSSG), Sonja Beckmann (UHZ), Andrea Pfister (UHZ)
- SGG-SGVC-SASL-GESKES Annual Meeting 2019, Poster presentation: Illustrations to support patient counseling before and after liver transplantation. Patrizia Künzler-Heule (KSSG), Andrea Pfister-Koch (UHZ), Irina Bergamin (KSSG), Sonja Beckmann (UHZ).

#### 4.3. Infectious disease control for transplant patients

Prof. Dr. Nicolas Müller, Infectiology

Our consultation service recorded 1658 infectious disease consultations including follow-up consultations for patients in connection with transplants in 2019. This corresponds to approximately a quarter of all of the infectious disease consultations held at UHZ. This underlines the importance of the treatment of infectious diseases and their prevention in recipients of a new organ or stem/islet cells. In addition to this on-call service, all new patients on the waiting list for kidney, pancreas or islet cell transplantations were routinely checked for serology, history of infections, and vaccination status. Regular participation in weekly visits to stem cell recipients and patients who recently received a new kidney or pancreas ensures continuous care and close cooperation. An excellent working relationship has also been established with the Donor Care Association in terms of the infectiological evaluation of potential donors. Due to this close collaboration, in some cases donors could be successfully evaluated and their organs used despite an infection history.

Liver transplantation care consultations



#### 4.4. Follow-up care for transplant patients in the Department of Dermatology

Dr. med. Mirjam Nägeli

Recipients of solid organs and bone marrow/stem cells are seen as part of specialized consultations for immunosuppressed patients at the Department of Dermatology. The number of specialized consultations for immunosuppressed patients at the Department of Dermatology has risen once again, with more than 3370 consultations with 2115 patients recorded in 2019 (an increase of 100 patients compared to 2018). The main focus is on the prevention, early detection and treatment of non-melanoma skin cancer (squamous cell carcinomas), which is the most common malignant tumor resulting from long-term immunosuppression. Existing tumors are detected and removed as part of the pre-transplant assessment. In addition, transplanted patients are made aware of the problem of white skin cancer and are trained in prevention through appropriate behavior, clothing and use of sunscreen and in early detection.

##### Information brochures

In addition to advice, new patients receive the "Suppressed immune defenses in the skin" brochure.

##### Studies

As part of a multi-center European study, we are monitoring how many of our patients are affected by skin cancer metastases and which factors present an increased risk. We thereby hope to identify patients with the greatest need at an early stage and tackle this in a targeted manner.

##### Participation on international committees

Close collaboration with transplant dermatologists through Skin Care in Organ Transplant Patients Europe (SCOPE) and the International Transplant Skin Cancer Collaborative (ITSCC) in the USA.

##### Presentations in 2019

- M. Nägeli: «Checkpoint inhibitors in sOTR»: Organ transplantation working group for the SGD (Schweizerische Gesellschaft für Dermatologie und Venerologie – Swiss Society for Dermatology and Venereology), annual congress held in Basel on September 19, 2019
- M. Nägeli: "Checkpoint inhibitors in solid organ transplant recipients (sOTR): Zurich's experience" at the SCOPE annual meeting held in Barcelona on September 26–28, 2019.
- M. Nägeli: "Extracorporeal photopheresis and sun protection" at the Patients' Day for stem cell transplant patients at UHZ on October 26, 2019

##### Publications

- Kuzmanov A, Qi W, Stenz N, Bochud PY, Kotalik Z, Wojtowicz A, Hofbauer G. rs34567942 a Novel Susceptibility Single Nucleotide Polymorphism for Cutaneous Squamous Cell Carcinoma in Organ Transplant Recipients. *Acta Derm Venereol.* 2019 Dec 1,99(13):1303-1304
- Muller YD, Vionnet J, Beyeler F, Eigenmann P, Caubet JC, Villard J, Berney T, Scherer K, Spertini F, Fricker MP, Lang C, Schmid-Grendel Meier P, Benden C, Roux Lombard P, Aubert V, Emmer F, Pascual M, Harr T. Management of allergy transfer upon solid organ transplantation. *Am J Transplant.* 2019 Sept 18
- Longwear E, Stumpf S, Zeppelins A, Salati E, Zaman K, Schäfer N, Schardt J, Siano M, Hofbauer G, the Swiss Transplant Cohort Study. Solid cancer development in solid organ transplant recipients within the Swiss Transplant Cohort Study. *Swiss Med Wkly.* 2019 May 19;149
- Lanz J, Bouwes Bavinck JN, Westhuis M, Quint KD, Harwood CA, Nasir S, Van-de-Velde V, Proby CM, Ferrándiz C, Genders RE, Del Marmol V, Forchetti G, Hafner J, Vital DG, Hofbauer GFL. Aggressive Squamous Cell Carcinoma in Organ Transplant Recipients. *JAMA Dermatol.* 2019 Jan1;155(1):66-71

#### 4.5. Psychosocial care for transplant patients

Dr. med. Andre Richter, Advisory and Liaison Psychiatric Services

Every transplant patient is offered psychiatric care and psychotherapy. This begins with the first consultation and continues during the waiting period and after surgery during their hospital stay. Whenever possible, the same expert handles the respective patient's subsequent treatment. Relatives are also involved in the treatments. Psychosocial evaluations of donors are also carried out. A total of 923 consultations for 753 patients were carried out on the wards. At our outpatient clinic, some 578 patients received care, undergoing a total of 660 longer consultations. The team members also took part in the rounds and interdisciplinary case reviews in the departments as well as in the listing colloquia.

Since 2018, Dr. med. Andre Richter has represented the Services on the Board of Directors of the Transplantation Center. The team is part of the Advisory and Liaison Psychiatric Services unit of the Department of Consultation-Liaison Psychiatry and Psychosomatic Medicine. This department is headed by Dr. med. Sebastian Euler. The team consists of three FMH-certified attending physicians specializing in psychiatry and psychotherapy with additional qualifications in consultative and liaison psychiatry or psychosocial medicine (180 FTE) as well as one specialist psychologist for psychotherapy (0.6 FTE).

