
# Transplantation -

## Zukunft und Perspektiven

**Günter Kirste**

gkirste@web.de

- doch etwas zur „Historie“
- Perfusion / Protektion
- VCA vascular combined allografts
- Technische Herausforderungen
- Neue Therapien
- Immunologische Veränderungen
- Gentechnik / Regenerative Medicine
- Züchtung von Organen
- Todesfeststellung
- Ethische Herausforderungen

# Transplantationszentrum Freiburg

1968 - 2018

| | |
|---|---|
| . Nierentransplantationen | 3830 |
| . Nierenlebendspenden | 471 |
| . Nierentransplantationen bei Kindern | 173 |
| . Nierenlebendspenden ABO i | 133 |
| . Lebertransplantationen | 131 |
| . Pankreas- / Nierentransplantationen | 141 |
| . Herztransplantationen | 348 |
| . Lungentransplantationen | 180 |

# 1. NTx

1. Erfolgreiche Nierentransplantation in Boston am 23.12.1954 Spender: eineiiger Zwillingsbruder

**1954**


1. **Mrs. Maxine Rhodes** – Scrub Nurse
2. **Daniel Edgar Pugh** – Surgical Intern
3. **Joseph Edward Murray** – Transplant Surgeon
4. **John Loring Rowbotham** – Chief Resident Surgeon
5. **Edward Barton Gray** – Surgical Resident
6. **Mrs. Elizabeth Comiskey** – Circulating Nurse
7. **Francis Daniels Moore** – Chief of Surgery
8. **Extra Scrub Nurse** – Fictional
9. **Richard Herrick** – Recipient Patient
10. **Leroy David Vandam** – Anesthesiologist
11. **John Hartwell Harrison** – Urological Surgeon
12. **Gustave John Dammin** – Chief Pathologist
13. **John Putnam Merrill** – Nephrologist
14. **George Widmer Thorn** – Chief of Medicine

a. **Miss Alice Maxwell** – Scrub Nurse

b. **John Hartwell Harrison** – Urological Surgeon, shown again

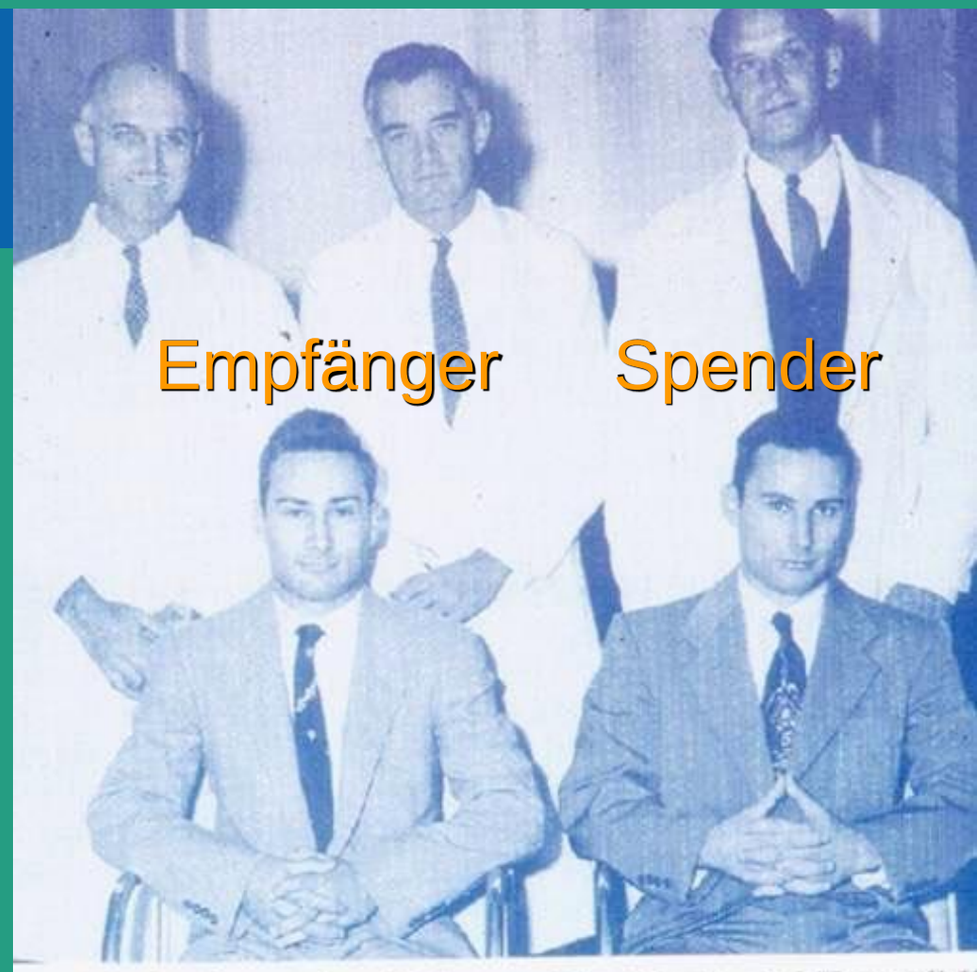
c. **Miss Marian Wheet** – Circulating Nurse

d. **Robert Austin Milch** – Junior Surgical Resident

e. **Murray Benjamin Pincus** – Chief Resident, Urology

f. **Charles Peter Crowe** – Surgical Intern, Anesthesia Rotation

g. **Thomas Kelvin Burnap** – Anesthesiologist




to right, back row: Joseph Murray, John Merrill, and Hartwell H
n. Front row, the Herrick twins: Richard (left), recipient, and Ron
or.

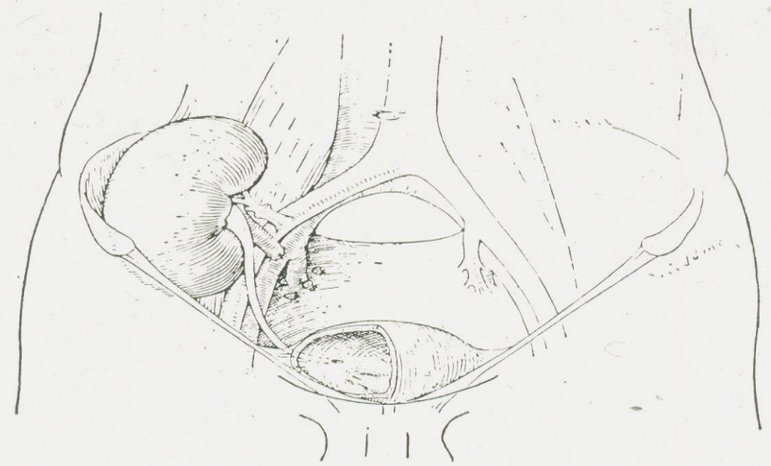
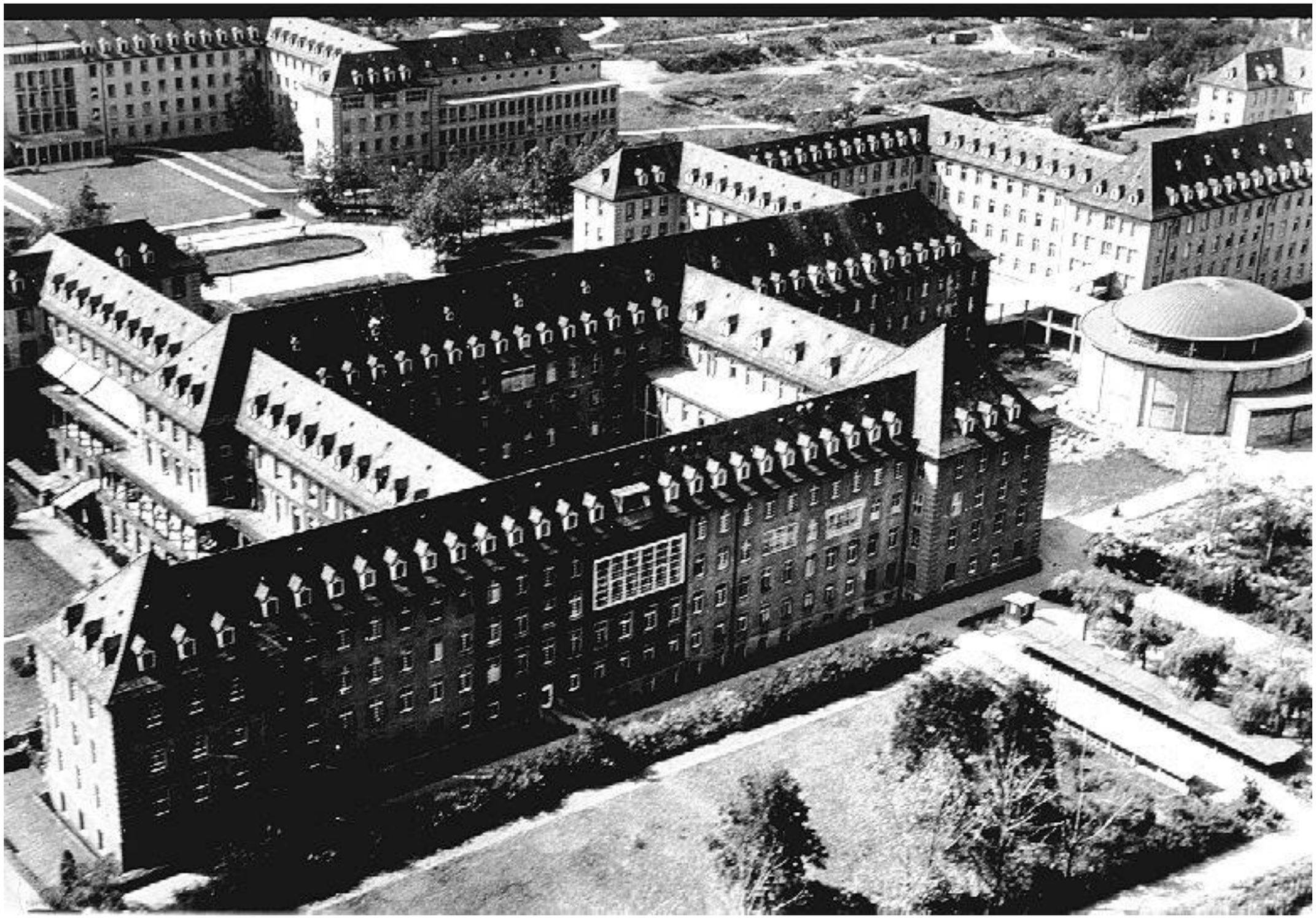


Fig. 2.—Schematic diagram of renal homograft in situ showing vascular anastomoses completed and ureter implanted in bladder. Renal artery end-to-end with hypogastric; renal vein end-to-side with common iliac; ureter mucosa-to-mucosa anastomosis with bladder.

John P. Merrill et al.
J.A.M.A., 1956



# THE USE OF ANTIGENIC TISSUE EXTRACTS TO WEAKEN THE IMMUNOLOGICAL REACTION AGAINST SKIN HOMOGRAFTS IN MICE

P. B. MEDAWAR

*National Institute for Medical Research, London N.W.7, U.K.*

SUMMARY

1. A crude semi-soluble extract of A-strain lymphoid tissues will sensitize C3H mice to A-strain skin grafts when given i.p., but not when given i.v. Intravenous injection of semi-soluble antigen sometimes prolongs the life of homografts. 2. Both its physical form and its route of entry determine whether or not a given antigenic preparation from A-strain mice will sensitize C3H mice. Sensitization is least effective when the i.v. route is used, but antigen in a particulate form will sensitize even when given i.v. and antigen in a soluble form will not sensitize even when given i.p. 3. In the combination C3H → CBA, chosen to typify a weak histocompatibility system, both soluble and particulate antigenic extracts prolong the life of homografts in adult mice when administered in adequate doses through i.v., i.p., or subdermal routes. 4. Antigens administered in such a form or in such

1963

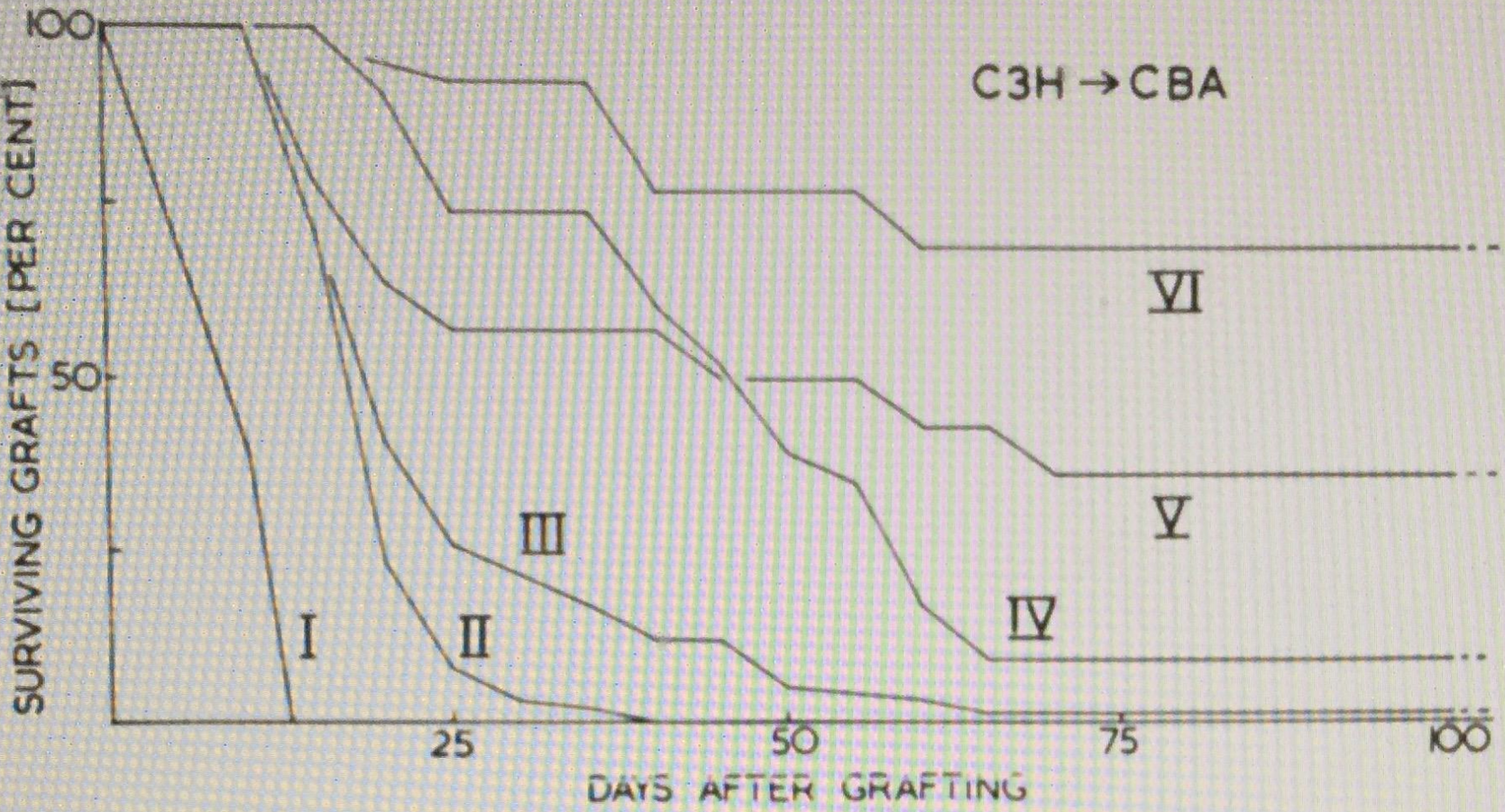



FIG. 2. Survival curves of C3H skin grafts on CBA mice that had received: I. An earlier skin graft. II. No treatment. III. 200 units of C3H antigen in various forms and by various routes. IV. 200 units of C3H antigen followed by one 20 mg/kg dose of a-methopterin. V. 450 roentgens whole body irradiation. VI. 450 roentgens whole body irradiation followed by 200 units of crude semi-soluble antigen i.v.

soluble form at pH 7.5 to 7.6. The results of 55 such experiments are shown in Table 1 (entry 2) and Fig. 1 (graph III). The mean expectation of life was 13.1 days ± 0.7 days standard error, a figure significantly higher ($p < 0.02$) than the corresponding value from the controls (see section 3.1); 36% of the grafts

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# RENAL HETEROTRANSPLANTATION FROM BABOON TO MAN: EXPERIENCE WITH 6 CASES[1]

T. E. STARZL,[2] T. L. MARCHIORO, G. N. PETERS, C. H. KIRKPATRICK,[3] W. E. C. WILSON,[4] K. A. PORTER, D. RIFKIND, D. A. OGDEN, C. R. HITCHCOCK, W. R. WADDELL

*Departments of Surgery and Medicine, University of Colorado School of Medicine and Denver Veterans Administration Hospital, Denver; Department of Pathology, St. Mary's Hospital Medical School, London; and Department of Surgery, Hennepin County General Hospital, Minneapolis*

## SUMMARY

Six patients with terminal uremia due to glomerulonephritis or pyelonephritis were treated with heterografts from East African ba-

1964

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# SEROTYPING FOR HOMOTRANSPLANTATION V. EVALUATION OF A MATCHING SCHEME[1]

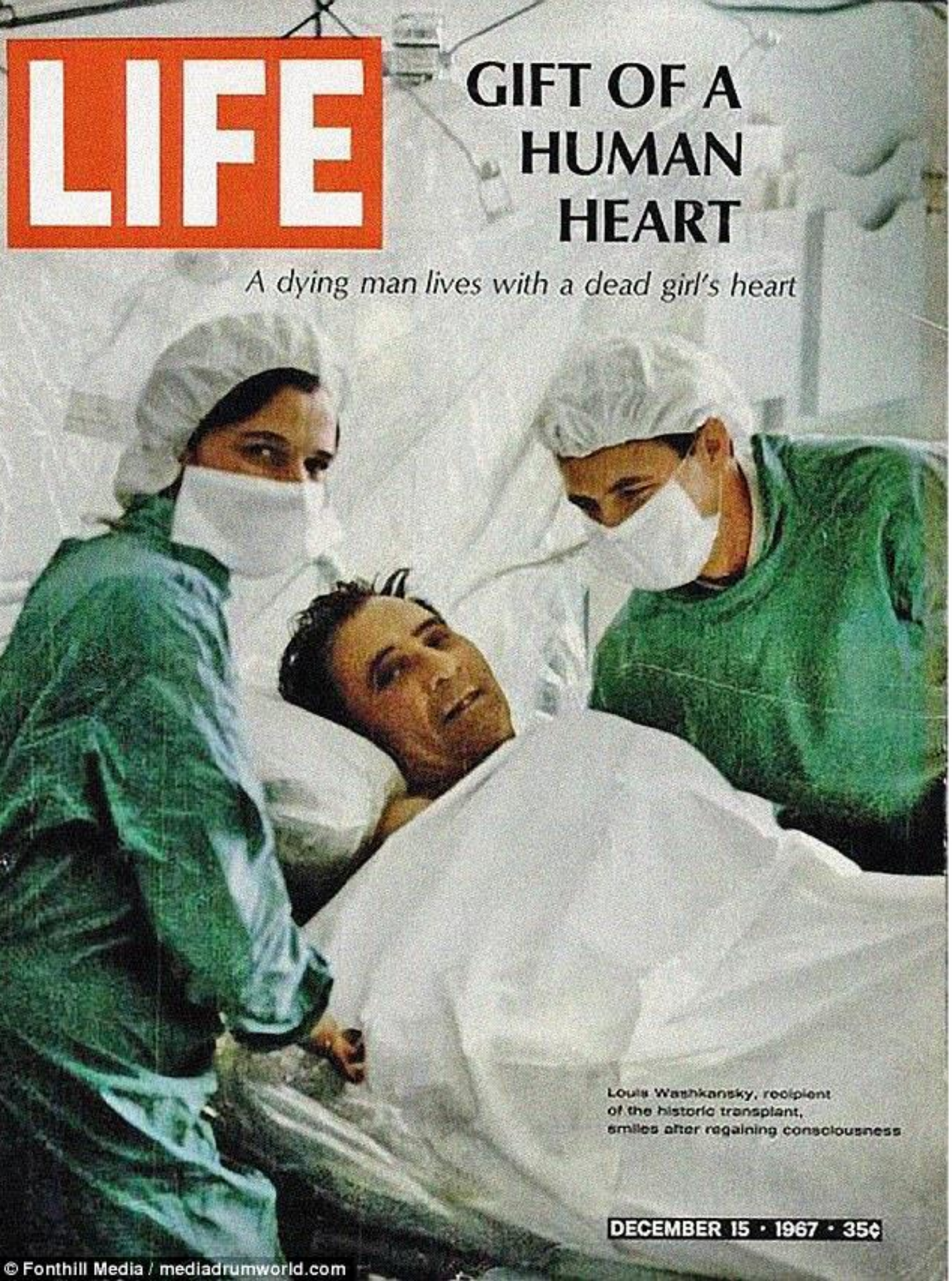
P. I. TERASAKI, D. L. VREDEVOE, K. A. PORTER[2], M. R. MICKEY[3], T. L. MARCHIORO[4], T. D. FARIS[4], T. J. HERRMANN[4], AND T. E. STARZL[4]

*Departments of Surgery and Preventive Medicine and Public Health, School of Medicine, University of California, Los Angeles, the Department of Pathology, St. Mary's Hospital, London, England, the Department of Surgery, School of Medicine, University of Colorado, and the Veterans Administration Hospital, Denver, Colorado*

## SUMMARY

An attempt was made to determine whether 36 long-term kidney homograft recipients and their donors were compatible for 7 major leukocyte groups. It was found that 21 of these recipients were surviving 2 to 3 years in spite of incompatibility for 1 or 2 major leukocyte

1966






1967

The results of experiment A are given in Figure 1 and Table 1. Treatment with CYA produced a median survival of over 43

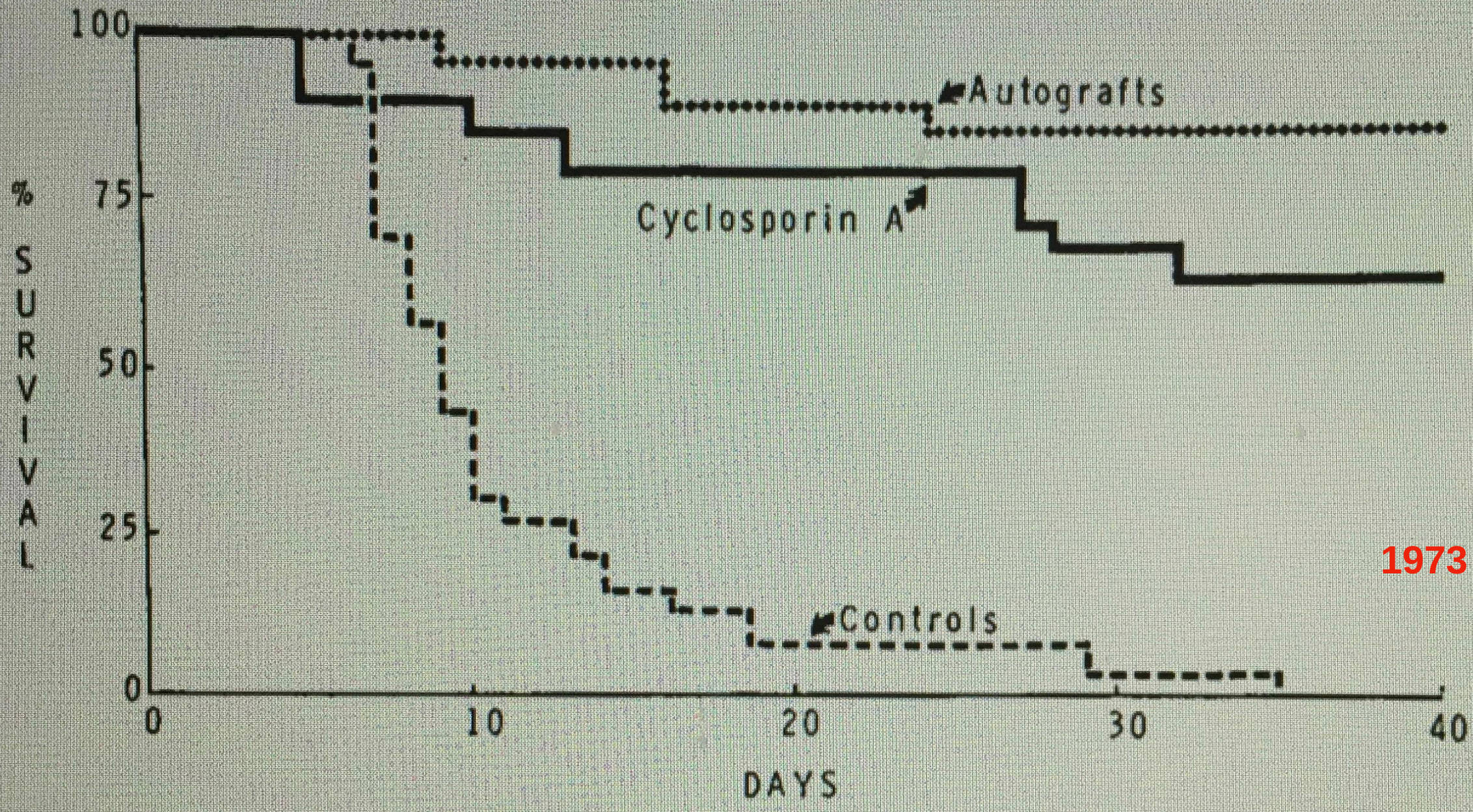



FIGURE 1. Comparative survival times of 26 autografts, 23 untreated allograft controls, and 22 allografts treated with Cyclosporin A.

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# HL-A AND KIDNEY TRANSPLANTS: REEXAMINATION[1]

G. OPELZ, M. R. MICKEY, AND P. I. TERASAKI

*Departments of Surgery and Biomathematics, School of Medicine, University of California, Los Angeles, California 90024*

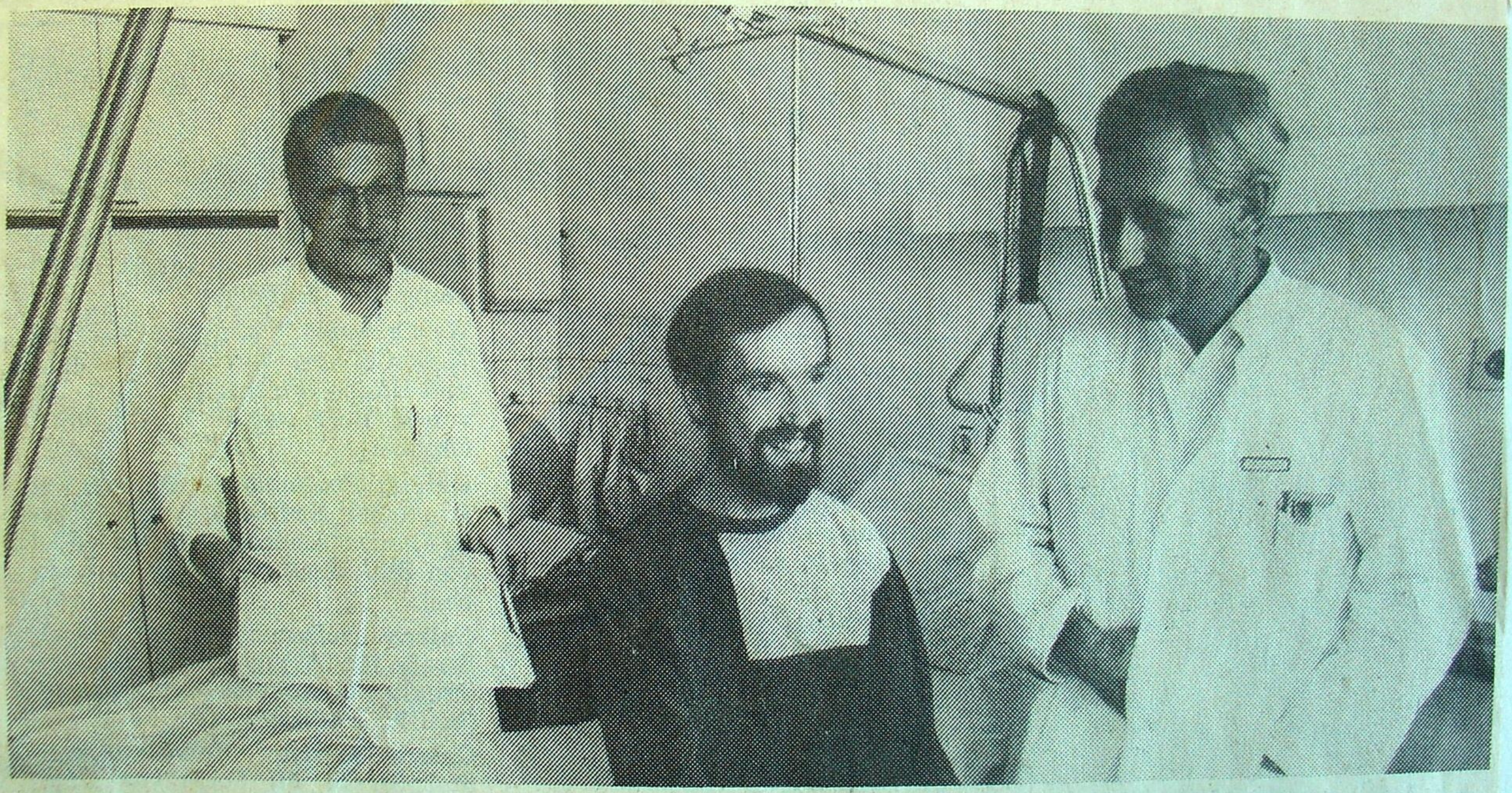
## SUMMARY

Graft survival was analyzed in over 3,000 human kidney transplants performed between 1969 and 1972, with respect to histocompatibility. The most significant factors on graft survival were found to be HL-A haplotype differences, unresponsiveness to HL-A, and presensitization to HL-A. In cadaver donor transplants, HL-A antigen differences (HL-A matching) seemed to be of some influence, although not of statistical significance; no substantial improvement was obtained when cross reactivity and homozygosity were considered. Contrary to the reports of others, second locus antigens were not more significant than the first locus antigens. The HL-A type of the recipient and mismatches for different HL-A specificities were not found to be factors of major influence on graft survival. For cadaver kidney transplantation, immune responsiveness to HL-A as measured by antibody production to HL-A was the most consistent factor influencing survival of transplants.

1974

Dienstag, 25. September 1984 / Nr. 223

Freiburger Zei



**ZUM 500. MAL wurde in der Freiburger Universitätsklinik eine Niere verpflanzt. Empfänger der Niere war der 27 Jahre alte Klaus Petermann (unser Bild Mitte). Der Patient fühlt sich wenige Tage nach dem Eingriff bereits wieder recht wohl und kann das Bett schon für kurze Zeit verlassen. Das Bild zeigt neben dem Patienten den Leiter des Freiburger Transplant-Teams, Oberarzt Horst Wilms (rechts) und Günther Kirste, der in diesem Fall operiert hat.** Bild: Wurzer

# 500. Niere in Freiburg transplantiert

1984

0041-1337/92/5302-0428$03.00/0
TRANSPLANTATION

Vol. 53, 428–432, No. 2, February 1992
*Printed in U.S.A.*

# RS-61443—A PHASE I CLINICAL TRIAL AND PILOT RESCUE STUDY[1]

HANS W. SOLLINGER,[2] MARK H. DEIERHOI,[3] FOLKERT O. BELZER,[4] ARNOLD G. DIETHELM,[3] AND ROBERT S. KAUFFMAN[5]

*The Department of Surgery, University of Wisconsin School of Medicine, Madison, Wisconsin 53792; The Department of Surgery, University of Alabama—Birmingham, Birmingham, Alabama 35294; and Syntex Research, Palo Alto, California 94304*

**RS-61443, a morpholinoethyl ester of mycophenolic acid, inhibits the synthesis of guanosine monophosphate, which plays a pivotal role in lymphocyte metabolism. The drug blocks proliferative responses of T and B lymphocytes, and inhibits antibody formation and the generation of cytotoxic T cells. In vivo, RS-61443 prolongs the survival of islet allografts in mice, heart allografts in rats, and kidney allografts in dogs. Reversal of ongoing acute rejection was demonstrated in rat heart allografts and kidney allografts in dogs. Preliminary evidence suggests that the drug prevents chronic rejection.**

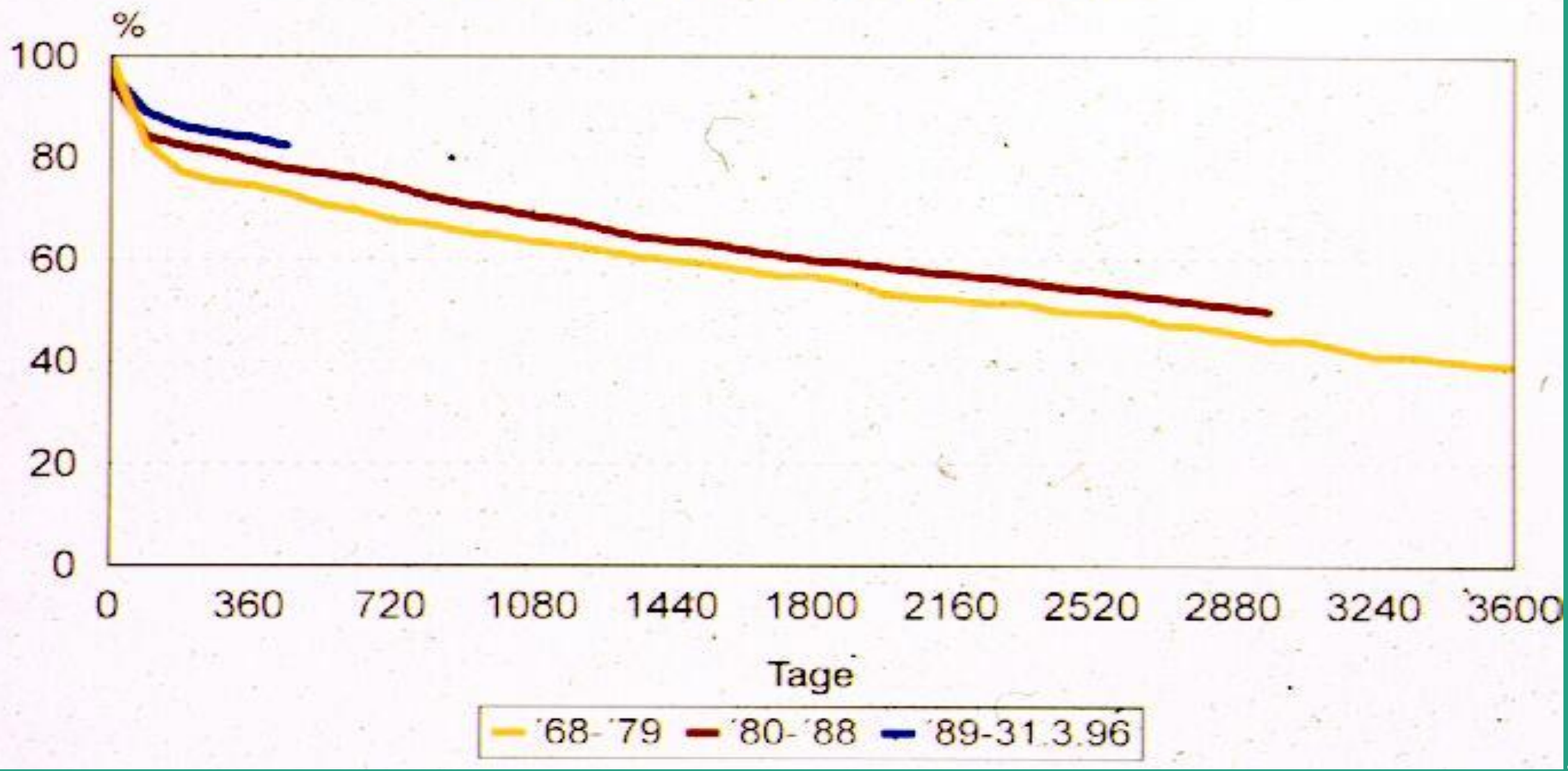
**The purpose of this study was to test the safety and tolerance in patients receiving primary cadaver kidneys. RS-61443 in doses from 100 mg/day p.o. to 3500 mg/day p.o. was given to patients in combination with**

sis, whereas other cell types do not, antiproliferative effects produced in this way are more selective for lymphocytes than other cell types. RS-61443, the morpholinoethyl ester of MPA synthesized by Dr. Peter Nelson (Syntex) was found to have improved bioavailability as compared with MPA (*1*). The drug blocks proliferative responses of T and B lymphocytes (*2*) and inhibits antibody formation (*3*) and the generation of cytotoxic T cells (*3*). In vivo monotherapy with RS-61443 was shown to prolong the survival of heart allografts in rats (*4*), and islet allograft survival in mice (*5*). When combined with low doses of cyclosporine (5 mg/kg) and prednisone (0.1 mg/kg), RS-61443 significantly prolonged the survival of renal allografts in mongrel dogs (*6*). Furthermore, RS-61443 has the ability to reverse ongoing acute allograft rejection in a rat heart allograft model (*4*) and in mongrel dogs who received unmatched kidney

1992

# Funktionsraten im Vergleich

´68-´79, ´80-´88, ´89-31.3.96



0041-1337/02/7410-1377/0
TRANSPLANTATION

Vol. 74, 1377–1381, No. 10, November 27, 2002
*Printed in U.S.A.*

# WAITING TIME ON DIALYSIS AS THE STRONGEST MODIFIABLE RISK FACTOR FOR RENAL TRANSPLANT OUTCOMES

## A PAIRED DONOR KIDNEY ANALYSIS[1]

HERWIG-ULF MEIER-KRIESCHE[2,3] AND BRUCE KAPLAN[2]

***Background.*** **Waiting time on dialysis has been shown to be associated with worse outcomes after living and cadaveric transplantation. To validate and quantify end-stage renal disease (ESRD) time as an independent risk factor for kidney transplantation, we compared the outcome of paired donor kidneys, destined to patients who had ESRD more than 2 years compared to patients who had ESRD less than 6 months.**

***Methods.*** **We analyzed data available from the U.S. Renal Data System database between 1988 and 1998 by Kaplan-Meier estimates and Cox proportional hazards models to quantify the effect of ESRD time on paired cadaveric kidneys and on all cadaveric kidneys compared to living-donated kidneys.**

***Results.*** **Five- and 10-year unadjusted graft survival rates were significantly worse in paired kidney recipients who had undergone more than 24 months of dialysis (58% and 29%, respectively) compared to paired kidney recipients who had undergone less than 6**

tive renal transplant recipients were doing significantly better than patients who had undergone longer periods of maintenance dialysis (*1*, *2*). These studies, however, could not exclude the potential selection bias of lower risk patients who obtain preemptive transplants and, therefore, could not directly implicate dialysis as a causal factor for the worse graft survival in transplants after maintenance dialysis. Evidence that time on dialysis in itself conferred a higher risk for graft loss after transplantation came initially from a single-center study by Cosio et al. who showed that increased time on dialysis before transplantation was associated with decreased patient and graft survival (*3*). The argument that time on dialysis itself is an independent risk factor for graft loss was strengthened by a subsequent retrospective study that was based on U.S. Renal Data System (USRDS) data that showed a clear dose effect of the detrimental effect of dialysis time on transplant outcomes not only for patient and graft survival but somewhat surprisingly also for death-censored graft survival in both cadaveric and living transplan-