# 5 Individual transplant programs

## 5.1. Allogeneic stem cell transplantation

PD Dr. Urs Schanz, Department of Hematology

The allogeneic transplantation figures increased slightly once again at 68 (2018 n = 67, 2017 n = 55, 2016 n = 56). The most common indications for allogeneic stem cell transplantation remained myeloid neoplasms (n = 47). The cumulated transplant-related one-year mortality rate remained below 10%, which is encouragingly low and stands up well to international comparison.

Pursuant to the slight increase in the total number of transplantations, the number of transplantations with unrelated donors increased to 35 (2018 n=33), the number of related donors remained stable at 33 (2018 n=34), with the latter group of donors including 18 HLA-identical siblings and 15 donors who were haploidentical children, parents, or siblings (2018 n = 11, 2017 n = 6). Thus, haploidentical transplantations increased once again and we are interested to see whether this trend will continue next year. The number of reduced intensity conditioning cases reached again the value of 2017 at 74% (2018: 68%, 2017: 73%).

The evaluation and supply of transplants from healthy, voluntary donors for other centers in Switzerland and around the world stayed on par with last year at 44 (2018 n = 43, 2017 n = 36).

## 5.2. Autologous stem cell transplantation

PD Dr. Antonia Müller, Department of Hematology

2019 continued to be a productive and successful year for our autologous stem cell transplant program. Of the 100 procedures in total, the majority were performed on myeloma patients (n=60). Other indications were Non-Hodgkin's Lymphoma (n=25), Hodgkin's lymphoma, acute myeloid leukemias, and solid tumors (germ cell tumors and Ewing sarcomas).

One of the most remarkable aspects is that our program for high-dose chemotherapy with autologous stem cell rescue in patients with multiple sclerosis attracts many patients from all over Switzerland. We hold monthly Neuroimmunology/Hematology board meetings in which

we discuss patients and decide who is a candidate for this intensive immune modulation. In 2019, a total of 10 MS patients underwent autologous stem cell transplantation.

The other noteworthy innovation in terms of the autologous program is the introduction of chimeric-antigen-receptor T cell (CAR-T) treatments at our hospital. Autologous lymphocytes are collected from patients by apheresis and thereafter genetically modified to target defined tumor antigens. On April 3, 2019, we were able to successfully infuse our first patient with a CD19-directed CAR-T cell product. Two treatments currently commercially available are Tisagenlecleucel (Kymriah, Novartis) and Axicabtagene ciloleucel (Yescarta, Kite/Gilead), both of which target the B-cell antigen CD19. Our department is certified for both products. In 2019, we used these new cell therapies to treat a total of 14 patients with relapsed/refractory Non-Hodgkin's lymphoma.

## 5.3. Heart transplantation

Prof. Markus Wilhelm, Cardiovascular Surgery

PD Dr. med. Andreas Flammer, Cardiology

Due to the increasing shortage of donors, the number of heart transplantations recorded in 2019 was slightly lower, at 11, compared to the record results of the two previous years with 16 and 17 heart transplants respectively. In comparison with transplantations carried out in other countries, the survival rate following a heart transplantation is above average. The one-year survival rate at UHZ over the last five years is calculated as 90%. Four out of the eleven patients (36%) who received a heart transplant in 2019 had previously had a ventricular assist device until their transplant, with three patients having a left ventricular assist device (LVAD) and one having a bi-ventricular assist device (BVAD). In addition, two infants aged 7 months and one toddler aged 17 months were among the heart transplant patients in 2019.

Nine patients were provided with ventricular assist devices in 2019 (Fig. 1). Five of the nine patients (56%) were classed as high-risk patients and were changed from a percutaneous circulatory support system (4 ECLS, 1 Impella) to a ventricular assist device. One patient was given a bi-ventricular assist device and eight a left-



ventricular assist device. For the first time, the state-of-the-art LVAD, the so-called HeartMate 3, was used. The HeartMate 3 has a fully magnetically suspended rotor with significantly improved hemocompatibility (Fig. 2). In total, five patients were provided with this LVAD.

In 2019, 123 implantations of ECMO (ExtraCorporeal Membrane Oxygenation) and ECLS (ExtraCorporeal Life Support) were performed, which are used for therapy-refractory acute pulmonary or cardiovascular failure (Fig. 3). Approximately 90% of the implantations were carried out as ECLS in cardiogenic shock and 10% as ECMO in lung failure. The transfer of patients with ECMO/ECLS in 2019 remained on par with the record-high achieved in the previous year. Forty patients treated with ECMO/ECLS at external hospitals and subsequently transported to the University Hospital Zurich using the ECMO/ECLS.

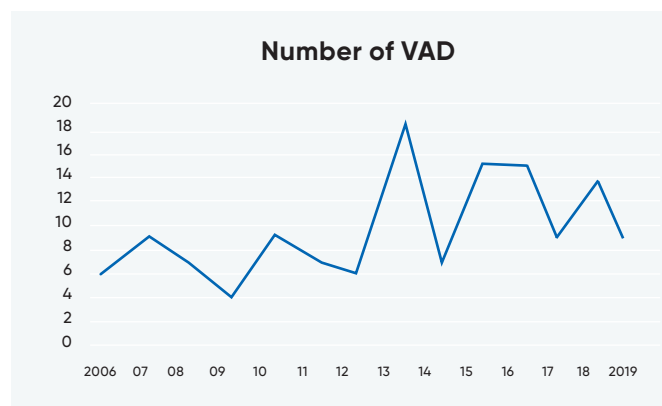


Fig.1: Implantations of ventricular assist devices (VAD) since 2006

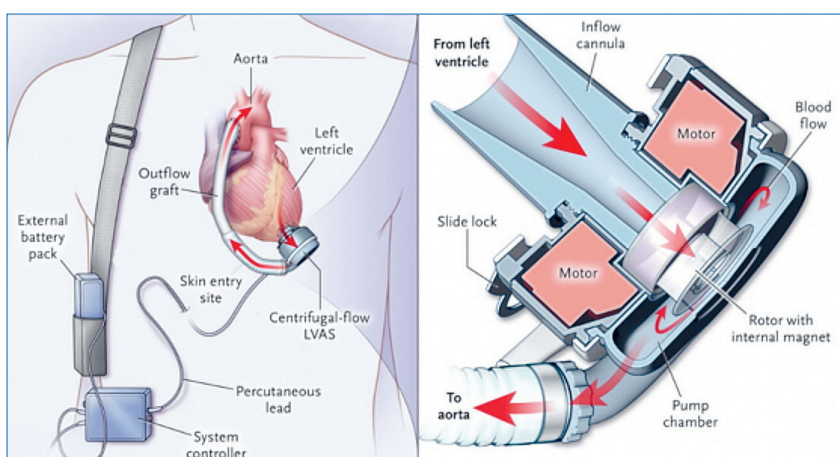


Fig. 2: Left-ventricular assist device (HeartMate 3) (from: Mehra et al., N Engl J Med 2017;376: 440-450)