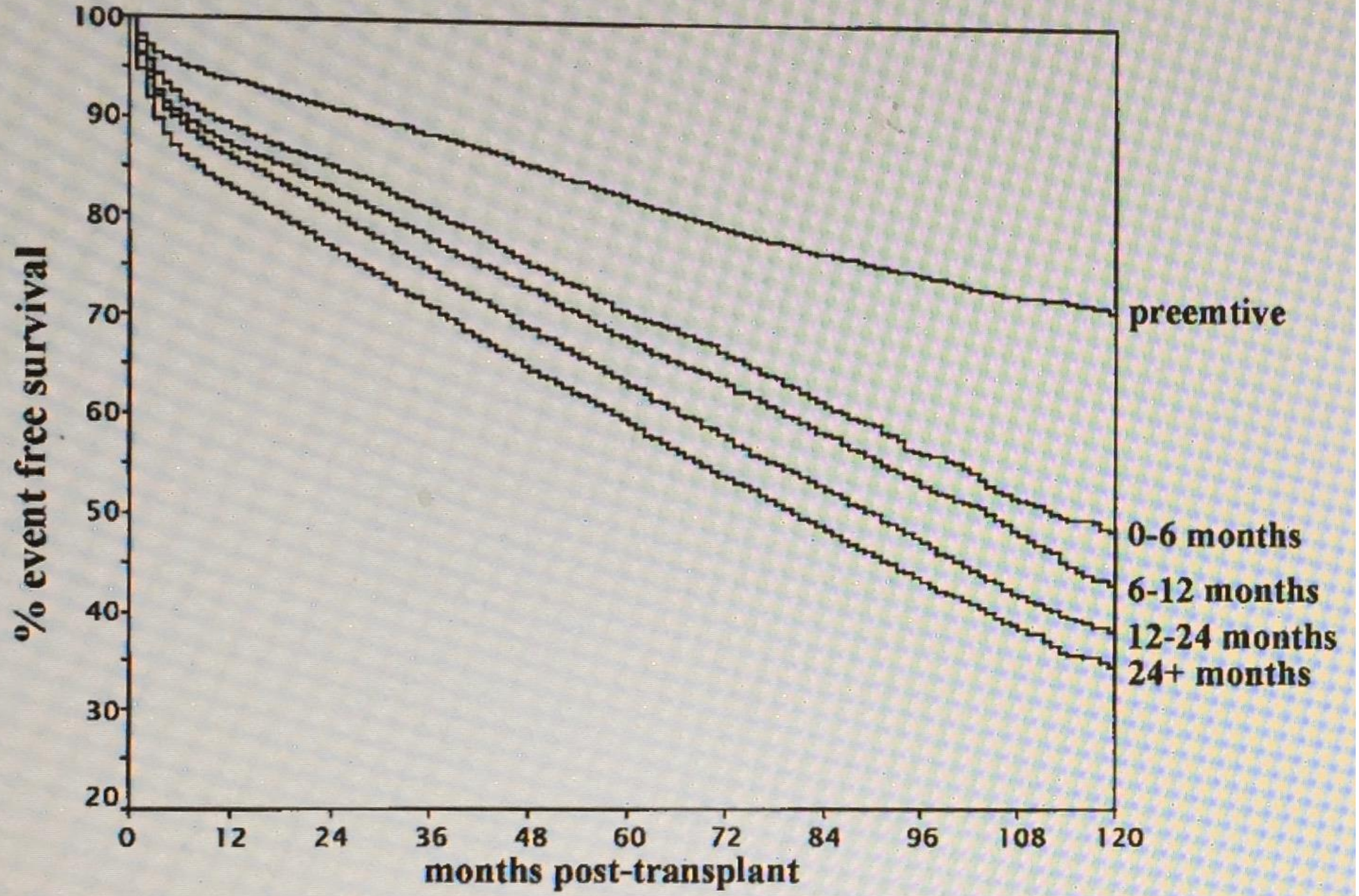



**FIGURE 2. Unadjusted graft survival in 56,587 recipients of cadaveric transplants by length of dialysis treatment before transplant.**

2002

0041-1337/80/2902-0153$02.00/0
TRANSPLANTATION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# DOMINANT EFFECT OF TRANSFUSIONS ON KIDNEY GRAFT SURVIVAL[1]

GERHARD OPELZ[2] AND PAUL I. TERASAKI

*Department of Surgery, UCLA School of Medicine, University of California, Los Angeles, California 90024*

SUMMARY

The number of pretransplant blood transfusions influences the graft survival of cadaver kidney transplants more than HLA-A and B matching, preformed lymphocytotoxic antibodies, or center variation. At 1 year the graft survival rate in patients with more than 20 packed cells transfusions was over 30% higher than that in nontransfused recipients (75 ± 5% versus 41 ± 2%, $P < 0.0001$). Recipients with one packed cell transfusion had a 59 ± 5% 1-year graft survival rate. Frozen blood and any transfusions given at the time of surgery were relatively ineffective. Pretransplant pregnancies had no significant effect on graft outcome. The improvement effect of transfusions was significant in each of the last four calendar years (1975, $P < 0.001$; 1976, $P < 0.01$; 1977, $P < 0.0001$; 1978, $P < 0.0001$). Yet, the percentage of nontransfused recipients has remained almost unchanged over the years. A preliminary survey of transplants done from January to April 1979 showed that one-third of the recipients had not been transfused. A change in transfusion policy is indicated to improve the results of cadaver kidney transplantation.

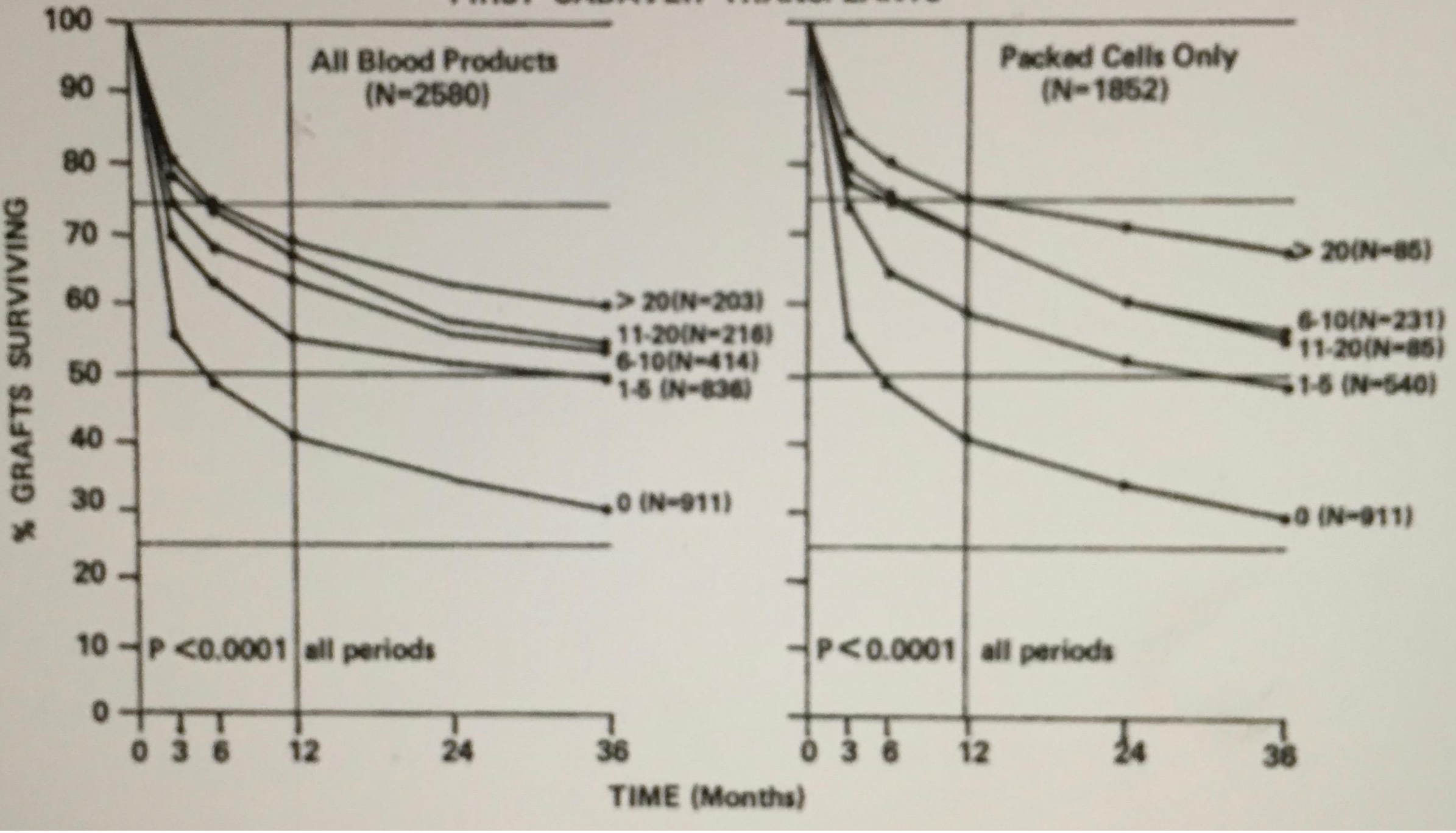
The beneficial effect of pretransplant blood transfusions on transplants done between January 1971 and December 1978 were included. Graft survival rates were computed by actuarial methods and are expressed as percentage ± SE (*5*). Statistical significance was calculated by weighted regression analysis (*6*) or by Student's *t* test method. Technical or nonimmunological failures were not excluded.

## RESULTS

The powerful improvement effect of increasing numbers of transfusions on graft survival was evident in the entire series of 2,580 recipients, and even more clearly in a subset of 1,852 recipients who had received only packed cell transfusions (Fig. 1). With packed cell transfusions the difference in the graft survival rates between patients with 0 or >20 units of blood was 34% at 1 year (41 ± 2% versus 75 ± 5%, $P < 0.0001$ by Student's *t* test). The graft survival rates in the intermediate groups were 58 ± 2% in patients with 1 to 5 transfusions, 70 ± 3% in patients with 6 to 10 transfusions, and 70 ± 5% in patients with 11 to 20 transfusions (1 to 5 versus >20 transfusions, $P < 0.001$; 6 to 10 or 11 to 20 versus >20 transfusions, *P* nonsignificant).

# TRANSPLANTATION

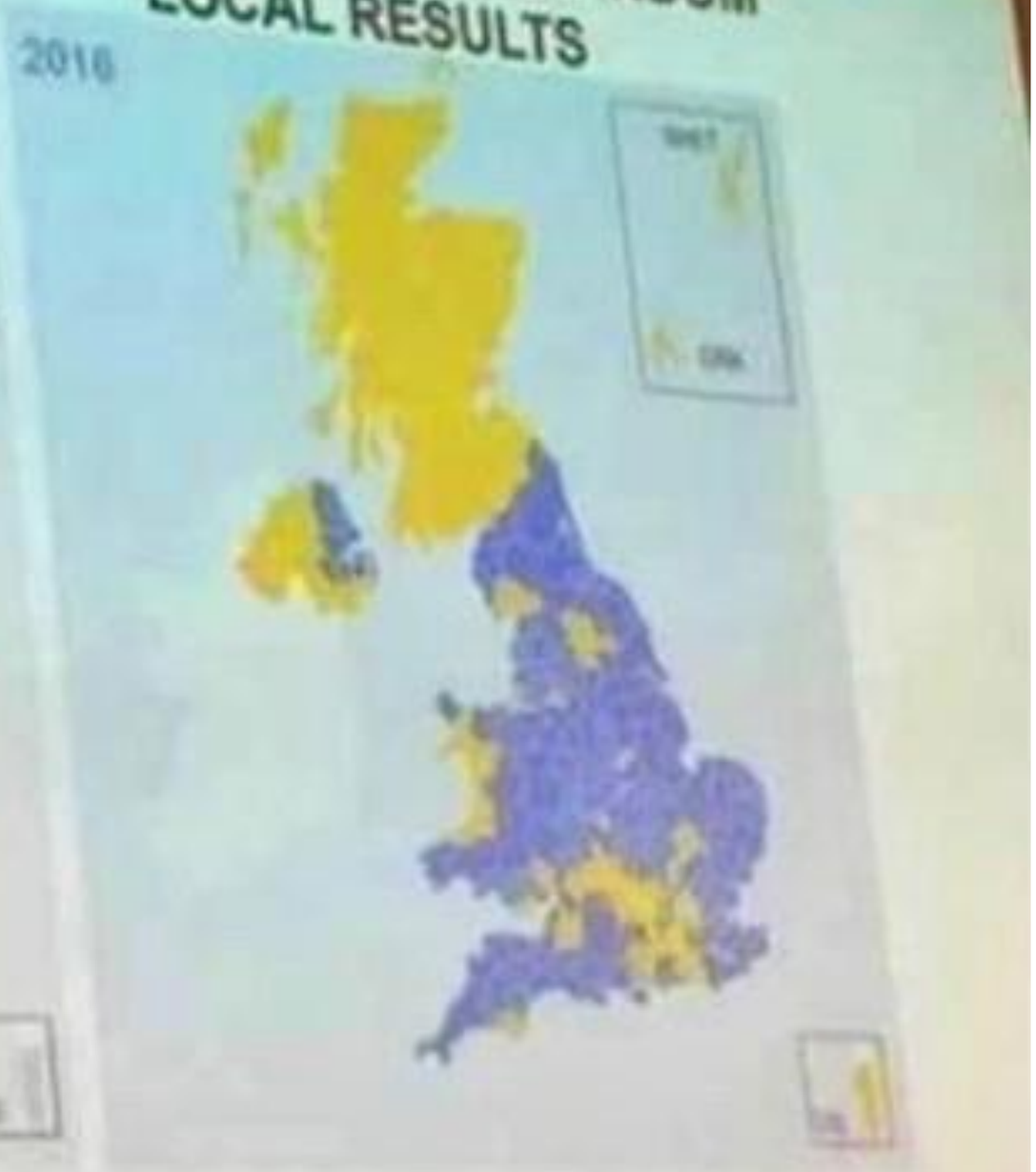
## PRETRANSPLANT TRANSFUSIONS
## FIRST CADAVER TRANSPLANTS




1980

## 1992 – MAD COW DISEASE OUTBREAK AREAS


## 2016 – BREXIT REFERENDUM LOCAL RESULTS

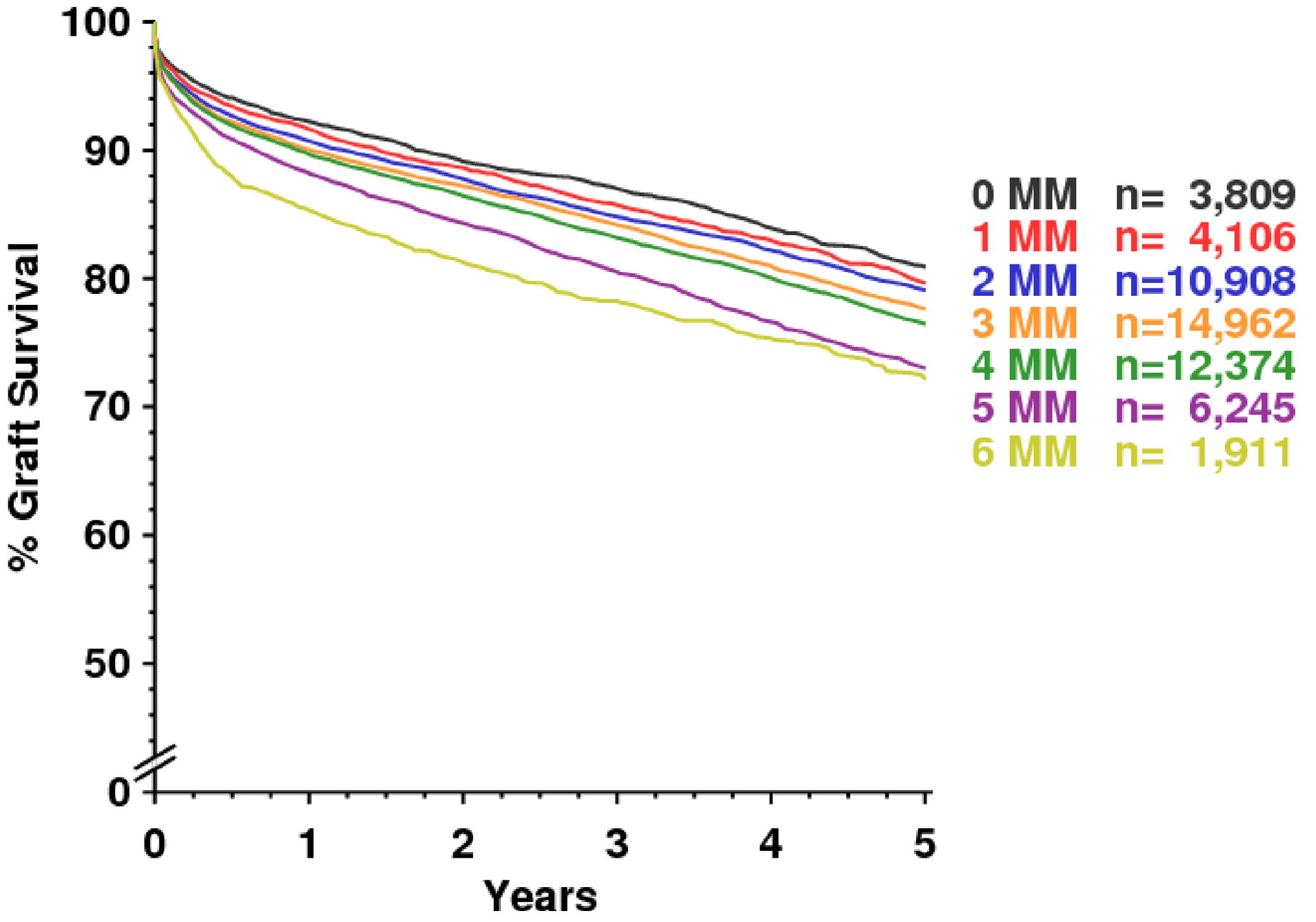



## IT MAY, HOWEVER, BE A MISTAKE TO JUMP TO CONCLUSIONS

# Perfusion / Protektion

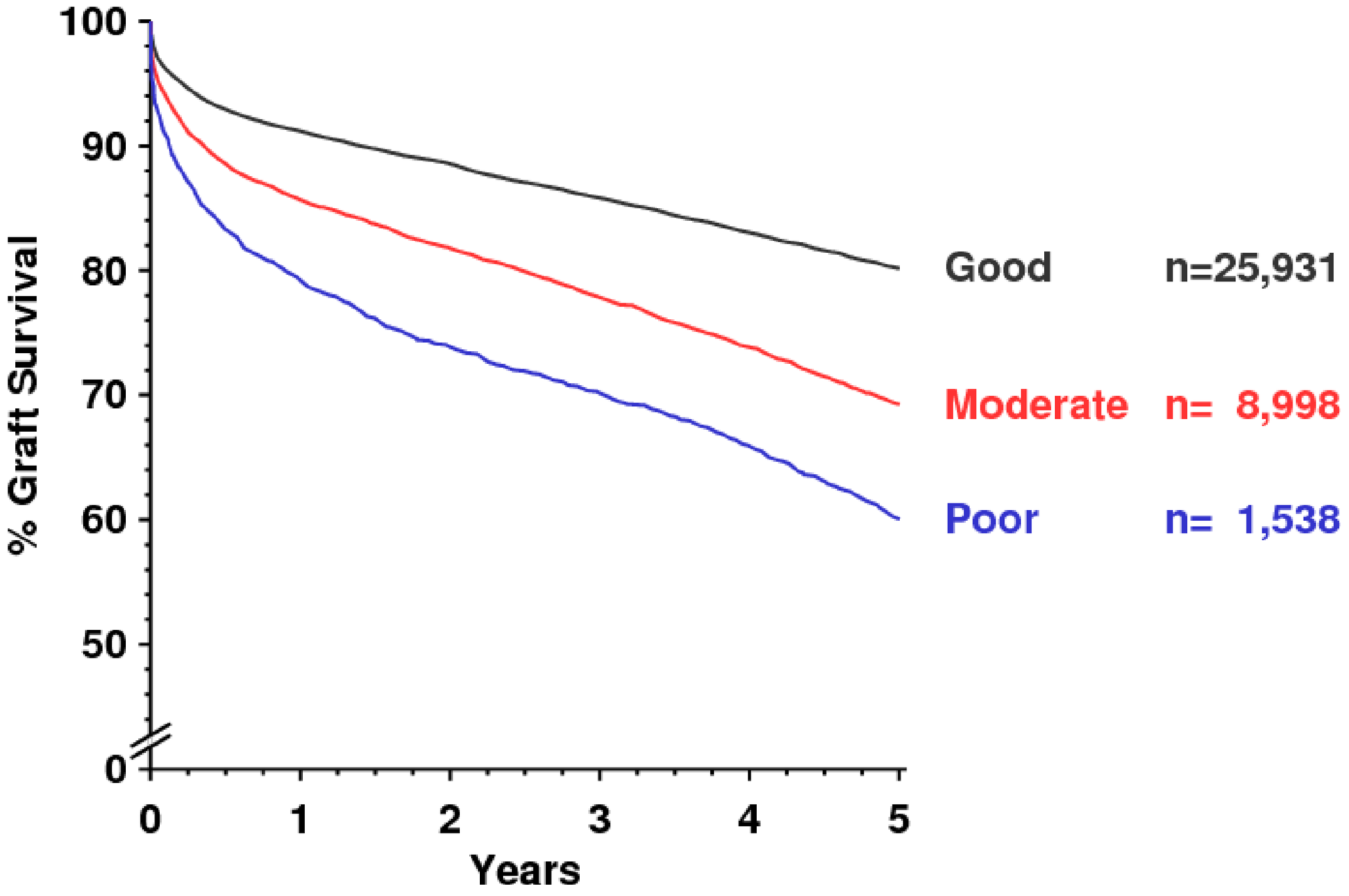
# HLA-A+B+DR Mismatches

## Deceased Donor, First Kidney Transplants 2000-2010



# Pretransplant Risk Assessment

## Deceased Donor, First Kidney Transplants 2000-2010



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 1, 2009 VOL. 360 NO. 1

# Machine Perfusion or Cold Storage in Deceased-Donor Kidney Transplantation

Cyril Moers, M.D., Jacqueline M. Smits, M.D., Ph.D., Mark-Hugo J. Maathuis, M.D., Ph.D., Jürgen Treckmann, M.D., Frank van Gelder, Bogdan P. Napieralski, Margitta van Kasterop-Kutz, Jaap J. Homan van der Heide, M.D., Ph.D., Jean-Paul Squifflet, M.D., Ph.D., Ernest van Heurn, M.D., Ph.D., Günter R. Kirste, M.D., Ph.D., Axel Rahmel, M.D., Ph.D., Henri G.D. Leuvenink, Ph.D., Andreas Paul, M.D., Ph.D., Jacques Pirenne, M.D., Ph.D., and Rutger J. Ploeg, M.D., Ph.D.*