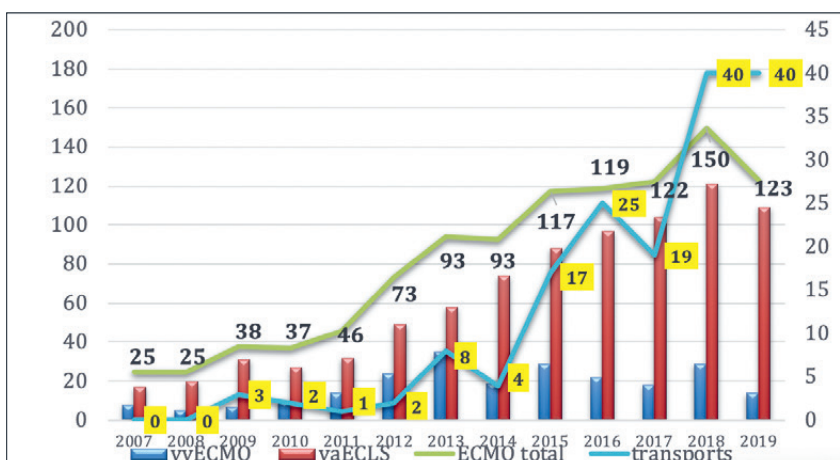


Fig. 3: Number of ECLS/ECMO implantations since 2007

#### 5.4. Lung transplantation

PD Dr. Sven Hillinger, Thoracic Surgery

Dr. med. Carolin Steinack, Pneumology

In 2019, a total of 17 lung transplantations were performed on adults, mainly using perioperative ECMO.

Some 48 patients were referred for evaluation and 45 adult patients were evaluated for lung transplantation. A total of 25 patients were added to the waiting list. The proportion of patients with cystic fibrosis remains low, which can be attributed to the addition of triple CFTR modulator therapy to the Managed Access Program (MAP), which resulted in stabilization and incidentally in significant improvement of health condition of patients with serious CF lung disease.

The collaboration initiated in 2018 between Quartier Bleu, a practice specializing in CF at Lindenhof Hospital in Bern, and the adult CF center at UHZ for the care of patients with advanced CF lung disease and for transplantation evaluation has already proven its worth in 2019 through the increasing number of referrals for transplantation evaluations from its practice.

In 2019, the team once again attended various international congresses and conferences at which they gave presentations. Lung transplantation continues to be a key focus of the research carried out at UHZ. In the field of research, we recruited Dr. Jonas Ehram, who is working closely with Prof. Ilhan Inci on the topic of ex vivo perfusion in small- and large-animal models in order to improve the donor pool. Dr. Ilker and Dr. Necati left our Center in the reporting year and we would like to take this opportunity to thank them for all their hard work.

In summer 2019, Prof. Walter Weder, the founder and long-time Head of the Department of Thoracic Surgery, retired and said his farewells at a symposium featuring high-ranking international speakers. We would like to take this opportunity to express our thanks and pay him the deepest respect for establishing this unit and, in particular, for setting up the transplantation program. Dr. Didier Schreier took over as his temporary successor, heading the Department from July 1 to December 31, 2019. Prof. Isabelle Schmitt-Opitz is appointed the new Director of Department as of 1 January, 2020. This ensures important continuity within the management team. Prof. Ilhan Inci has assumed the role of Head of Surgery within the transplantation program as well as the seat on the Board of Trustees of the Transplantation Center.

At the end of 2019, Prof Dr. med. Christian Benden, former senior staff physician for lung transplantation and CF,

left us to take on a new position as Senior Medical Consultant at Swisstransplant. We would like to thank him for his many years of commitment to lung transplant and CF patients, his outstanding contribution everyday clinical practice within the department and his broad-based research into lung transplantations and CF. His successor is PD Dr. Macé Schuurmans, who had formerly worked as attending physician at the Department for Lung Transplantation and CF, and subsequently been head of Pneumology at Kantonsspital Winterthur. He was appointed senior staff physician at the Department for lung transplantation and CF.

We would also like to thank Dr. Cecile Robinson and Dr. Marino Daniele, both of whom were attending physicians at the Department of Lung Transplantation and CF, for their valuable support. Dr. Robinson took up work in a pneumology practice with Dr. Löschnhorn, and Dr. Marino is now senior staff physician of pneumology at Bürgerspital Solothurn. We would like to welcome their successors in Dr. Christine Rüegg and Dr. Fiorenza Gautschi, both of whom will be attending physicians for Lung Transplantation and CF.

#### 5.5. Liver transplantation

Prof. Dr. Philipp Dutkowski, Visceral Surgery

Prof. Dr. Beat Müllhaupt, Gastroenterology

In 2019, 64 liver transplantations were performed in Zurich (a total of 168 liver transplantations were performed in Switzerland), of which 23 were donations after circulatory death (DCD) and one was a living donor liver transplantation. All DCD livers are routinely optimized in Zurich by means of an ex vivo liver perfusion (Hypothermic Oxygenated Perfusion – HOPE).

#### 5.6. Kidney transplantation

Prof. Dr. Thomas Müller, Nephrology

Dr. med. Olivier de Rougemont, Visceral and Transplant Surgery

A total of 91 kidneys were transplanted at University Hospital Zurich in 2019. The collaboration with the referring nephrologists remains outstanding. We conducted referral meetings twice in the year (once at UHZ and once in Ticino) and these were very well received by our colleagues.