# Machine Preservation Equipment

## LifePort® Kidney Transporter:

- Stand-alone machine
- Portable

DSO
DEUTSCHE STIFTUNG
ORGANTRANSPLANTATION

Received: 2 February 2018 | Revised: 13 May 2018 | Accepted: 29 May 2018

DOI: 10.1111/ajt.14963

MINIREVIEW

AJT

2018

# The future of marginal kidney repair in the context of normothermic machine perfusion

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[2]Department of Surgery, Yale School of Medicine, New Haven, CT

**Correspondence**
Jenna R. DiRito
Email: jrd57@cam.ac.uk

**Funding Information**
National Institute for Health Research Blood and Transplant Research Unit (NIHR BTRU) in Organ Donation and Transplantation at the University of Cambridge

Normothermic machine perfusion (NMP) is a technique that utilizes extracorporeal membrane oxygenation to recondition and repair kidneys at near body temperature prior to transplantation. The application of this new technology has been fueled by a significant increase in the use of the kidneys that were donated after cardiac death, which are more susceptible to ischemic injury. Preliminary results indicate that NMP itself may be able to repair marginal organs prior to transplantation. In addition, NMP serves as a platform for delivery of therapeutics. The isolated setting of NMP obviates problems of targeting a particular therapy to an intended organ and has the potential to reduce the harmful effects of systemic drug delivery. There are a number of emerging therapies that have shown promise in this platform. Nutrients, therapeutic gases, mesenchymal stromal cells, gene therapies, and nanoparticles, a newly explored modality, have been successfully delivered during NMP. These technologies may be effective at blocking multiple mechanisms of ischemia- reperfusion injury (IRI) and improving renal transplant outcomes. This review addresses the mecha-

# Game-changing kidney transplant technique developed in Toronto hospital

BY JESSICA BRUNO & AMANDA FERGUSON

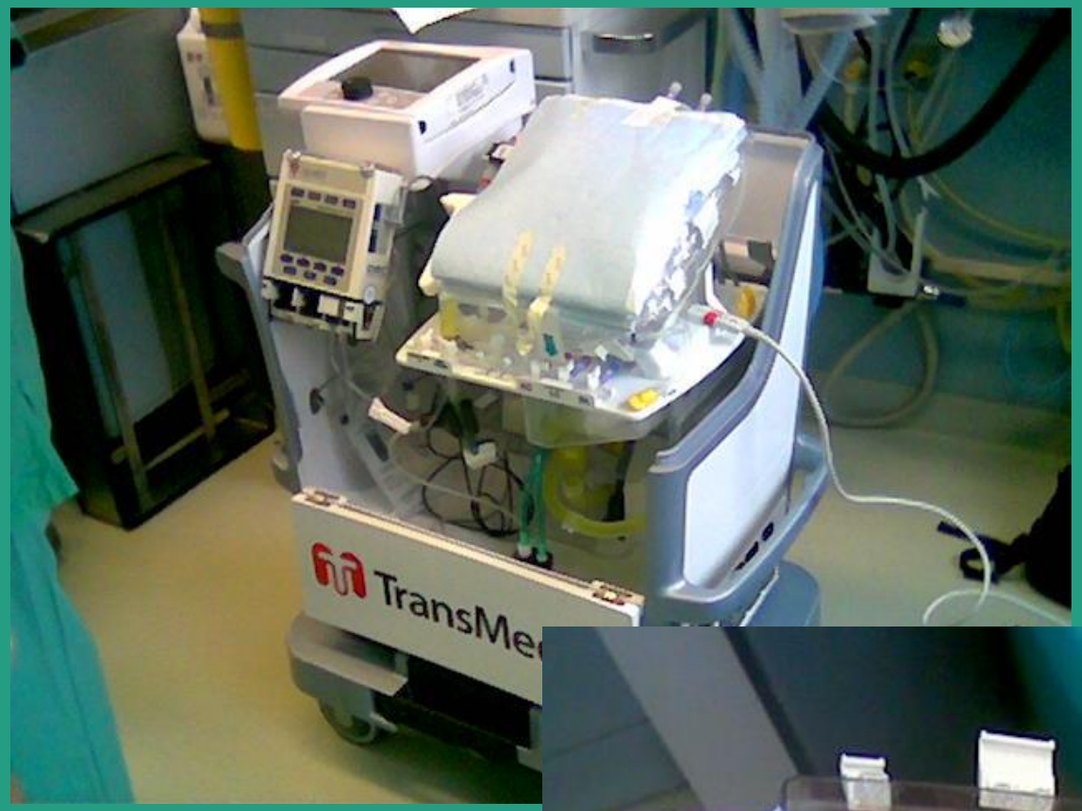
POSTED FEB 5, 2018 5:00 PM EST LAST UPDATED FEB 5, 2018 AT 7:05 PM EST

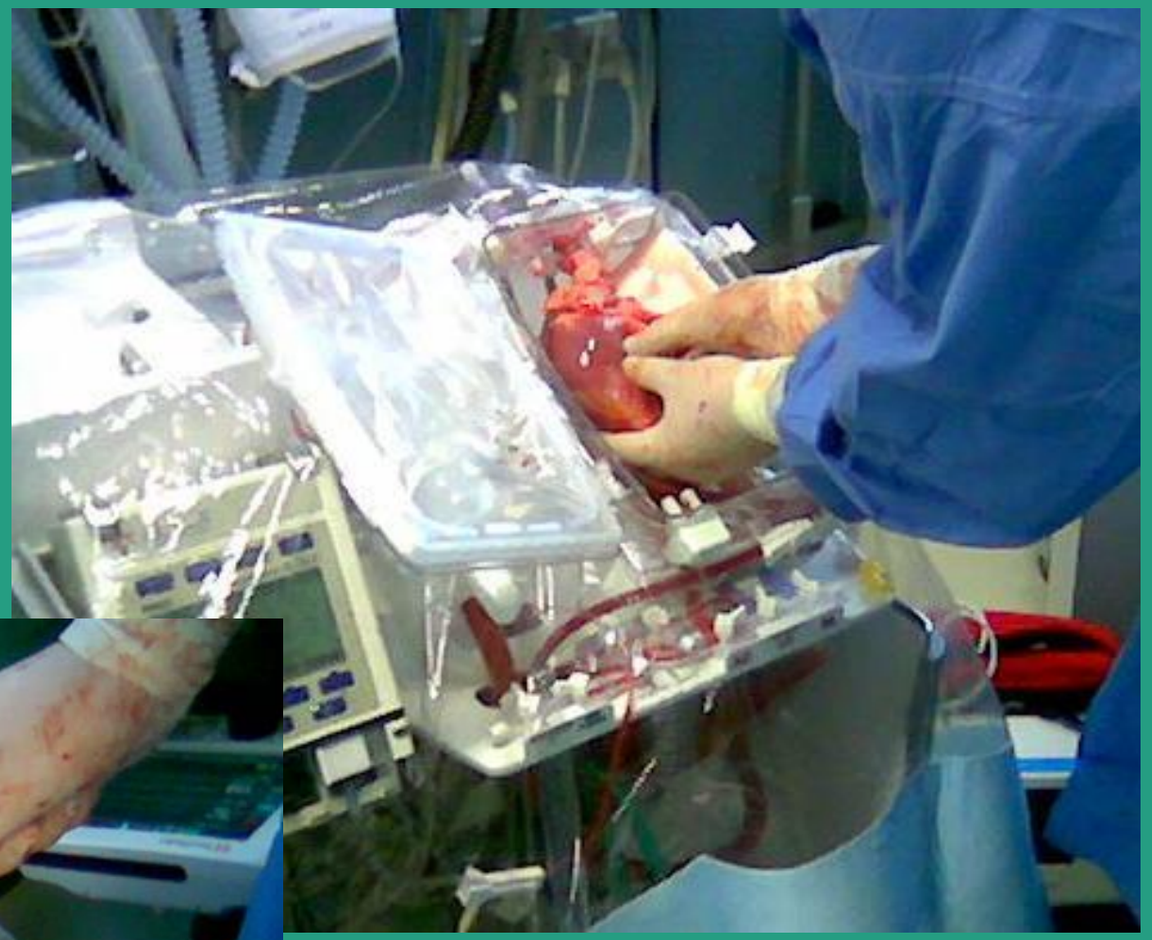
LIFE LOCAL

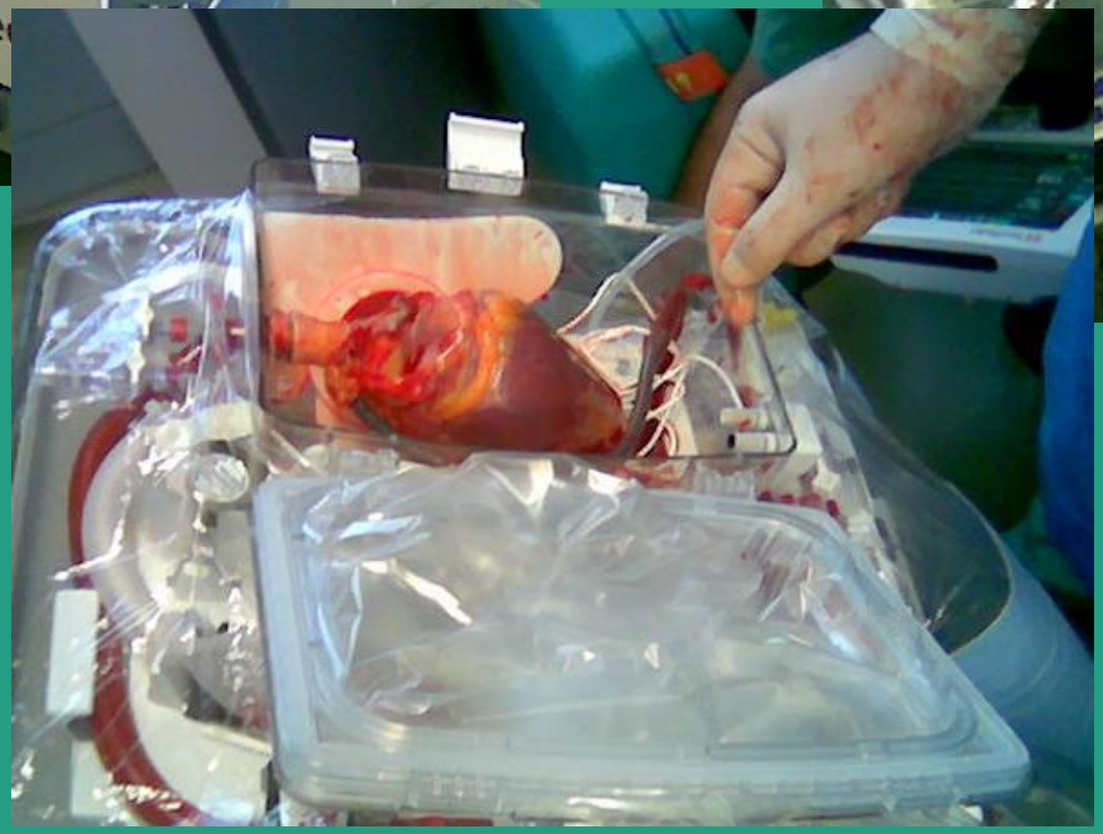

The procedure works by storing a kidney in a special “soup” of nutrients at body temperature, which helps restore the kidney before it is transplanted. Doctors can also monitor the organ prior to transplant.

2018

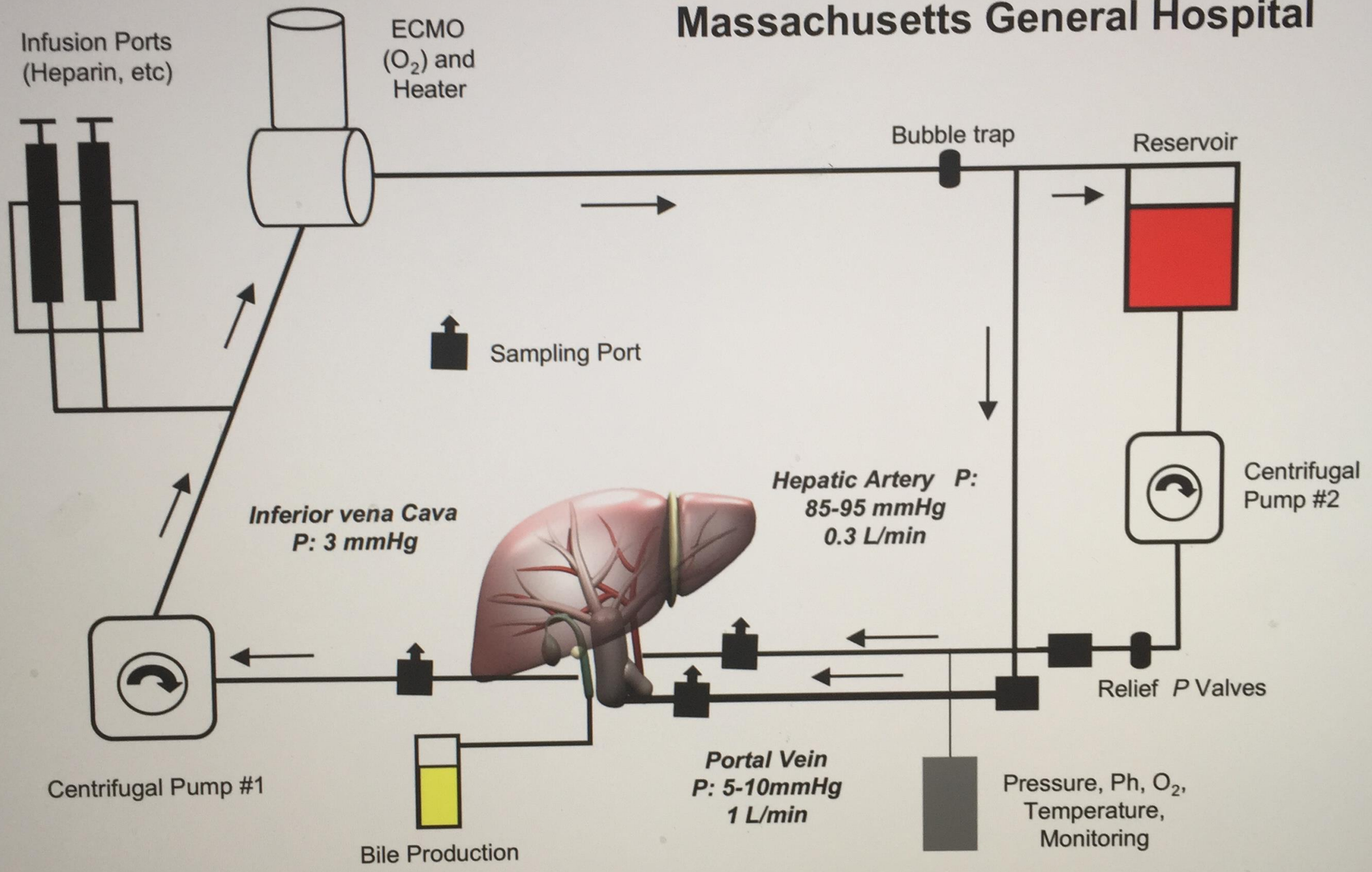
# Organkonservierung mit Pumpsystem



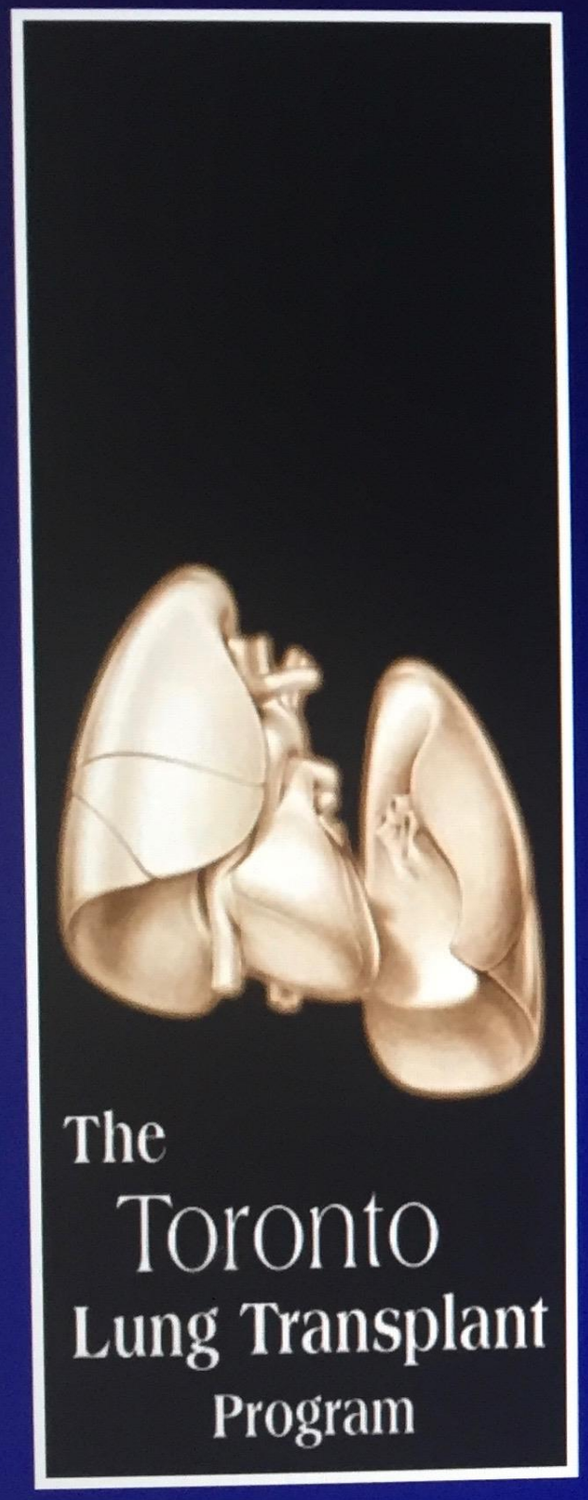


**Alejandro Soto-Gutierrez M.D. Ph.D.**
**Martin Hertl , M.D.**
**Center for Engineering in Medicine**
**Massachusetts General Hospital**