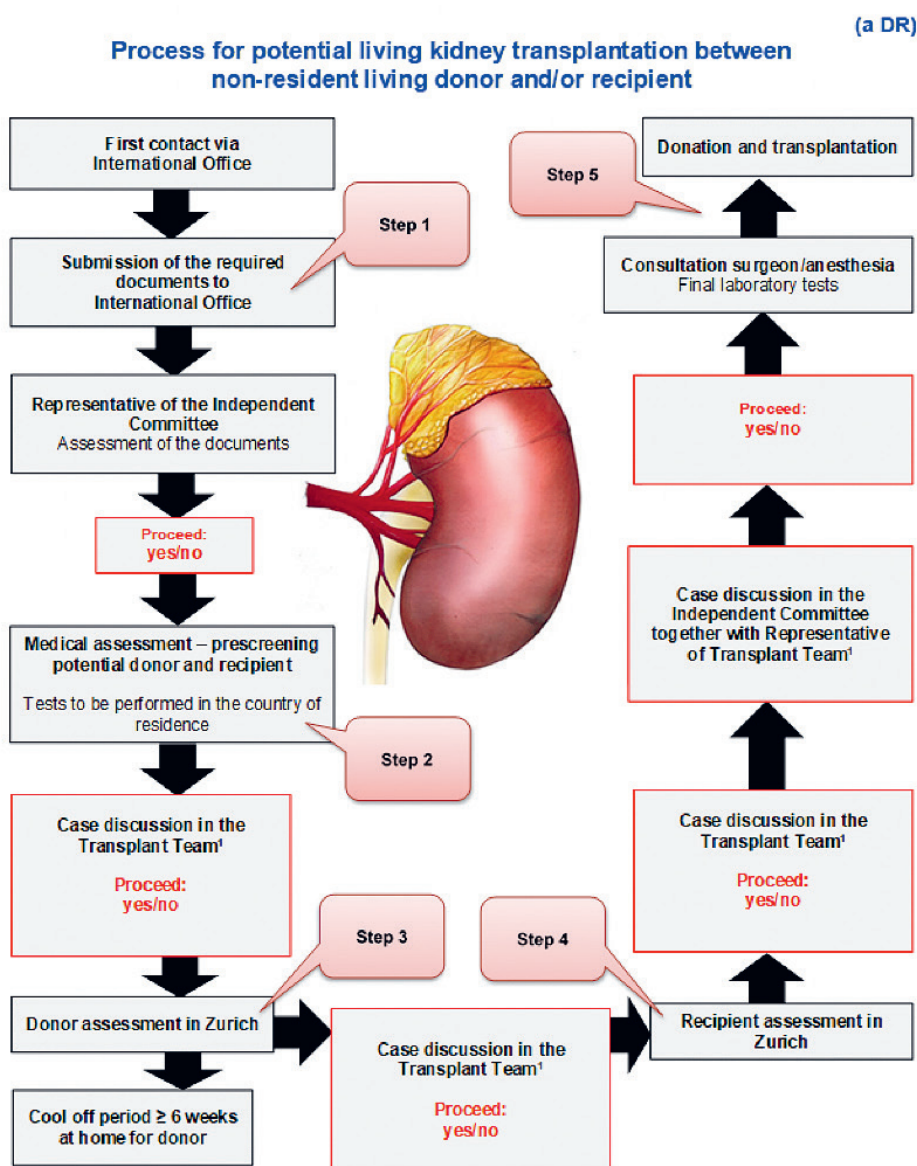
The Swiss Cross-Over Kidney Transplantation program (Kidney Paired Donation Switzerland KiPaDoS) was launched in 2019. Prof. Müller was largely responsible for drawing up the first nationwide guidelines for living kidney donors in this area. All six transplantation centers

in Switzerland took part in the first run on October 14, 2018, a total of 14 pairs were included. A cross-over donation and transplantation of a pair from UHZ was carried out with a pair from Bern on November 20, 2019. In total, 20 living donor kidney transplantations were carried out.

In collaboration with the International Office and Legal Services, an algorithm and the requisite documents for potential "non-resident" kidney transplant recipients and their donors were drawn up. These processes are particularly important for unrelated pairs in order to establish clarity and security vis-a-vis questionable organ trafficking.

For patients on the waiting list, we held two information evenings at the UHZ and one in Ticino. The events were each attended by approximately 100 participants and proved to be an effective platform for sharing experiences.

The findings from the transplantation program were also presented on national (SGN, STS) and international (ESOT) level.



## 5.7. Pancreas transplantation

Dr. med. Olivier de Rougemont, Department of Visceral and Transplant Surgery

In 2019, eight combined pancreas/kidney transplantations were performed. In European and US comparison, this corresponds to the volume of a medium-sized center for this kind of transplantation. All organs began functioning immediately, which confirms that surgical standards have remained high despite the decline in the case numbers. Much like for the singular kidney transplants, the team's stability is essential for achieving these good results.

## 5.8. Islet cell transplantation

Prof. Dr. Roger Lehmann, Endocrinology and Diabetology

### 5.8.1. Islet cell transplantation in the reporting year

In 2019, we only performed one combined islet cell and kidney transplantation. The potential reasons for the declining number of islet cell transplantations being carried out in Switzerland will be explained in more detail in the following sections.

### 5.8.2. New regulations for pancreas allocation

The new allocation regulations for pancreas and islet cell transplantation implemented by the Swiss FOPH in November 2017 have led to a standardization of the allocation of organs to patients on the waiting list for a beta cell replacement. Although patients waiting for an islet cell transplantation have in the past had to accept a longer waiting time, the number of islet cell transplantations did not increase, because most of the organs offered in recent years were considerably older and the donors were multi-morbid. Thanks to modern treatment methods for type-1 diabetes mellitus with continuous glucose measurement in combination with insulin pumps, the vast majority of patients no longer develop renal insufficiency that makes dialysis necessary, or only do so at an age when a transplant is not an option anymore.

### 5.8.3. Diabetes care

The interdisciplinary collaboration between the Department of Visceral and Transplant Surgery, the Department of Nephrology and the Department of Endocrinology in the Transplantation Center with regard to the care of islet cell or pancreas and kidney transplantations has been excellent for many years now. The different departments discuss and evaluate each patient together before placing them on the waiting list for the respective transplantation. The treatment is also based on the latest technology, with continuous blood sugar measurements and a sensor-equipped insulin pump that enables the hypoglycemia rate to be further reduced through the insulin

pump's predictive hypo-stoppage coupled with a glucose sensor. In addition, state-of-the-art semi-automatic insulin pumps (Medtronic 670G) that secrete insulin depending on the glucose levels measured by the glucose sensor and automatically increase insulin secretion when blood sugar levels are elevated, offer a much better way to control blood sugar. Blood sugar levels can be kept in the target range of 3.9–10 mmol/l much more reliably. The modern method of evaluating blood sugar levels comprises four factors. In addition to HbA1c, the rate of hypoglycemia being less than 3.0 mmol/l, and the abovementioned target range, variability is also crucial. All of these factors can be improved considerably with modern therapies. If these methods are applied at an early stage, subsequent complications can be avoided, which is increasingly observed throughout Switzerland in patients with type-1 diabetes mellitus.

### 5.8.4. Key aspects of the islet cell transplantation program in 2020/21

#### a) Autotransplantation of islet cells

Together with the Department of Gastroenterology (PD Dr. Ch. Gubler), more patients with chronic pancreatitis are to be informed about the possibility of a total pancreatectomy, which can eliminate the chronic pain that often leads to these patients being unable to work. The auto-transplantation of isolated islet cells from the person's own pancreas preserves the body's own ability to produce insulin. It is important to plan this operation at an early stage before the entire pancreas is worn out and too few pancreatic islets can be isolated. Following a pilot phase at the UHZ during which a number of autotransplantations will be carried out each year, information events shall be held at various hospitals to inform about this possibility, meaning that more referrals for this transplant procedure can be expected in the future.

#### b) Pseudo-islets

The project to optimize the production of pseudo-islets got off to a successful start. In collaboration with Kugelmeier (manufacturer of the "Spherical plate 5D" patented by us), the function of pseudo-islets (artificially separated and re-combined islets) will be investigated (i.e. their oxygen consumption and mitochondrial function). A clinical trial to improve transplant results by using pseudo-islets has already been fully planned and can be started once it has been approved by the Ethics Committee. It is a multi-center, randomized pilot study (being carried out in Leiden (NL), Lille (F), Dresden (D), Geneva and Zurich), in which the outcomes of conventional islet transplants will be compared with those of pseudo-islet transplants. If the safety of these plates can be demon-

strated for islet transplantation, they may also be available for stem cell transplantation.

## 5.9. Reconstructive transplantation

Prof. Dr. Jan Plock

The history of reconstructive transplantation is now approaching the 20-year mark since the first successful hand transplant. The success over the past two decades has shown that the functional and immunological outcome is generally good, and the long-term graft survival rate is even better than with solid organ transplantation. However, chronic rejection reactions with vascular alterations can also be observed in the long term course of vascularized composite allotransplantations. We are still pursuing the aim to achieve a stable course with minimal immunosuppression, since these are not life-saving transplantations.

On a research level at the University of Zurich, we continue to carry out experiments with national and international partners, focusing in particular on cell-based immunomodulation and the minimization of pharmacologically induced immunosuppression. We were the first group in the world to demonstrate an influence of mesenchymal stromal cells on the development of chronic rejection in allograft vessels. These results have since been confirmed in numerous studies and the survival rate has also been further improved through adjusting the immunosuppression.

Pranitha Kamat, PhD, was awarded the Science Award from the International Society of Vascularized Composite Allotransplantation for her deep learning project to identify vascular changes in the tunica intima within the development of vasculopathy. Riccardo Schweizer won the Science Award from Swiss Plastic Surgery for his research project on conditioning and immunotherapy with mesenchymal stem cells.

The launch of a program for hand and face transplantation with the Transplantation Center at the University Hospital Zurich was advanced in collaboration with the University of Pennsylvania in Philadelphia.

## Research funding

- Swiss National Science Foundation
- Hartmann Müller Foundation
- Gottfried und Julia Bangerter-Rhyner Foundation
- Brocher Foundation
- University of Zurich

## Publikationen

- Schweizer R, Taddeo A, Waldner M, Klein HJ, Fuchs N, Kamat P, Targosinski S, Barth AA, Drach MC, Gorantla VS, Cinelli P, Plock JA. Adipose-derived stromal cell therapy combined with a short course nonmyeloablative conditioning promotes long-term graft tolerance in vascularized composite allotransplantation. *Am J Transplant.* 2019 Nov 27.
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- Sutter D, Dzhonova DV, Prost JC, Bovet C, Banz Y, Rahnfeld L, Leroux JC, Rieben R, Vögelin E, Plock JA, Luciani P, Taddeo A, Schnider JT. Delivery of Rapamycin Using In Situ Forming Implants Promotes Immunoregulation and Vascularized Composite Allograft Survival. *Sci Rep.* 2019 Jun 25;9(1):9269.
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# 6 Annex