2018

# Ex vivo Repair of Donor Lungs for Transplantation

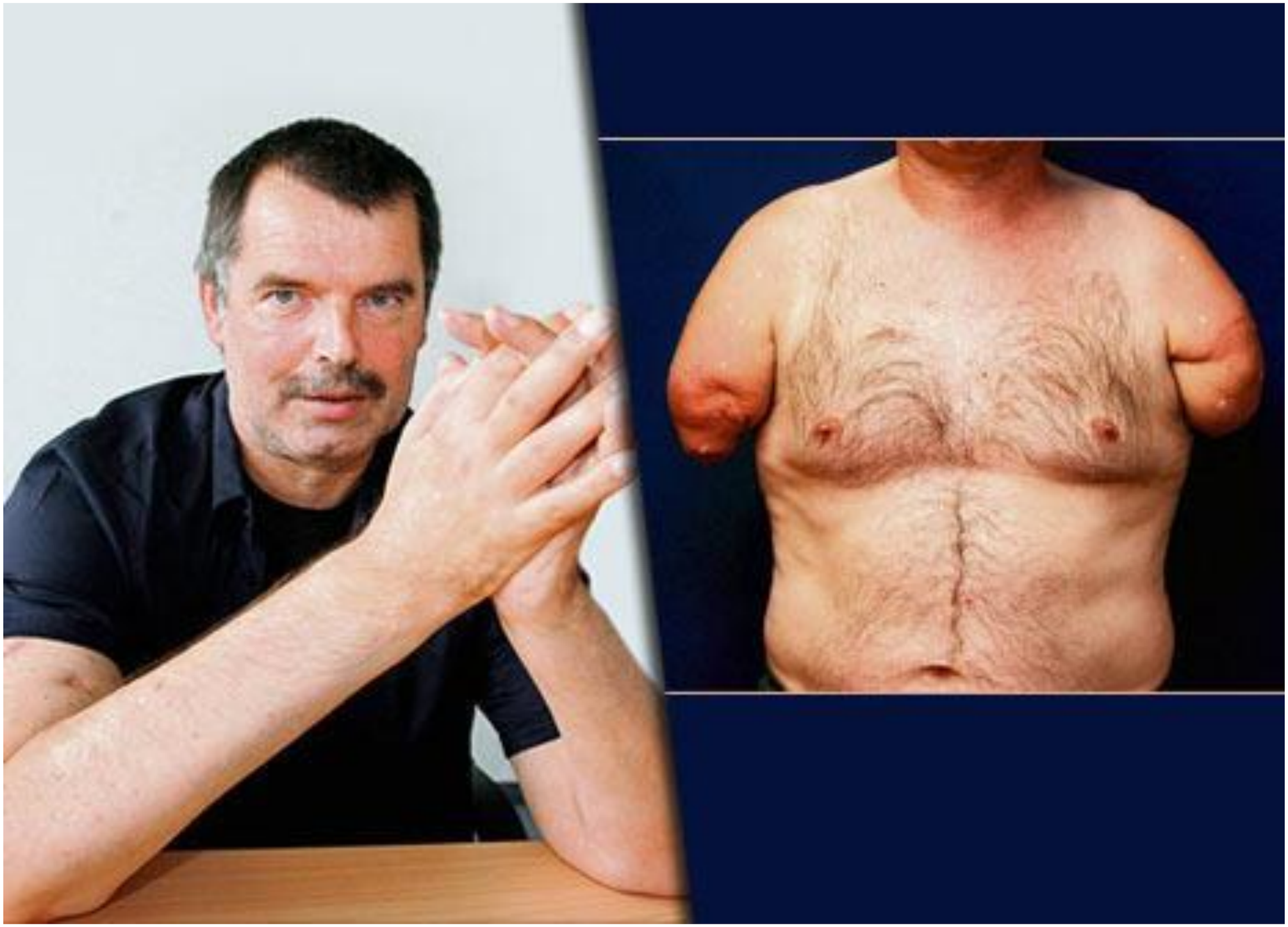


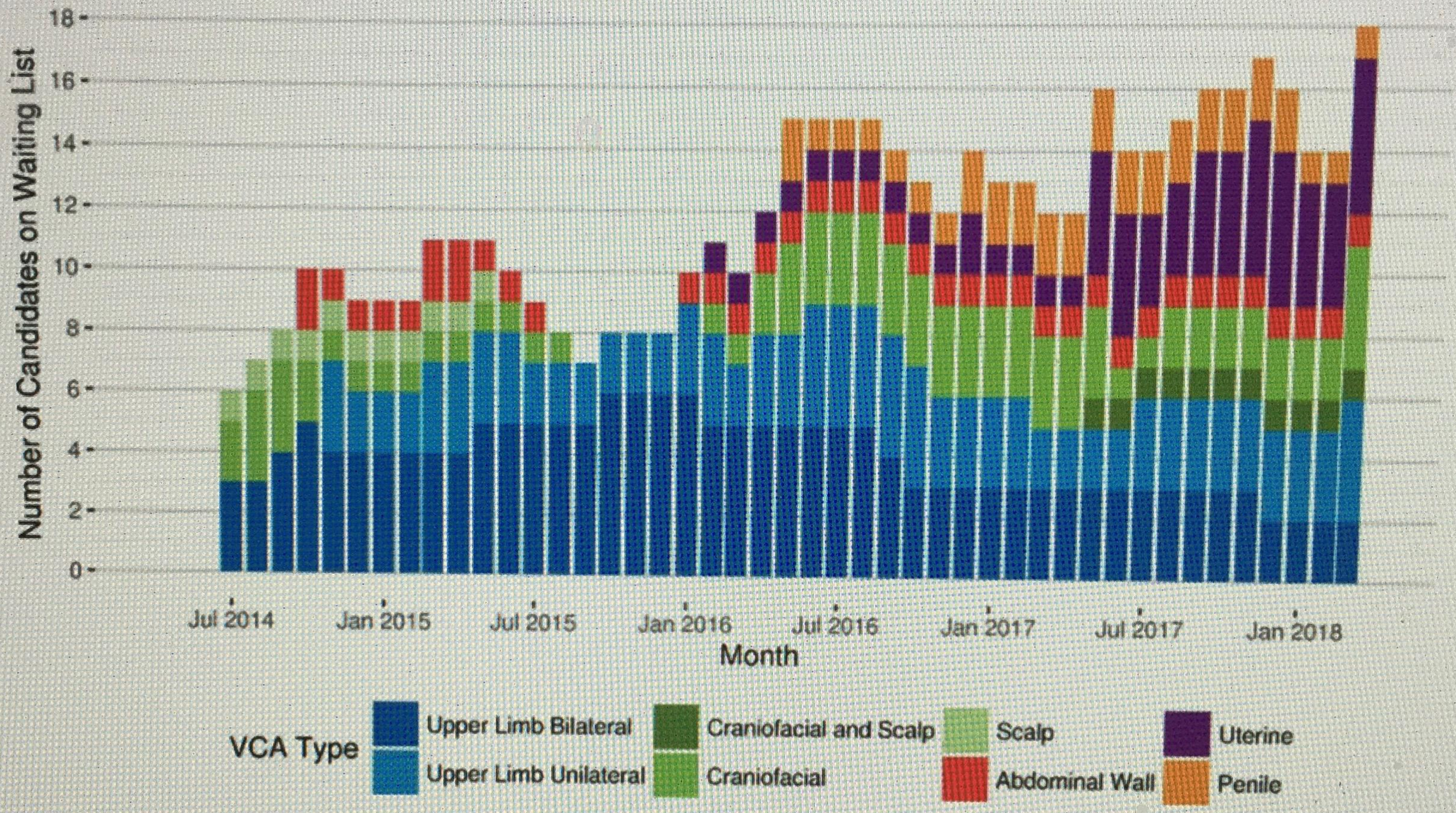

Shaf Keshavjee MD MSc FRCSC FACS

Director, Toronto Lung Transplant Program
Director, Latner Thoracic Research Laboratories
Professor and Chair, Division of Thoracic Surgery
Professor, Institute of Biomaterials and Biomedical Engineering
University of Toronto

# VCA vascular combined allografts

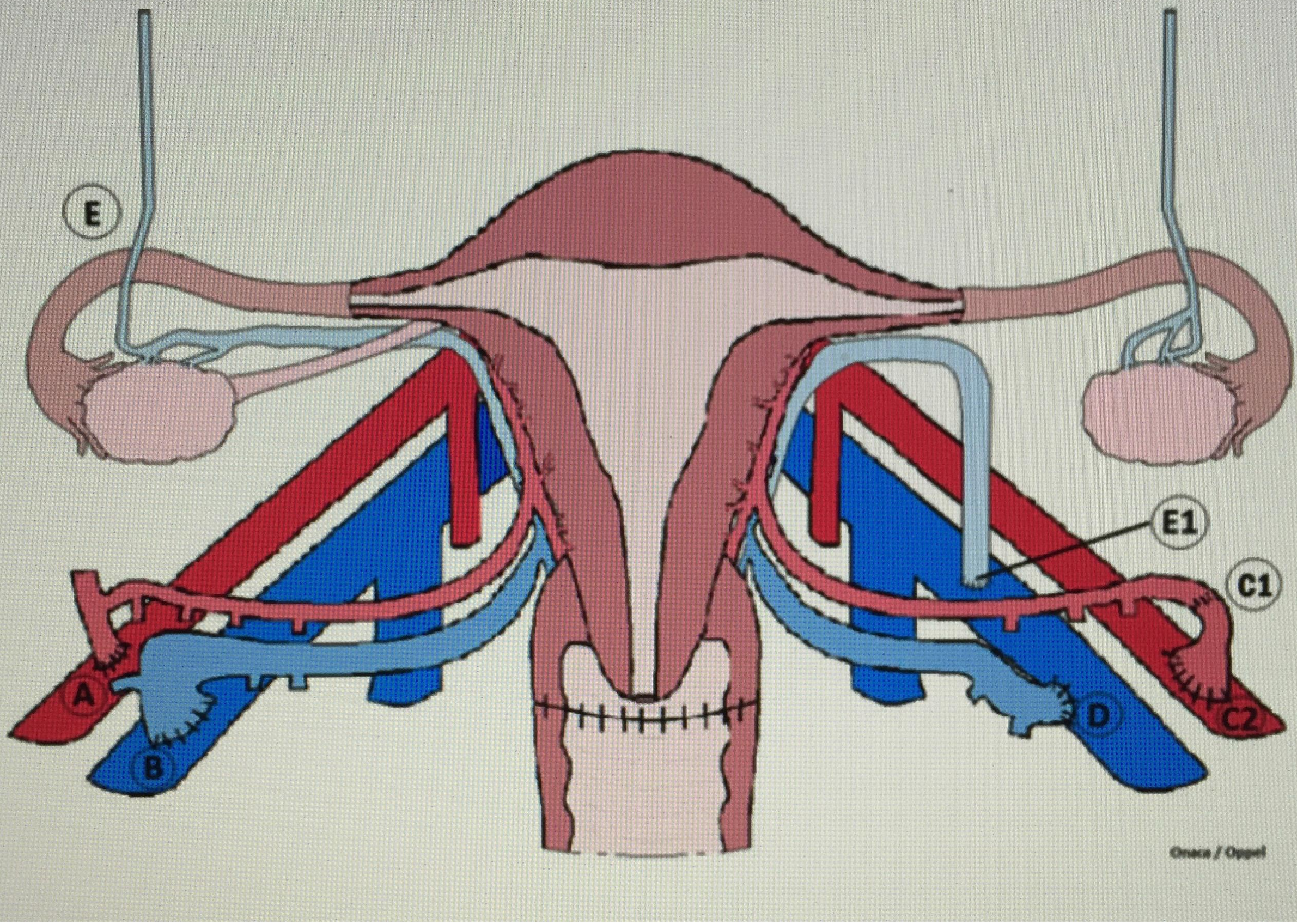
# Ethische & logistische Herausforderung






Data for July 2014 include candidates waiting at their transplant hospitals before July 3, 2014.

Candidates on the OPTN VCA waiting list by VCA type and Month July 3, 2014 to February 28, 2018.


E
E1
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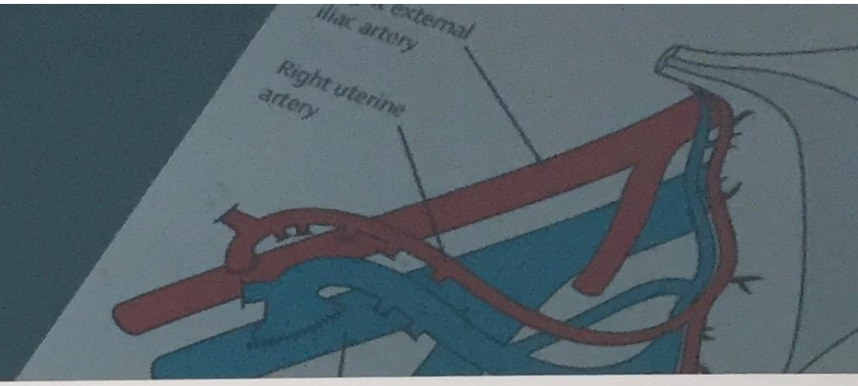
Prof Mats Brännström, MD • Liza Johannesson, MD • Hans Bokström, MD • Niclas Kvarnström, MD • Johan Mölne, MD • Pernilla Dahm-Kähler, MD • et al. Show all authors

Published: October 06, 2014 • DOI: https://doi.org/10.1016/S0140-6736(14)61728-1 • Check for updates






# Summary

2014

Background

Uterus transplantation is the first available treatment for absolute uterine infertility, which is caused by absence of the uterus or the presence of a non-functional uterus. Eleven human uterus transplantation attempts have been done worldwide but no livebirth has yet been reported.

Methods

In 2013, a 35-year-old woman with congenital absence of the uterus (Rokitansky syndrome) underwent transplantation of the uterus in Sahlgrenska University Hospital, Gothenburg, Sweden. The uterus was donated from a living, 61-year-old, two-parous woman. In-vitro fertilisation treatment of the recipient and her partner had been done before transplantation, from which 11 embryos were cryopreserved.

Findings

The recipient and the donor had essentially uneventful postoperative recoveries. The recipient's first menstruation occurred 43 days after transplantation and she continued to menstruate at regular intervals of between 26 and 36 days (median 32 days). 1 year after transplantation, the recipient underwent her first single embryo transfer, which resulted in pregnancy. She was then given triple immunosuppression (tacrolimus, azathioprine, and corticosteroids), which was continued throughout pregnancy. She had three episodes of mild rejection, one of which occurred during pregnancy. These episodes were all reversed by corticosteroid treatment. Fetal growth parameters and blood flows of the uterine arteries and umbilical cord were normal throughout pregnancy. The patient was admitted with pre-eclampsia at 31 full weeks and 5 days, and 16 h later a caesarean section was done because of abnormal cardiotocography. A male baby with a normal birthweight for gestational age (1775 g) and with APGAR scores 9, 9, 10 was born.

Interpretation

We describe the first livebirth after uterus transplantation. This report is a proof-of-concept for uterus transplantation as a treatment for uterine factor infertility. Furthermore, the results show the feasibility of live uterus donation, even from a postmenopausal donor.

American Journal of Transplantation 2017; 17: 2901–2910
Wiley Periodicals Inc.



doi: 10.111

2017

# Living Donor Uterus Transplantation: A Single Center's Observations and Lessons Learned From Early Setbacks to Technical Success

**G. Testa[1,*], E. C. Koon[2], L. Johannesson[1,3], G. J. McKenna[1], T. Anthony[1], G. B. Klintmalm[1], R. T. Gunby[4], A. M. Warren[5], J. M. Putman[4], G. dePrisco[6], J. M. Mitchell[7], K. Wallis[1] and M. Olausson[8]**

*[1]Annette C. and Harold C. Simmons Transplant Institute, Baylor University Medical Center, Dallas, TX*
*[2]Obstetrics and Gynecology/Gynecologic Oncology, Baylor University Medical Center, Dallas, TX*
*[3]Obstetrics and Gynecology, Sahlgrenska University Hospital, Gothenburg, Sweden*

**estimated blood loss; HIV, human immunod virus; HPV, human papillomavirus; ICU, i care unit; IRB, institutional review board; M netic resonance; MRI, magnetic resonance MRKH, Mayer–Rokitansky–Küster–Hauser sy OPU, ovum pick-up; Pap, Papanikolaou; PGS plantation genetic screening; POD, posto day; SVD, spontaneous vaginal delivery; UTI tract infection; WIT, warm ischemia time**

**Received 12 January 2017, revised 04 April 2 accepted for publication 13 April 2017**

# Technische Herausforderungen

Original Clinical Science—Liver

# One Hundred Fifteen Cases of Pure Laparoscopic Living Donor Right Hepatectomy at a Single Center

Kwang-Woong Lee, PhD, MD,[1] Suk Kyun Hong, MD,[1] Kyung-Suk Suh, PhD, MD,[1] Hyo-Sin Kim, MD,[2] Sung-Woo Ahn, MD,[3] Kyung Chul Yoon, MD,[1] Jeong-Moo Lee, MD,[1] Jae-Hyung Cho, MD,[1] Hyeyoung Kim, MD,[4] and Nam-Joon Yi, PhD, MD[1]

2018

**Background.** The pure laparoscopic approach to donor hepatectomy is being taken more often. However, few centers perform pure laparoscopic donor right hepatectomy (PLDRH) because it requires a high level of surgical skill. Studies reporting initial outcomes of PLDRH may prompt further implementation of the technique and help reduce initial learning curves at other transplant centers. This study reports performance of PLDRH at a single center with extensive experience of adult living donor liver transplantation. **Methods.** Data from 115 donors (and recipients) who underwent PLDRH between November 2015 and June 2017 were analyzed retrospectively. Subgroup analysis was performed to compare outcomes between the initial (November 2015 to October 2016) and more recent (November 2016 to June 2017) periods. **Results.** During the initial period, 3 (2.6%) donors experienced complications greater than grade III on the Clavien-Dindo scale. By contrast, no donors developed complications during the recent period. The operative time (293.6 minutes vs 344.4 minutes; $P < 0.001$) and hospital stay (7.3 days vs 8.3 days; $P = 0.002$) were significantly shorter during the more recent period. Also, Δhemoglobin (Hb)%, calculated as ΔHb% = [(preoperative Hb – postoperative Hb)/preoperative Hb] × 100 (14.9% vs 17.5%; $P = 0.042$), and Δaspartate aminotransferase (AST)%, calculated as ΔAST % = [(peak AST – preoperative AST)/preoperative AST] × 100 (1048.9% vs 1316.6%; $P = 0.009$), were significantly lower during the recent period. **Conclusions.** Pure laparoscopic donor right hepatectomy is both feasible and safe when performed at a center experienced in adult living donor liver transplantation. Performance of about 60 PLDRHs over 1 year is sufficient to standardize the procedure.

(*Transplantation* 2018;102: 1878–1884)

American Journal of Transplantation

AST | AMERICAN SOCIETY OF TRANSPLANTATION

ASTS

ORIGINAL ARTICLE | Full Access

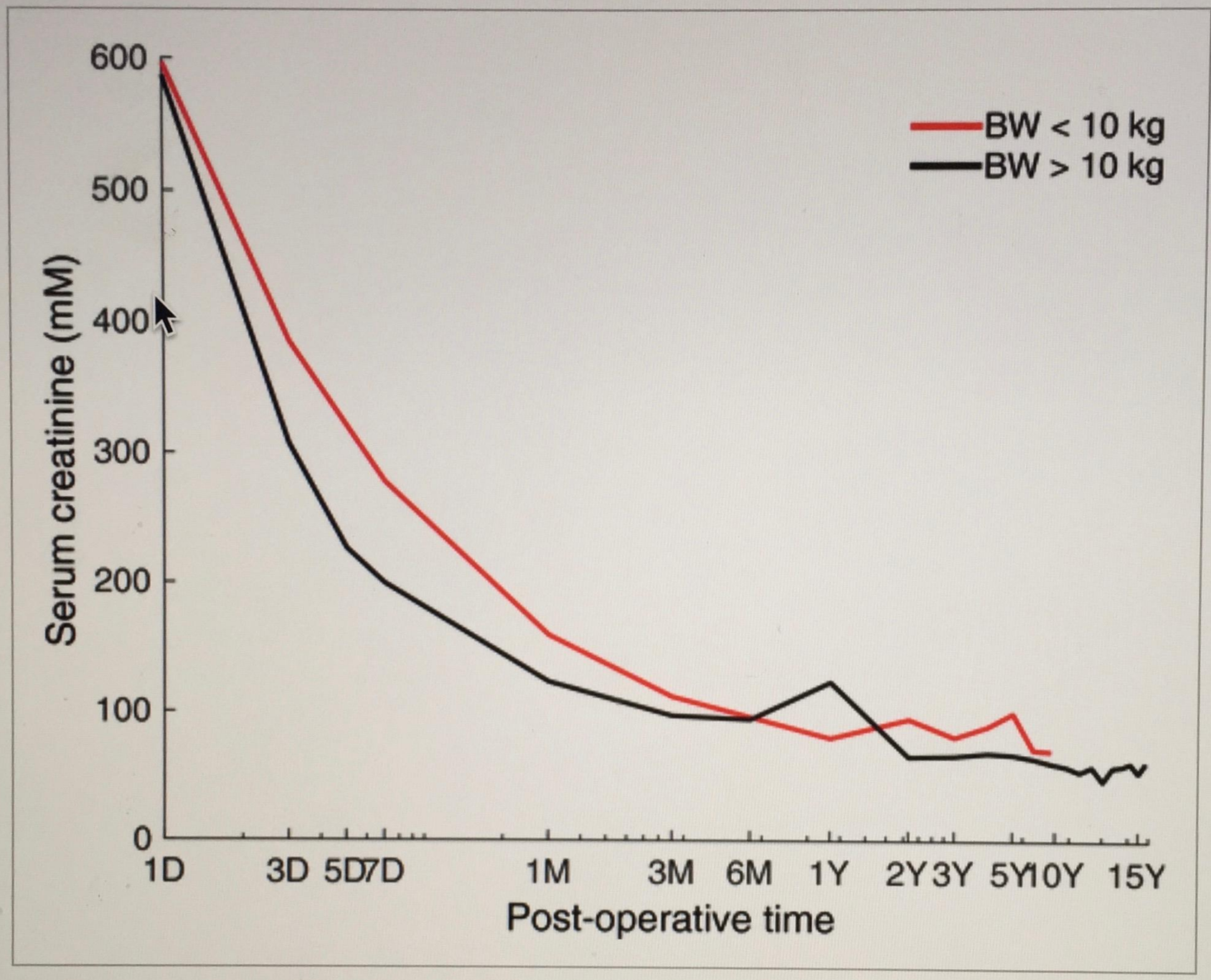
# Renal transplant from infant and neonatal donors is a feasib option for the treatment of end-stage renal disease but is associated with increased early graft loss

Imeshi Wijetunga, Clare Ecuyer, Sonsoles Martinez-Lopez, Muhammad Jameel, Richard J. Baker, Matthew Welberry Smith, Chirag Patel, Michael Weston, Niaz Ahmad ✉

First published: 07 July 2018 | https://doi.org/10.1111/ajt.15006

Part of this study was presented as oral presentations at the British Transplant Society (BTS) Meet Glasgow, 24-26 February 2016, Transplantation Society (TTS) Congress, Hong Kong, 18-22 August 2 and BTS Meeting, Brighton, 14-16 March 2018.