## 6.1. Staffing structure of the Transplantation Center 2019

	<b>Board of Directors</b>	<b>Board of Trustees</b>
<b>Management</b>	<b>Head</b> Prof. Nicolas Müller	<b>Chairman</b> Prof. Christian Benden
<b>Heart</b>	PD Dr. Andreas Flammer Prof. Markus Wilhelm	Prof. Frank Ruschitzka Prof. F. Maisano
<b>Lung</b>	Dr. Cécile Robinson PD Dr. Sven Hillinger	PD Dr. Christian Benden Prof. Walter Weder Prof. Dr. med. Ilhan Inci
<b>Liver</b>	Prof. Philipp Dutkowski vacant	Prof. Beat Müllhaupt Prof. Pierre-Alain Clavien
<b>Kidney</b>	Prof. Thomas Müller Dr. Olivier de Rougemont	Prof. Rudolf Wüthrich Prof. Pierre-Alain Clavien
<b>Pancreas and islet cells</b>	Prof. Roger Lehmann Dr. Olivier de Rougemont	Prof. Felix Beuschlein Prof. Pierre-Alain Clavien
<b>Small intestine and multi-visceral transplantation</b>	vacant	Prof. Pierre-Alain Clavien
<b>Stem cells</b>	PD Dr. Urs Schanz Dr. Antonia Müller	Prof. Markus Manz
<b>Reconstructive transplantations</b>	Prof. Dr. med. Jan Plock	
<b>Consultation services</b>	Prof. Nicolas Müller, Infektiologie Dr. Mirjam Nägeli, Dermatologie Dr. Andre Richter, Psychiatrie	Prof. Michael Weller
<b>Anesthesiology</b>	Prof. Marco Zalunardo	Prof. Donat Spahn
<b>Immunology/ HLA-Typing</b>	Dr. Jakob Nilsson, Ph.D	Prof. Onur Boyman
<b>Care</b>	Kuno Betschart	vakant
<b>Intensive care</b>	Dr. Stephanie Klinzing	Prof. Reto Schüpbach
<b>Transplant coordination</b>	Lea Kinteh-Vischherr	
<b>Research</b>	Prof. Rolf Graf	
<b>Data and Quality Manager</b>	Uschi Schäfer	
<b>Clinic Manager</b>	Karl-Heinz Heidenreich	
<b>Dean</b>		Prof. Dr. Rainer Weber

## International Advisory Board

<b>Heart</b>	Prof. Mandeep R. Mehra, USA
<b>Lungs</b>	Prof. John Dark, UK
<b>Liver</b>	Prof. Xavier Rogiers, Belgien
<b>Kidney</b>	Prof. Christophe Legendre, Frankreich
<b>Pancreas and islet cells</b>	Prof. Eelco de Koning, Niederlande
<b>Stem cells</b>	Prof. Ernst Holler, Deutschland
<b>Anesthesiology and intensive care</b>	Univ. Prof. Michael Hiesmayr, Österreich

## Local Advisory Board of the Transplantation Center

<b>Bellinzona</b>	Ospedale San Giovanni	Prof. Dr. med. Claudio Marone
<b>Chur</b>	Cantonal/Regional hospital	PD Dr. med. Reto Venzin
<b>Faltigberg-Wald</b>	Züricher Höhenklinik Wald	PD Dr. med. Matthias Hermann
<b>Frauenfeld</b>	Cantonal hospital	Dr. med. Markus Hugentobler
<b>Gais</b>	Klinik Gais AG	Dr. med. Angelika Bernardo
<b>Lucerne</b>	Cantonal hospital	Dr. med. Dominique Criblez
<b>Seewis</b>	Rehabilitation center	Dr. med. Willhard Kottmann
<b>St. Gallen</b>	Cantonal hospital	Dr. Dr. med. David Semela
<b>Winterthur</b>	Cantonal hospital	Dr. med. Thomas Kistler
<b>Zollikerberg</b>	Zollikerberg Hospital	Dr. med. Jörg Bleisch
<b>Zurich</b>	Waid Hospital	Prof. Dr. med. Patrice Ambühl

## 6.2. Transplantation Activities 2009–2019

Organ	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Heart total</b>	<b>9</b>	<b>12</b>	<b>14</b>	<b>11</b>	<b>10</b>	<b>16</b>	<b>14</b>	<b>10</b>	<b>17</b>	<b>16</b>	<b>11</b>
Heart and kidney	0	0	0	0	1	1	0	0	0	0	0
<b>Lung total</b>	<b>26</b>	<b>26</b>	<b>30</b>	<b>33</b>	<b>28</b>	<b>32</b>	<b>31</b>	<b>23</b>	<b>14</b>	<b>19</b>	<b>17</b>
– of which DCD	0	0	0	2	5	5	5	3	2	3	4
<b>Liver total</b>	<b>50</b>	<b>45</b>	<b>47</b>	<b>43</b>	<b>41</b>	<b>43</b>	<b>59</b>	<b>52</b>	<b>64</b>	<b>54</b>	<b>64</b>
NBHD	44	41	39	39	27	28	44	34	37	37	61
single-liver											
– of which DCD	0	0	1	3	9	12	12	6	21	12	22
Living donor liver	4	2	7	4	2	2	2	7	5	4	1
Liver and kidney	2	2	1	0	2	1	1	4	1	1	2
Liver and small intestine	0	0	0	0	1	0	0	1	0	0	0
<b>Kidney total</b>	<b>85</b>	<b>88</b>	<b>100</b>	<b>84</b>	<b>87</b>	<b>84</b>	<b>96</b>	<b>88</b>	<b>104</b>	<b>100</b>	<b>91</b>
NBHD	47	44	57	47	47	44	62	48	54	58	60
single-kidney											
– of which DCD	0	0	6	9	6	11	6	9	18	4	22
Living donor kidney	29	30	32	22	22	22	23	22	23	30	20
Kidney and pancreas	7	9	9	10	11	5	3	4	4	5	8
Kidney and islet cells	0	3	1	1	1	1	1	1	3	2	1
Kidney and heart	0	0	0	0	1	0	0	0	1	0	0
Kidney and liver	2	2	1	0	2	1	1	4	1	1	2
<b>Pancreas total</b>	<b>7</b>	<b>9</b>	<b>11</b>	<b>12</b>	<b>15</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>8</b>
Pancreas only	0	0	1	2	3	2	0	0	0	0	0
Pancreas and kidney	7	9	9	10	1	5	3	4	4	5	8
Pancreas/small intestine	0	0	1	0	1	0	0	0	2	0	0
<b>Islet cells total</b>	<b>5</b>	<b>9</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>1</b>
Islet cells only	5	6	5	4	4	5	2	4	2	0	0
Islet cells and kidney	0	3	1	1	1	1	1	1	3	2	1
<b>Small intestine multivisceral</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Stem cells total</b>	<b>–</b>	<b>119</b>	<b>147</b>	<b>128</b>	<b>139</b>	<b>151</b>	<b>150</b>	<b>150</b>	<b>148</b>	<b>174</b>	<b>168</b>
– autologous	not in	65	95	77	92	98	92	94	93	107	100
– allogeneic	TPLZ	54	52	51	47	53	58	56	55	67	68
	34										

Multi-organ donations	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>UHZ</b>											
<b>Donors from USZ</b>	<b>2</b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>18</b>	<b>17</b>	<b>24</b>	<b>14</b>	<b>23</b>	<b>17</b>	<b>33</b>
– of which DCD	0	0	3	6	9	12	12	4	17	5	16
<b>Donors from ZH network</b>	<b>10</b>	<b>3</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>9</b>	<b>10</b>	<b>13</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>Total donors UHZ plus network</b>	<b>12</b>	<b>10</b>	<b>12</b>	<b>19</b>	<b>24</b>	<b>26</b>	<b>34</b>	<b>27</b>	<b>31</b>	<b>26</b>	<b>43</b>



### 6.3. Outcome of organ transplantations

The results for all centers nationwide have been published since 2013. This is in accordance with the Transplantation Act and Ordinance. The report is publicly available at [www.stcs.ch](http://www.stcs.ch)

### 6.4. International Advisory Board (IAB) Meeting 2019

Nicolas Müller, Head of Transplantation Center

#### Minutes of the International Advisory Board Meeting 2019

Friday, November 15, 2019, 9 a.m. to 11 a.m.

Restaurant Im Turm, Zurich

Present:

*On behalf of IAB:* Prof. E. de Koning, Prof. C. Legendre

*Excused:* Prof. J. Dark, Prof. M. Hiesmayer,  
Prof. E. Holler, Prof. M.R. Mandeep, Prof. Xavier Rogiers

*On behalf of the Board of Trustees:* Prof. C. Benden,  
Prof. P.-A. Clavien, K.-H. Heidenreich, Prof. I. Inci,  
Prof. R. Lehmann (für Prof. F. Beuschlein), Prof. N. Müller,  
Prof. F. Ruschitzka, PD Dr. U. Schanz (für Prof. M. Manz),  
Prof. R. Schüpbach, Prof. M. Weller, Prof. M. Wilhelm  
Prof. R. Wüthrich

*Excused:* Prof. F. Beuschlein, Prof. O. Boyman, K. Bruni,  
Prof. P. Giovanoli, Prof. F. Maisano, Prof. M. Manz,  
Prof. B. Müllhaupt, Prof. D. Spahn, Prof. R. Weber

On behalf of the Board of Trustees, Christian Benden welcomes the members of the International Advisory Board.

The focus of the meeting is on donor development and the Transplantation Center Annual Report. The various programs are then briefly presented by the respective representatives, with comments from members of the IAB.

After the meeting, the IAB members are invited to a site visit of the respective programs and an exchange with the teams.

## 6.5. Scientific publications 2019

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7. Bögeholz J, Russkamp NF, Wilk CM, Gourri E, Haralambieva E, Schanz U, Mueller, NJ, Manz MG, Müller AMS. Long-Term Follow-Up of Antibody Titers Against Measles, Mumps, and Rubella in Recipients of Allogeneic Hematopoietic Cell Transplantation. *Biol Blood Marrow Transplant*. 2019 Nov 1. pii: S1083-8791(19)30709-8. doi: 10.1016/j.bbmt.2019.10.027. [Epub ahead of print] PubMed PMID: 31682977.
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## 6.6. Transplantation awards 2019

On the occasion of the fall symposium in November 2019, the Zurich Transplantation Center awards were held for the ninth time. The awards were once again generously sponsored by Astellas Pharma and were presented by Prof. Markus Wilhelm, member of the Board of Directors' Awards Committee. In addition to the awards for an experimental study, a clinical trial, and a merit award, a "lifetime achievement award" was also handed out this year.



### Clinical scientific award

**Dr. med. Peter W. Schreiber**

Metagenomic Virome Sequencing in Living Donor and Recipient Kidney Transplant Pairs Revealed JC Polyomavirus Transmission.



### Experimental scientific award

**Dr. med. Dilmurodjon Eshmuminov**

Life Outside of the Body.  
Novel Perfusion Technology Enabling one week ex vivo Preservation of Injured Human Livers.



### Merit award

**PD Dr. med. Urs Schanz**



### Lifetime Achievement Award

**Barbara Rüsi-Elsener**

Fast 30 Jahre mit Herzblut für die Organspende und Transplantation ("Almost 30 years of Passionate Commitment to Organ Donation and Transplantation" – Swisstransplant Magazine, No. 42, March 2020, pg. 10–12)

## 6.7. Professional development program 2019

### 6.7.1. Fall symposium 2019: "Organ donation"

#### Information


**When**  
Friday, November 15th, 2019  
12.15 – 17.30 h

**Location**  
University Hospital Zurich  
Great Lecture Hall East  
Gloriastrasse 29  
8091 Zurich


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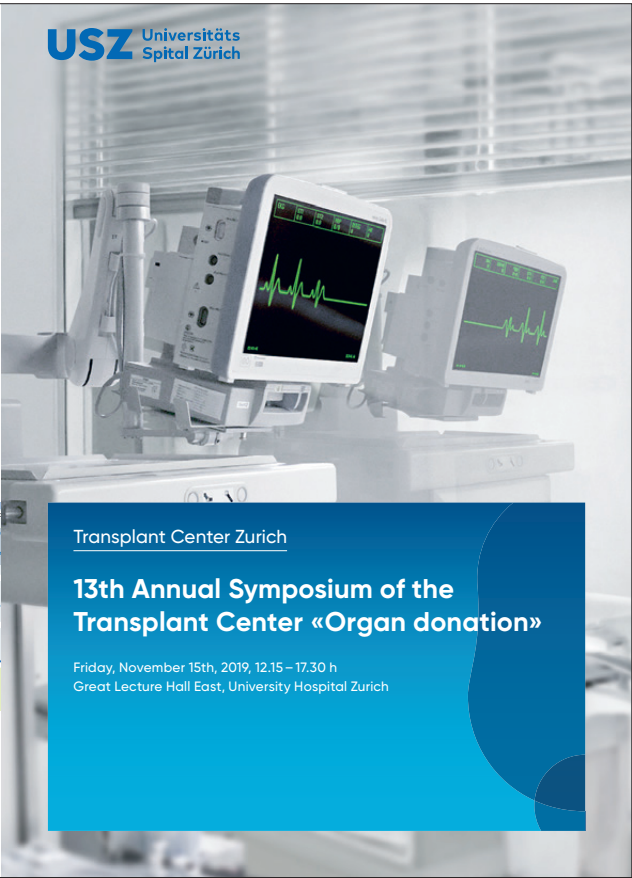
**Registration**  
Please e-mail your registration to [transplantationszentrum@usz.ch](mailto:transplantationszentrum@usz.ch)  
Or register online via [www.transplantation.usz.ch/symposium-2019](http://www.transplantation.usz.ch/symposium-2019)  
by Friday, November 8th 2019