2018

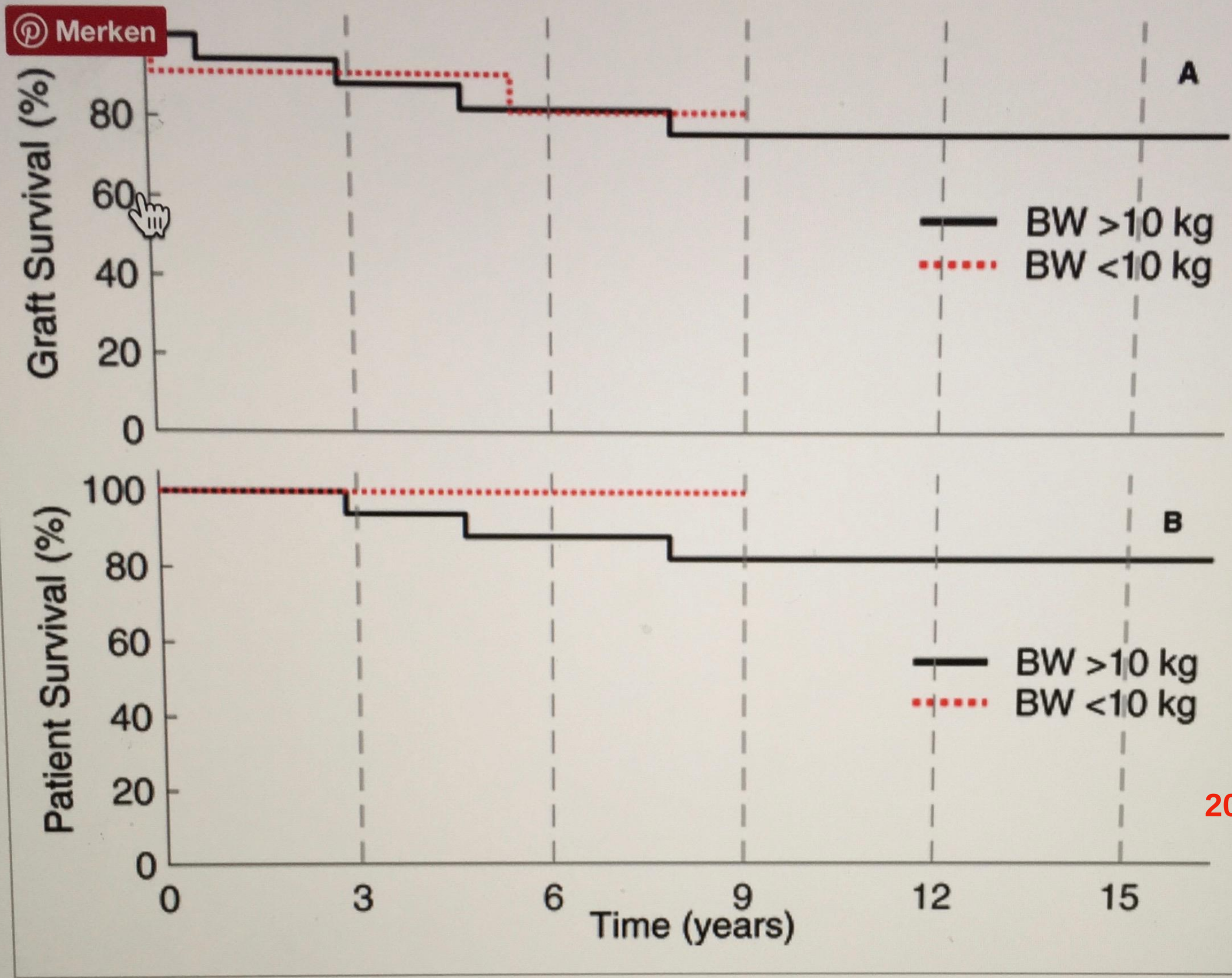



2018

**Figure 1**

Open in figure viewer | PowerPoint

Serum creatinine in recipients of transplants from donors in the large (black) and small (red) groups. Serum creatinine declined rapidly in both groups during the first year posttransplant, and there were no significant differences between the groups. Note that the *x*-axis is logarithmic [Color figure can be viewed at wileyonlinelibrary.com]


Graft Survival (%)
80
60
40
20
0
A
BW >10 kg
BW <10 kg
Patient Survival (%)
100
80
60
40
20
0
B
BW >10 kg
BW <10 kg
0
3
6
9
12
15
Time (years)

2018

| ation of en bloc kidneys without transposition of IVC and AA conduits | **B** Implantation of en bloc kidneys with transposition (switch) of AA & IVC conduits |
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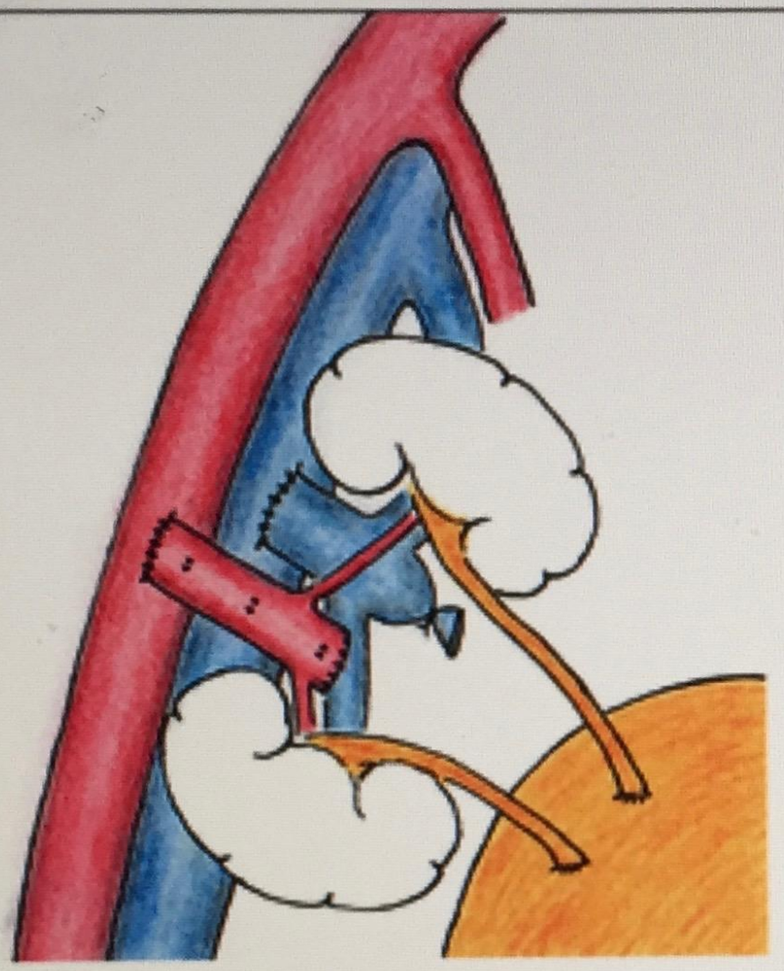
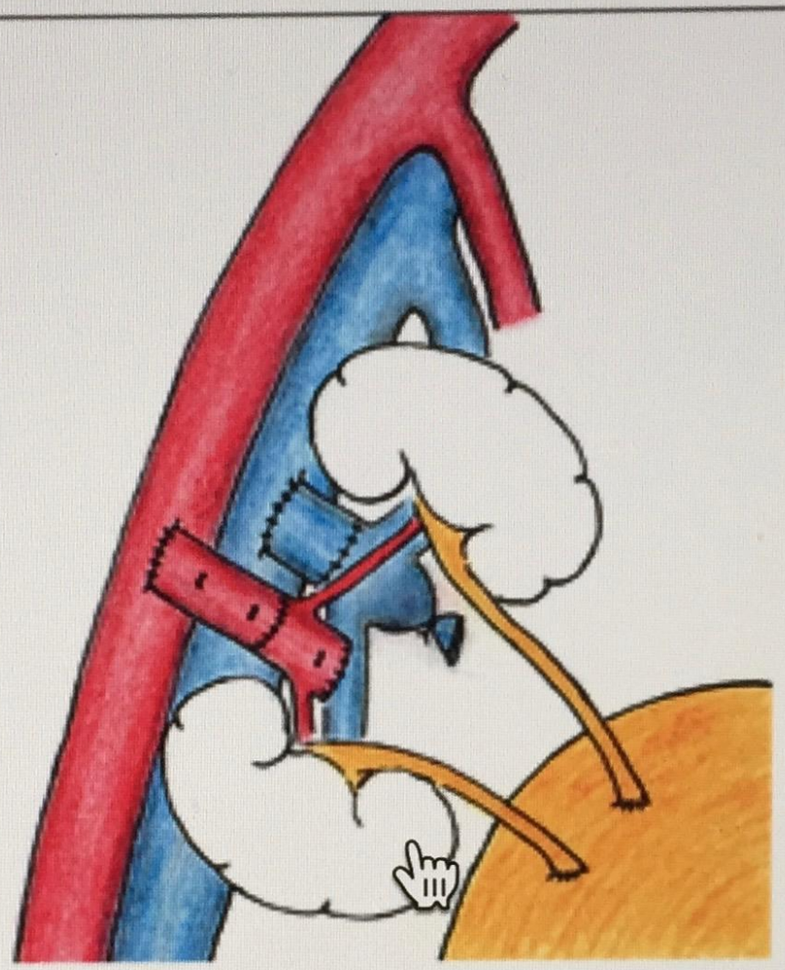
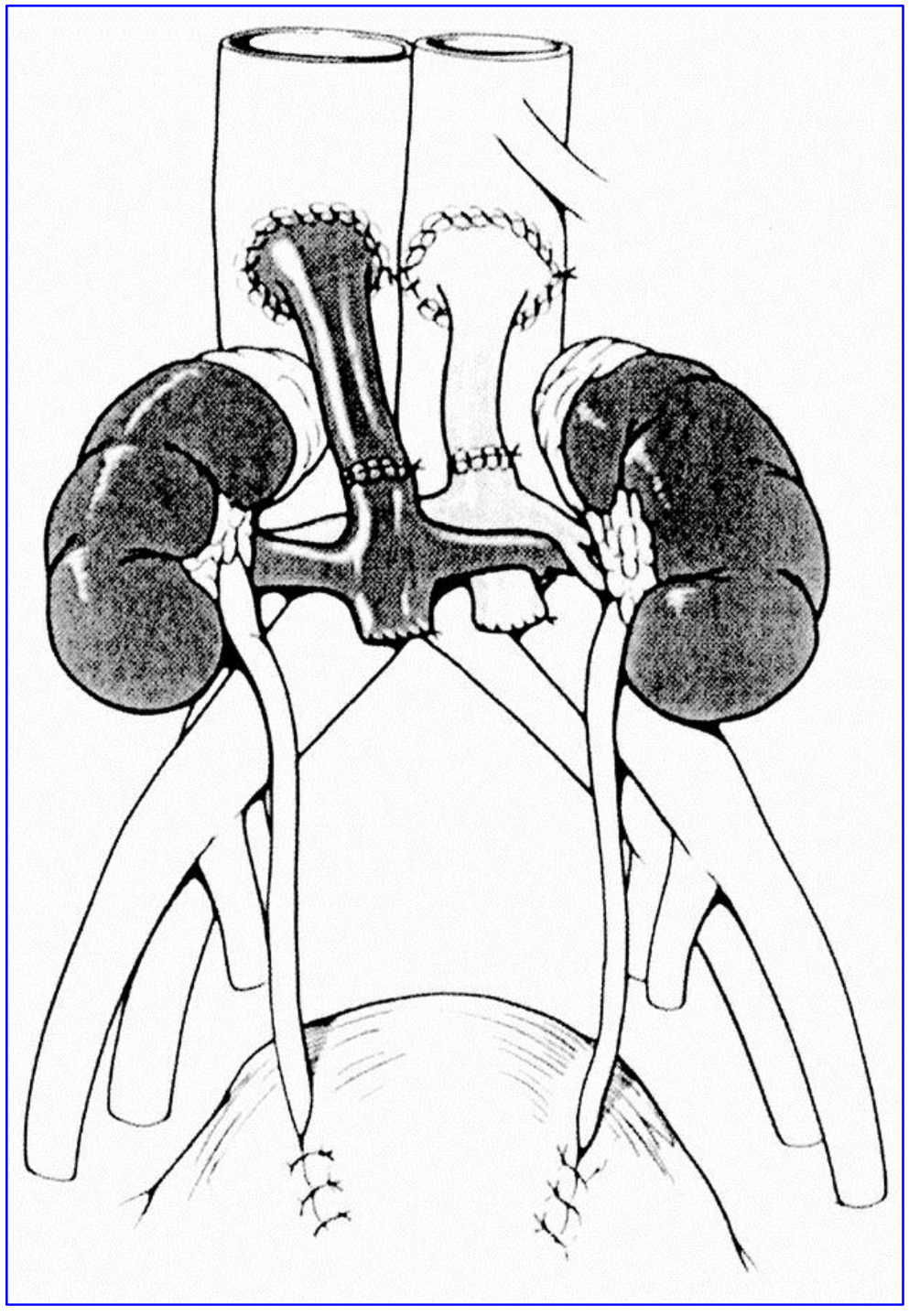
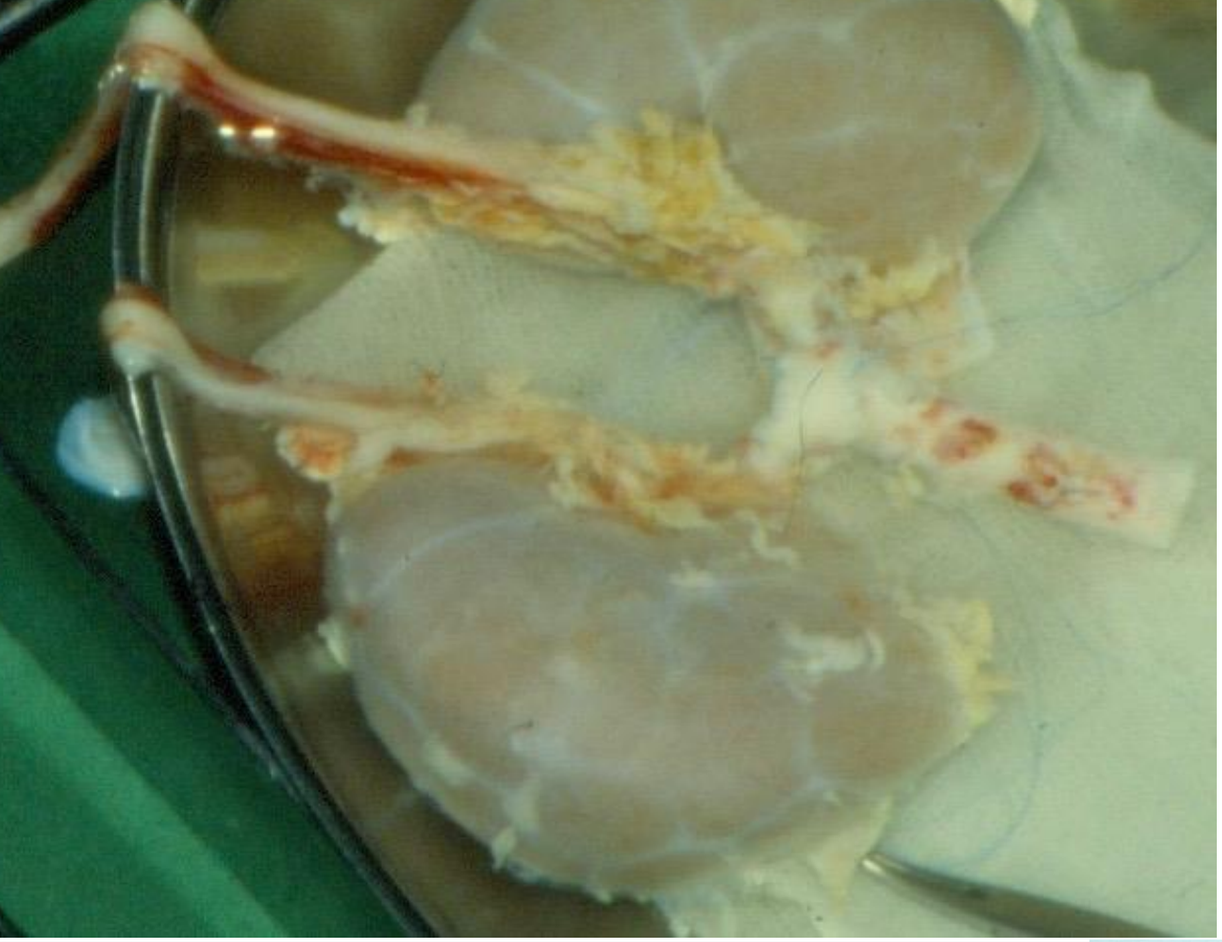
|  |  |

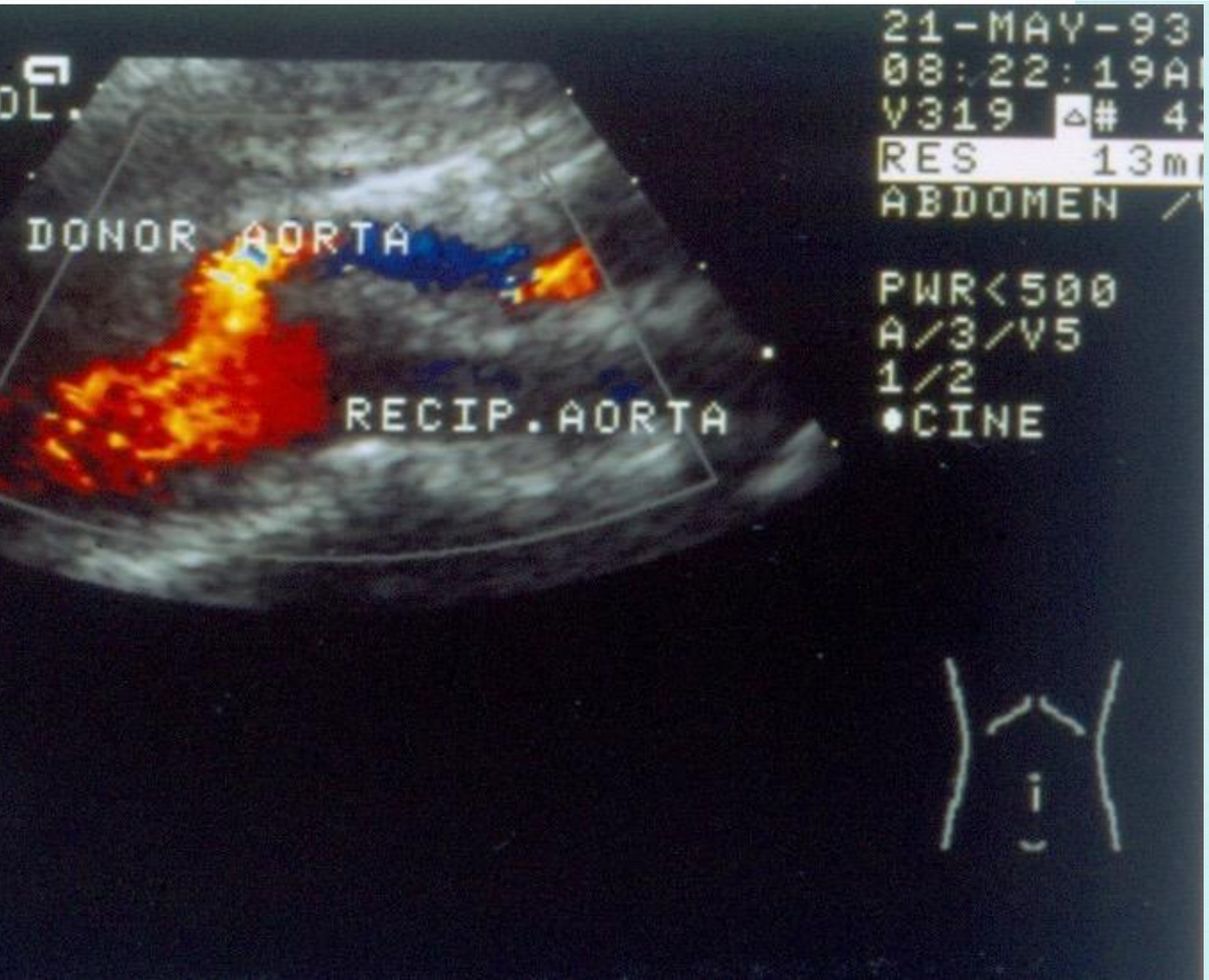
# surgical Technique en-bloc KidneyTx



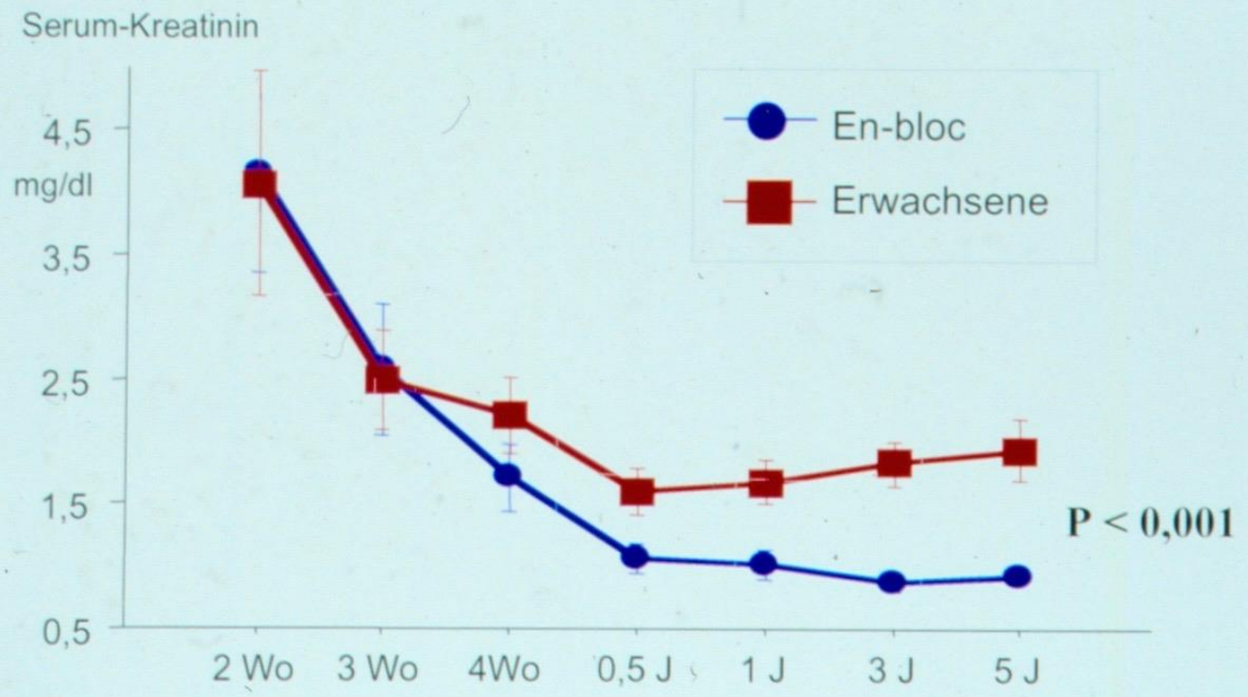
1993



**1993**




# Serum-Kreatinin im Verlauf



# Twenty-Year Graft Survival and Graft Function Analysis by a Matched Pair Study Between Pediatric En Bloc Kidney and Deceased Adult Donors Grafts

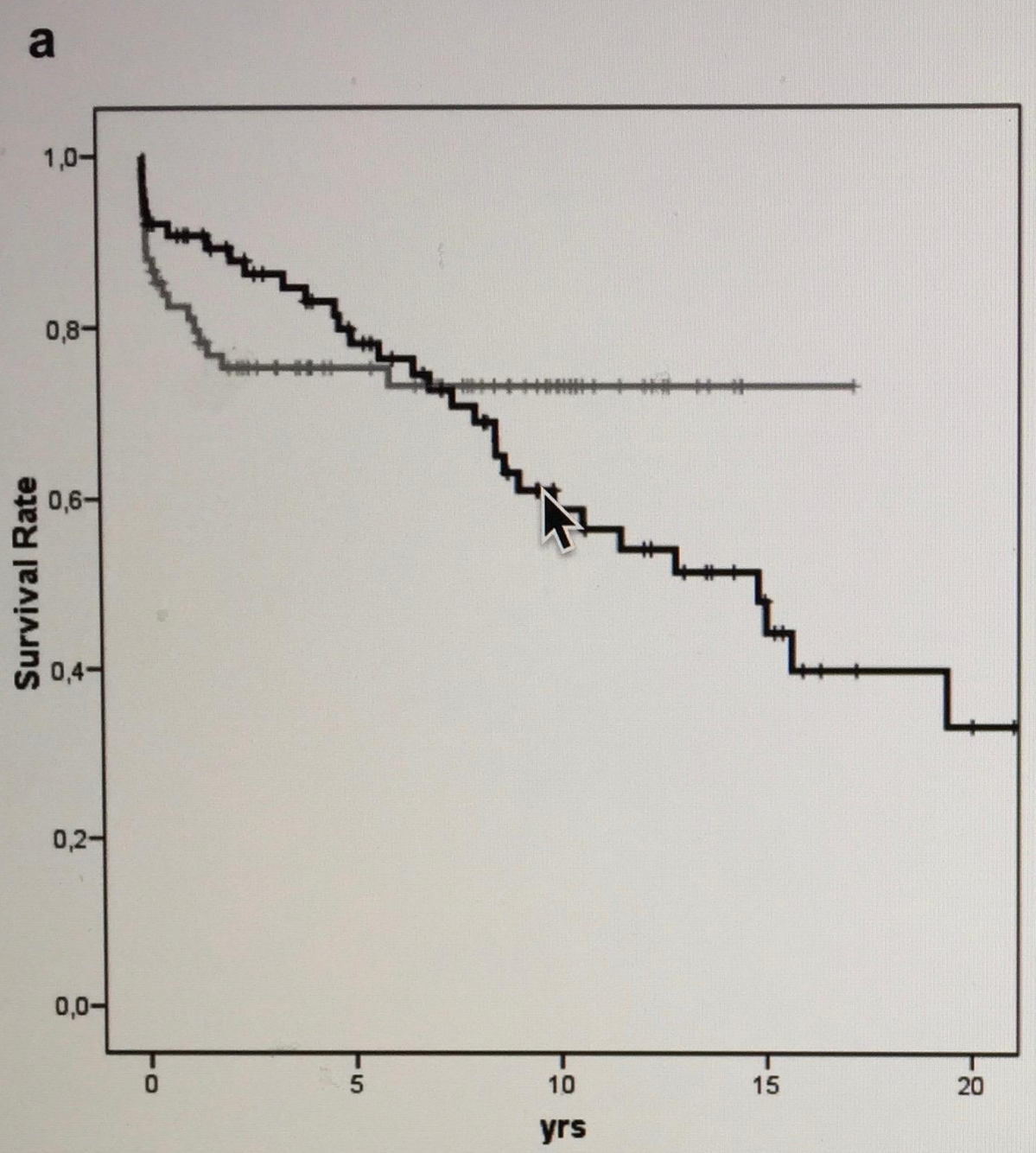
*Oliver Thomusch, Dietlind Tittelbach-Helmrich, Sebastian Meyer, Oliver Drognitz, and Przemyslaw Pisarski*

**Background.** Pediatric en bloc kidney grafts, especially those from donors aged younger than 12 months, are still regarded controversially with respect to long-term graft survival and function as well as the postoperative development of serious hypertension and proteinuria.

**Patients and Methods.** This retrospective single-center study analyzed 78 pediatric en bloc kidney grafts transplanted between October 1989 and December 2008. Mean donor age was 15 months in the pediatric en bloc kidney donor group and 37.8 years in the matched pair group. The mean follow-up period was 9.3 years (range, 1–19 years). Statistical analysis was performed using the Kaplan-Meier test for patient and graft survival. Continuous variables were compared using independent sample *t* test.

**Results.** Graft survival for the pediatric donors after 1, 5, and 10 years were 83.1%, 76.0%, 73.9% and for the matched pair control group 89.6%, 78.7%, and 57.8%, respectively. Serum creatinine levels after 1, 5, and 10 years were 1.0, 0.8, 1.1 mg/dL and for the matched pair control group 1.5, 1.7, and 1.6 mg/dL, respectively. No significant long-term differences were detected between the study cohort groups with respect to the postoperative development of hypertension and proteinuria.

**Conclusion.** Overall, pediatric en bloc kidney grafts are well suited to



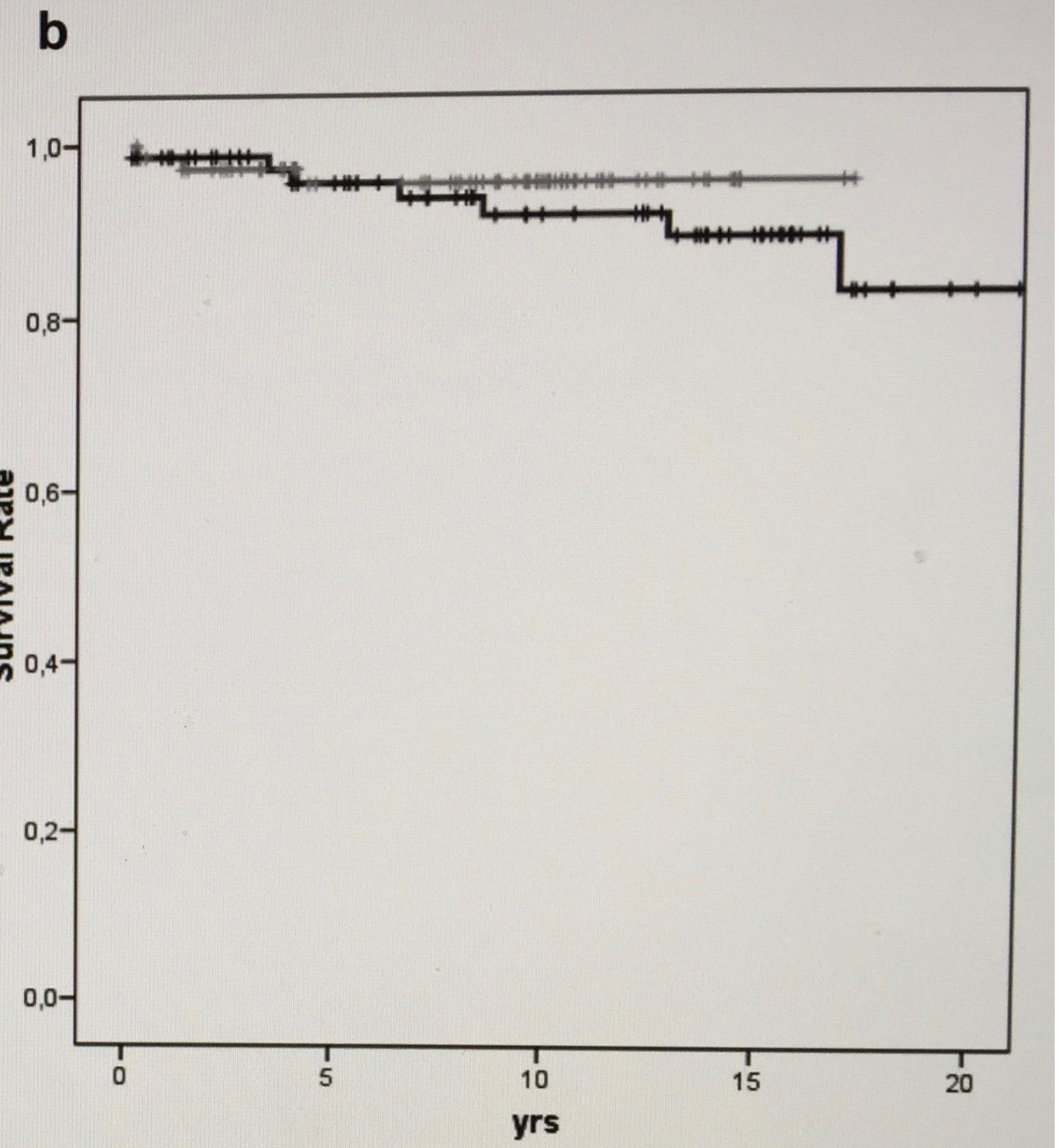




**FIGURE 1.** (a and b) Long-term graft survival patient survival of pediatric en bloc kidney grafts compared with a matched pair control group of adult deceased donors. Black curves: matched pair, gray curves: pediatric en bloc.

2014

# Neue Therapien

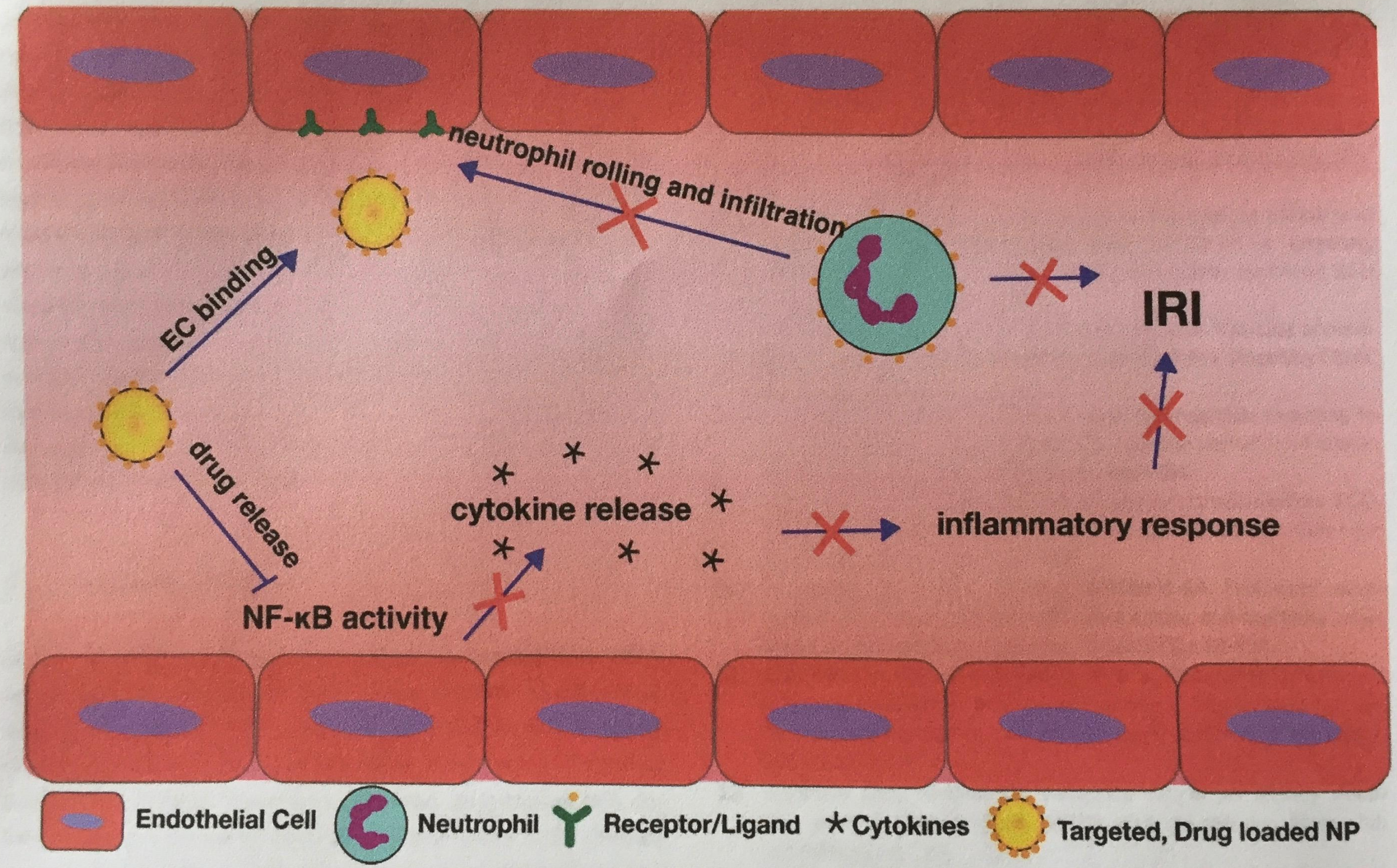



**FIGURE 2** Using NPs as a therapeutic agent in IRI. The use of targeted, drug-loaded NPs can serve as a therapy that blocks more than one mechanism of IRI (eg, neutrophil binding to endothelial cells and NF-κB activity)