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Transplant Center Zurich

### 13th Annual Symposium of the Transplant Center «Organ donation»

Friday, November 15th, 2019, 12:15 – 17:30 h  
Great Lecture Hall East, University Hospital Zurich



## Programm

- 12.15 h** **Buffet Lunch (Dick & Davy)**
- 13.30 h** **Welcome**  
Christian Benden
- 13.35 h** **Transplant Center Zurich: Annual Report**  
Nicolas Mueller
- Chair: Thomas Müller*
- 13.55 h** **Donation in Switzerland**  
Franziska Beyeler
- 14.20 h** **It's a precious gift?! Ethical Aspects of Donation**  
Tanja Krönes
- 14.40 h** **Organ Trafficking and Travel for Transplantation**  
Salomé Ryf
- 15.00 h** **Discussion**
- 15.15 h** **Coffee Break (Dick & Davy)**
- 15.45 h** **Awards Transplant Center Zurich**  
Markus Wilhelm, for the price committee
- Chair: Christian Benden*
- 16.05 h** **Novel Perfusion Technology Enabling one week ex vivo Preservation of Injured Human livers**  
Dilmurodjon Eshmuninov
- 16.20 h** **The Swiss National KPD program – here we are!**  
Thomas Müller
- 16.45 h** **Key note**  
**Living donation: what risk is too risky?**  
Aisling E. Courtney
- 17.25 h** **Summary**  
Christian Benden
- 17.30 h** **Apéro (Dick & Davy)**

## Chairs and Speakers

- Christian Benden, Prof. Dr.**  
Chairman Transplantation Center  
Senior Attending Physician  
Department of Pulmonology  
University Hospital Zurich
- Franziska Beyeler**  
Head of National Transplant Coordination  
Swisstransplant
- Aisling E. Courtney, Dr.**  
Clinical Lead for Transplantation  
Belfast City Hospital
- Dilmurodjon Eshmuninov, Dr. med. pract.**  
Research Fellow  
Division of Surgical Research  
University Hospital Zurich
- Tanja Krönes, Prof. Dr. med.**  
Senior Attending Physician  
Clinical Ethics  
University Hospital Zurich
- Nicolas Mueller, Prof. Dr.**  
Head Transplantation Centre  
Senior Attending Physician  
Department of Infectious Diseases  
University Hospital Zurich
- Thomas Müller, Prof. Dr.**  
Senior Attending Physician  
Department of Nephrology  
University Hospital Zurich
- Salomé Ryf, Dr. sc. nat.**  
Scientific Collaborator  
Division of Biomedicine  
Section Transplantation  
Federal Office of Public Health FOPH  
Federal Department of Home Affairs FDHA
- Markus Wilhelm, Prof. Dr.**  
Senior Attending Physician  
Department of Cardiovascular Surgery  
University Hospital Zurich

# TNT – Hot Topics in Transplantation

5.15 – 6.00 pm, kleiner Hörsaal OST, HOER B5

## Programm

- 25.03.2019 Ex vivo perfusion in lung transplantation – current experiences**  
Prof. Dr. Clemens Aigner  
Director, Department of Thoracic Surgery  
Ruhrlandklinik – West German Lung Centre  
University Hospital Essen  
Host: PD Dr. Sven Hillinger
- 29.04.2019 Humorale Abstossung bei verschiedenen Organen: Was ist gleich, was ist anders?**  
Prof. Dr. Thomas Müller  
Leitender Arzt  
Klinik für Nephrologie  
UniversitätsSpital Zürich  
Host: Prof. Dr. Thomas Müller
- 24.06.2019 Die neuen CMV-Medikamente: Wann und wie sollen sie eingesetzt werden?**  
Univ.-Prof. Dr. Oliver Cornely  
Oberarzt, Klinik für Innere Medizin, Uniklinik Köln  
Professur für Translationale Forschung am CECAD  
Akademische Leitung des ZKS Köln  
Host: PD Dr. Urs Schanz
- 26.08.2019 Immunadsorption in der Transplantationsmedizin und bei Autoimmunerkrankungen**  
PD Dr. med. Behrouz Mansouri Taleghani  
Leitender Arzt, Leitung therapeutische Hämapherese  
Inselspital, Universitätsspital Bern  
Host: Prof. Dr. Thomas Müller
- 30.09.2019 Donor Management in the ICU**  
KD Dr. med. Peter Steiger  
Stv. Institutsleiter  
Institut für Intensivmedizin  
UniversitätsSpital, Zürich  
Host: Prof. Dr. Nicolas Müller
- 28.10.2019 Chronische Abstossung nach Lungentransplantation (CLAD) – neue Klassifikation, neue Hoffnung?!**  
Prof. Dr. Jens Gottlieb  
Oberarzt, Bronchoskopie und Transplantation  
Klinik für Pneumologie  
Medizinische Hochschule Hannover  
Host: Prof. Dr. Christian Benden

### Organisation

PD Dr. Sven Hillinger  
Prof. Dr. Roger Lehmann  
Prof. Dr. Nicolas Müller  
PD Dr. Urs Schanz  
Prof. Dr. Thomas Müller

### Auskunft

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Für die einzelnen Veranstaltungen werden  
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