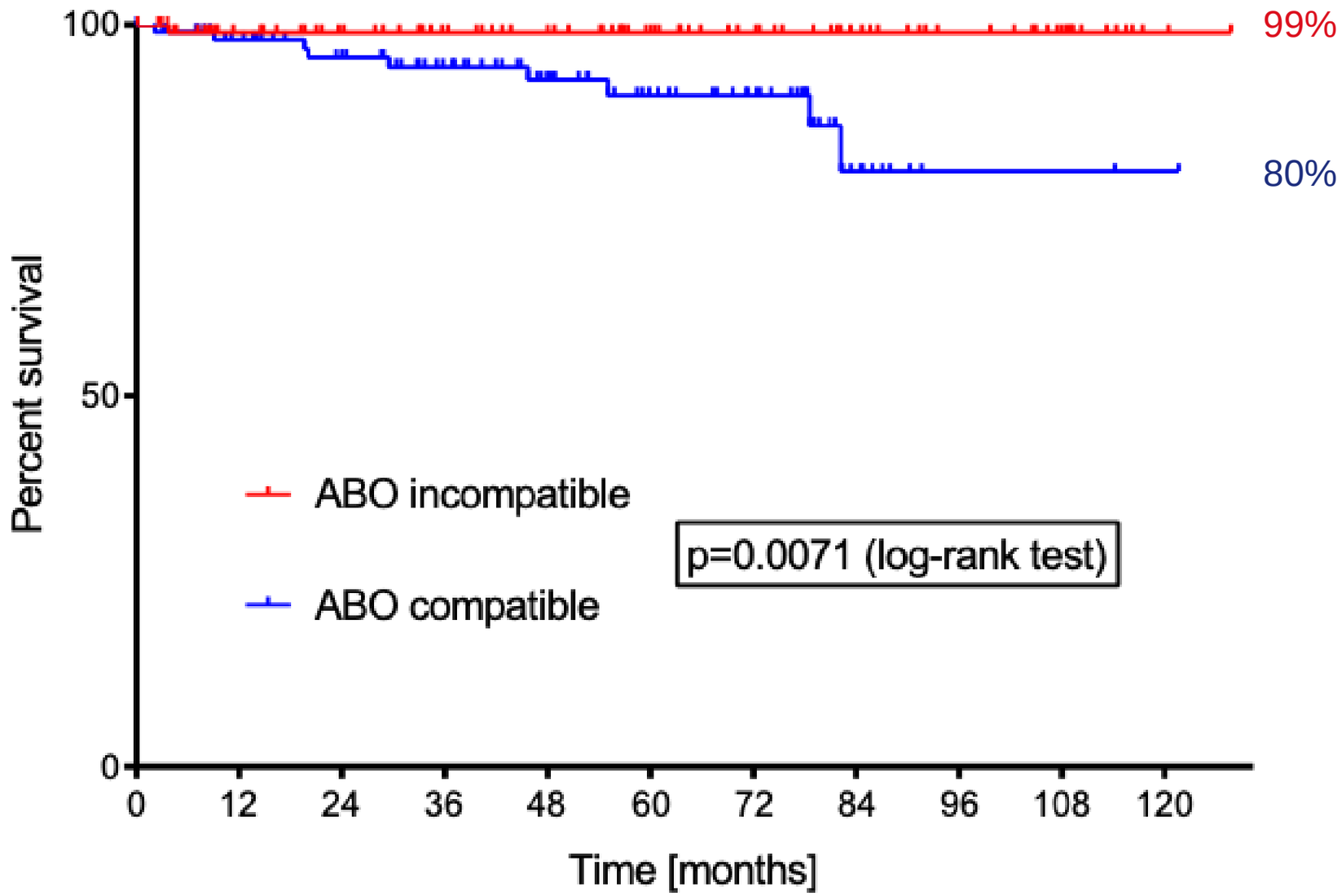
# Immunologische Veränderungen

# Transplantationszentrum Freiburg

1968 - 2018

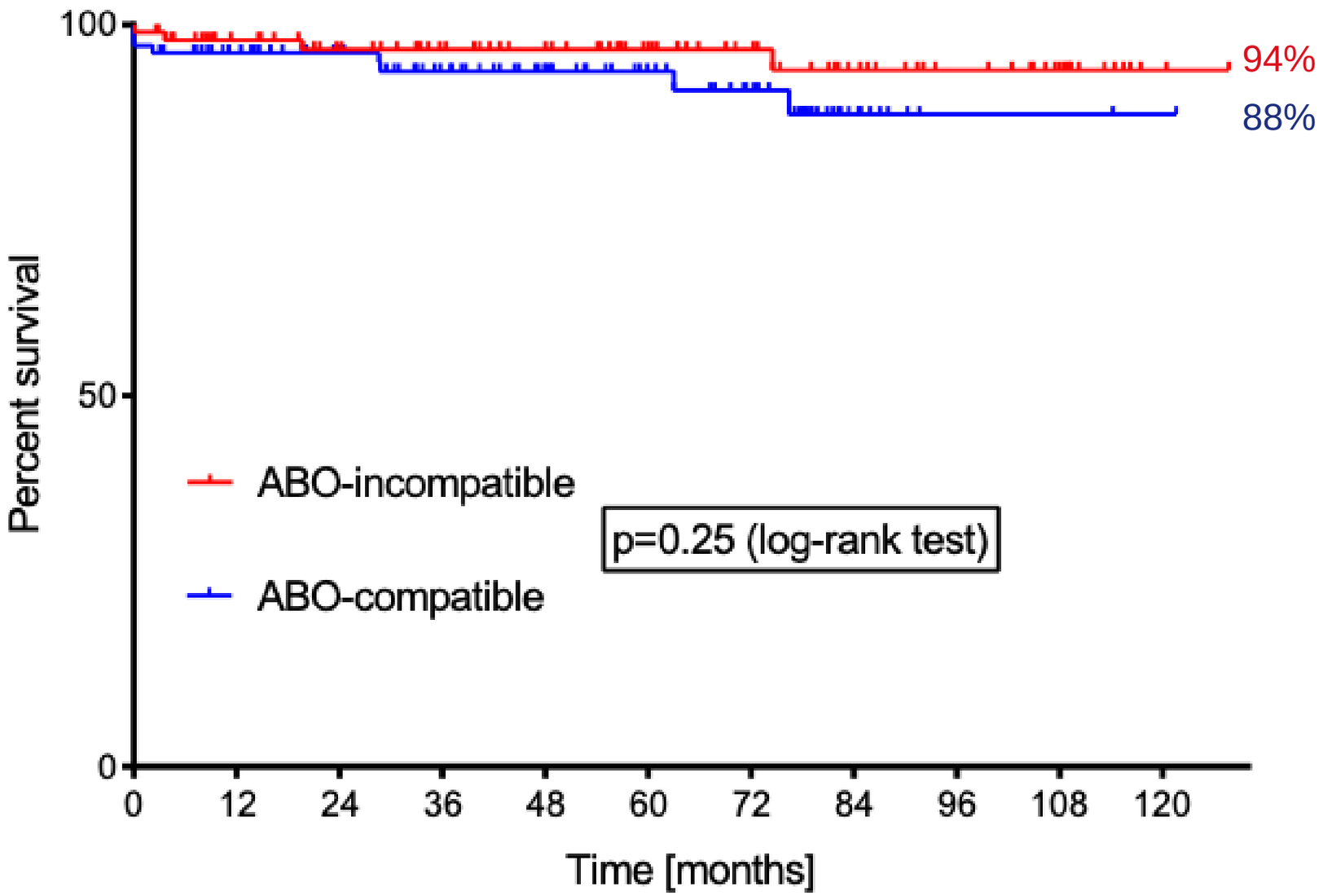
| | |
|---|---|
| . Nierentransplantationen | 3830 |
| . Nierenlebendspenden | 471 |
| . Nierentransplantationen bei Kindern | 173 |
| . Nierenlebendspenden ABO i | 133 |
| . Lebertransplantationen | 131 |
| . Pankreas- / Nierentransplantationen | 141 |
| . Herztransplantationen | 348 |
| . Lungentransplantationen | 180 |

# Patientenüberleben ABO*i* vs ABOc



# Transplantatüberleben ABO*i* vs ABOc

Todesfall-bereinigt



# Outcomes of Pediatric ABO-incompatible Living Kidney Transplantations From 2002 to 2015: An Analysis of the Japanese Kidney Transplant Registry

Motoshi Hattori, MD, PhD,[1] Makiko Mieno, PhD,[2] Seiichiro Shishido, MD, PhD,[3,4] Atsushi Aikawa, MD, PhD,[3] Hidetaka Ushigome, MD, PhD,[5] Shinichi Ohshima, MD, PhD,[6] Kota Takahashi, MD, PhD,[7] Akira Hasegawa, MD, PhD,[8] and on behalf of the Japan Society for Transplantation and Japanese Society for Clinical Renal Transplantation

2018

**Background.** Extensive data have been accumulated for adults who have undergone ABO-incompatible (ABOi)-living kidney transplantation (LKT). In contrast, available published data on pediatric recipients who underwent ABOi-LKT from the early to middle 2000s is very limited. Thus, pediatric ABOi-LKT has remained relatively rare, and there is a lack of large, multicenter data. **Methods.** We analyzed data from the Japanese Kidney Transplant Registry to clarify the patient and graft outcomes of pediatric recipients who underwent ABOi-LKT from 2002 to 2015. A total of 102 ABOi and 788 ABO-compatible (ABOc) recipients were identified in this study. All recipients had received basiliximab and a triple immunosuppressive protocol comprising calcineurin inhibitors, mycophenolate mofetil, and steroids. The ABOi recipients also received preconditioning therapies including B-cell depletion by a splenectomy or rituximab treatment and therapeutic apheresis. **Results.** Death rates for ABOi and ABOc recipients were 0.17 versus 0.17 deaths per 100 patient-years. Graft loss rates for ABOi and ABOc recipients were 1.58 versus 1.45 events per 100 patient-years. No particular causes of death or graft loss predominantly affected ABOi or ABOc recipients. **Conclusions.** The results of this registry analysis suggest that pediatric ABOi-LKT can be performed efficiently. Although further studies are clearly required to perform pediatric ABOi-LKT more safely and less invasively, ABOi-LKT is now an acceptable treatment for pediatric patients with end-stage renal disease.

(*Transplantation* 2018;102: 1934–1942)

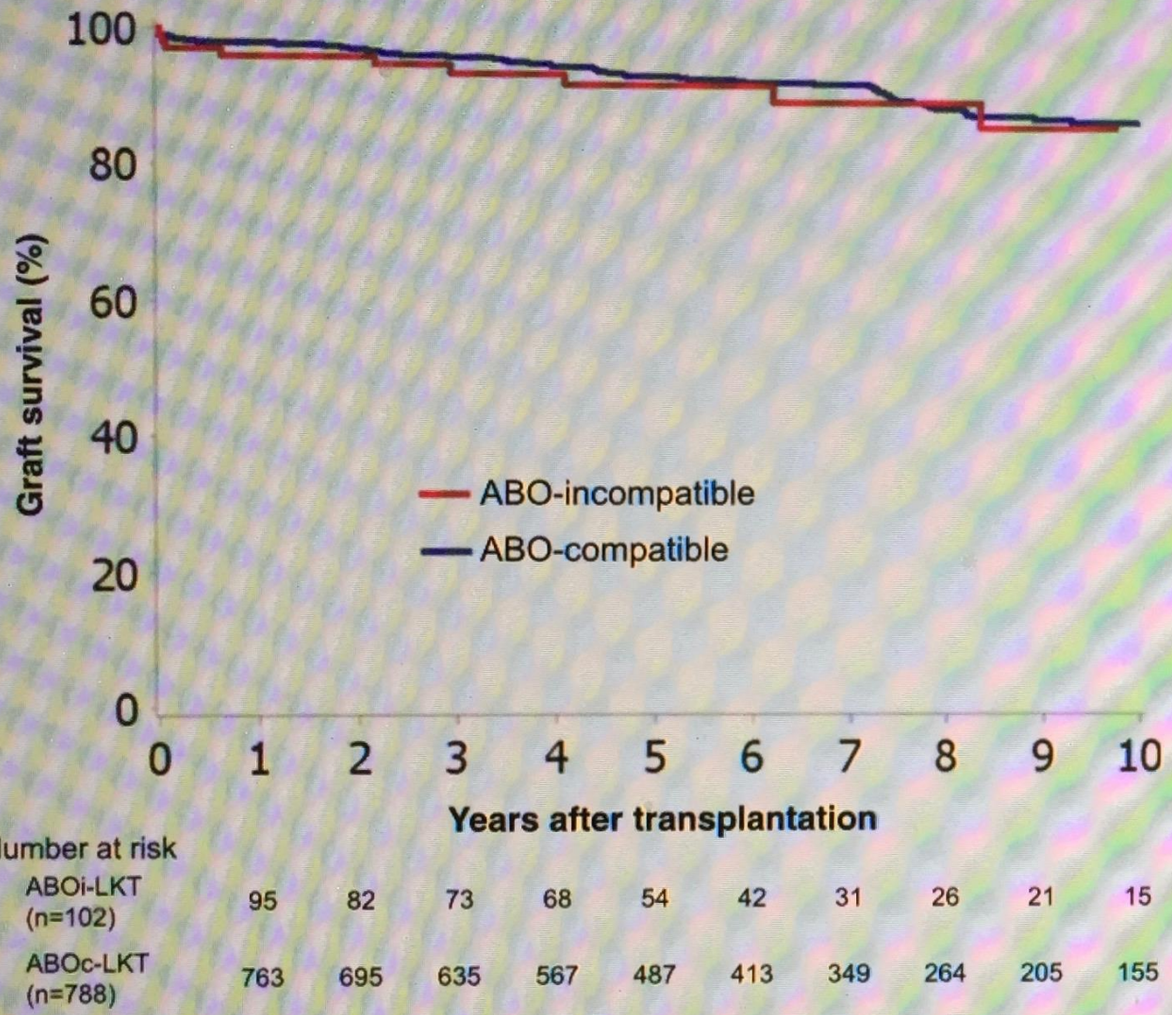



**FIGURE 4.** Graft survival after LKT (noncensored for death) by comparing ABOi and ABOc recipients.

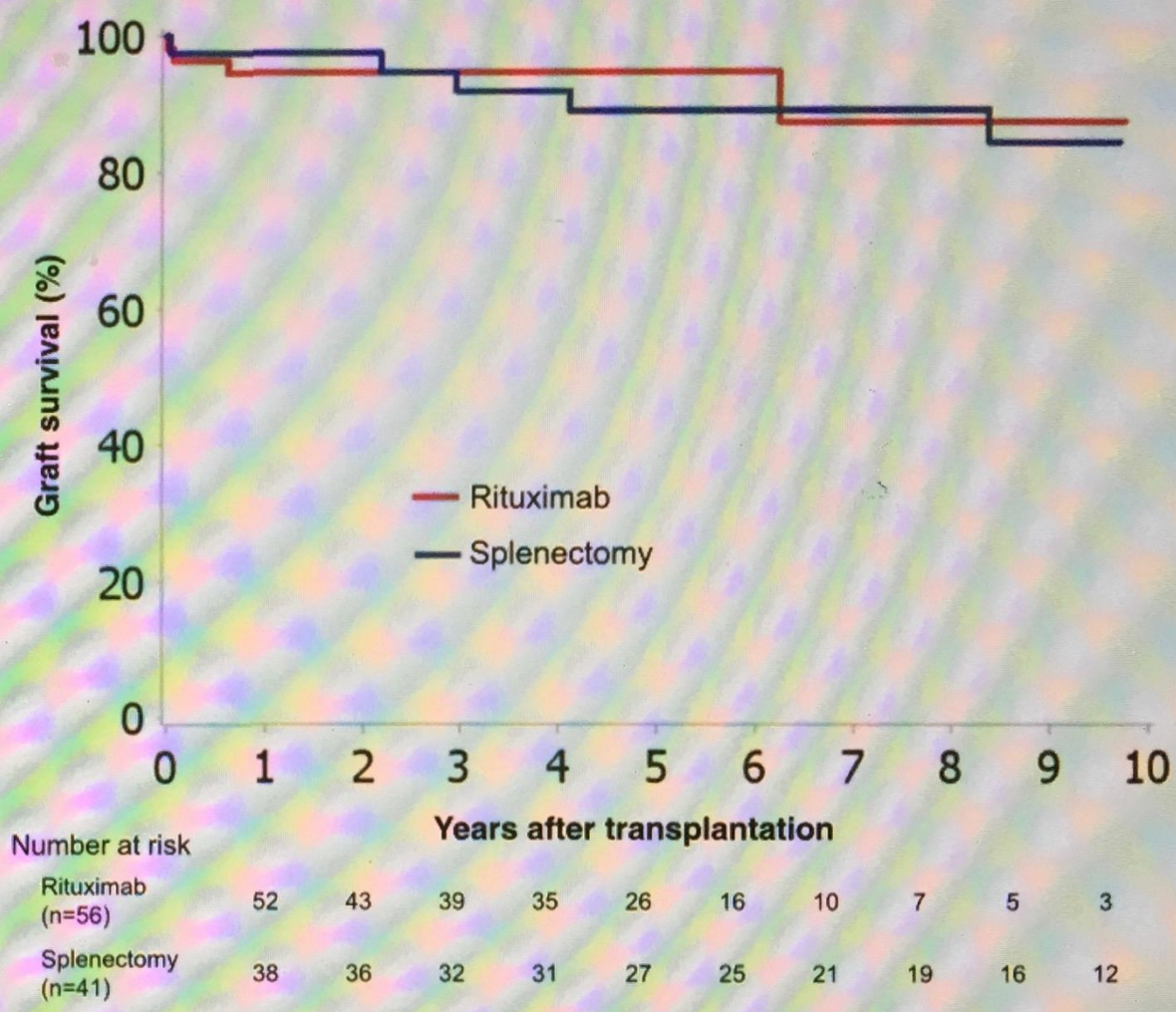


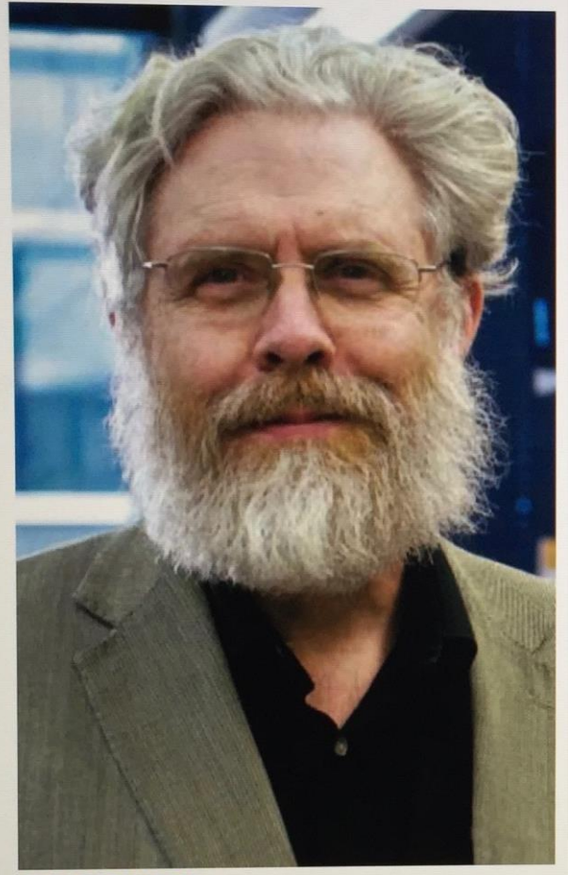

**FIGURE 5.** Graft survival among ABOi living kidney transplant recipients (noncensored for death) by comparing recipients treated with a splenectomy or rituximab.

were 1.56 versus 1.69 events per 100 patient-years. Adjustments for baseline characteristics at the time of transplantation also showed no difference in graft loss between ABOi-LKT re-

infections was not different among the 4 groups. Of note, none of the ABOi and ABOc recipients examined in this study developed invasive CMV disease, which is in line

# Gentechnik
# Regenerative Medicine

# George Church



**GEORGE CHURCH**
Professor of Genetics, Harvard Medical School, Boston,

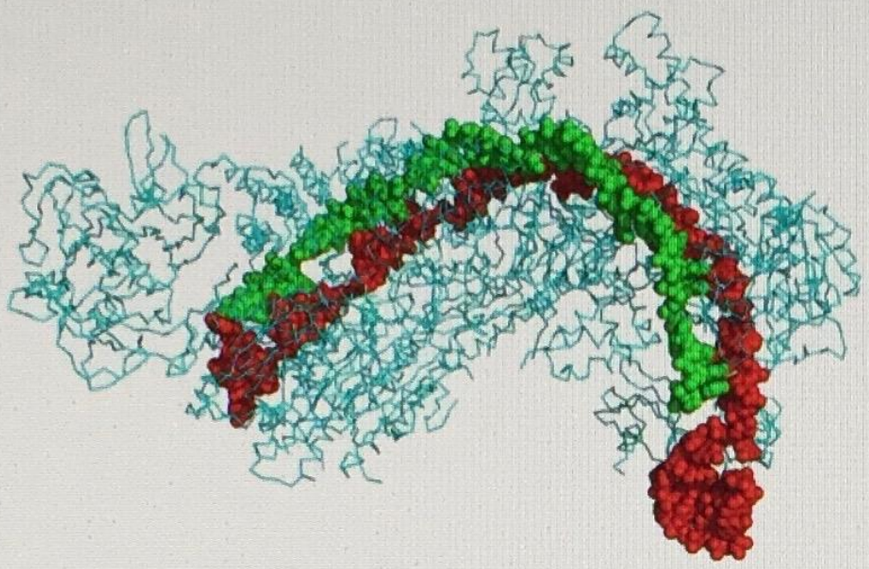
## Greatest Hits

- Developed the first direct genome sequencing and DNA multiplexing methods that led to the first bacterial genome sequence in 1994 and, in 2003, to next-generation methods
- Spearheaded the Personal Genome Project, a way to engage the public in genomic and health data sharing
- As part of the BRAIN initiative, developed ways to encode data in DNA formats, including temporal records of events in living cells
- Intertwined genome reading and writing technologies that led to the largest (~4 million base pairs) synthetically engineered (recoded *E. coli*) genome to date
- Pioneered applications of CRISPR for organ transplants, aging reversal, and gene drives to eliminate malaria and Lyme disease

**Keywords:**

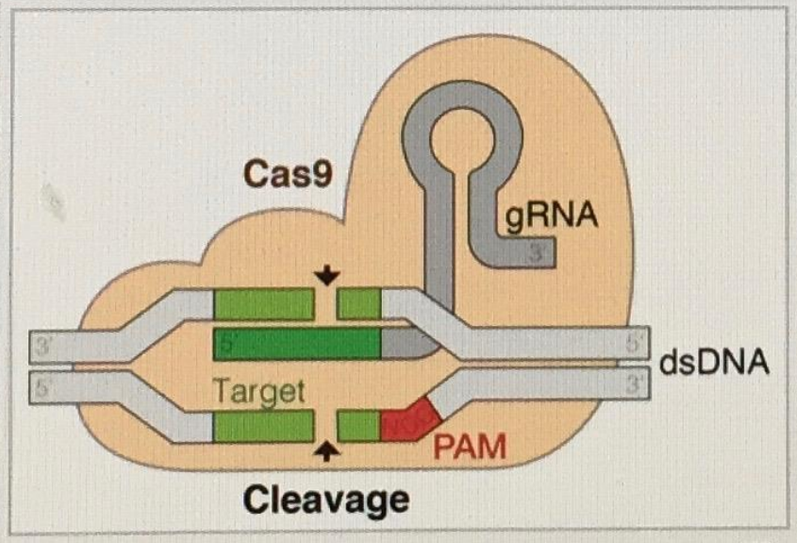
CRISPR/Cas, genetics & genomics, genome editing, genome sequencing, Genome-Project Write, next-gen sequencing, profile, synthetic biology

**Cascade (CRISPR-associated complex for antiviral defense)**



CRISPR Cascade protein (cyan) bound to CRISPR RNA (green) and viral DNA (red)

| Identifiers | |
|---|---|
| **Organism** | Escherichia coli |
| **Symbol** | CRISPR |
| **PDB** | 4QYZ |




CRISPR/Cas9

# CRISPR

Clustered regularly interspaced short palindromic repeats

nature protocols

PROTOCOL

https://doi.org/10.1038/s41596-018-0007-8

# Directed differentiation of human induced pluripotent stem cells into mature kidney podocytes and establishment of a Glomerulus Chip

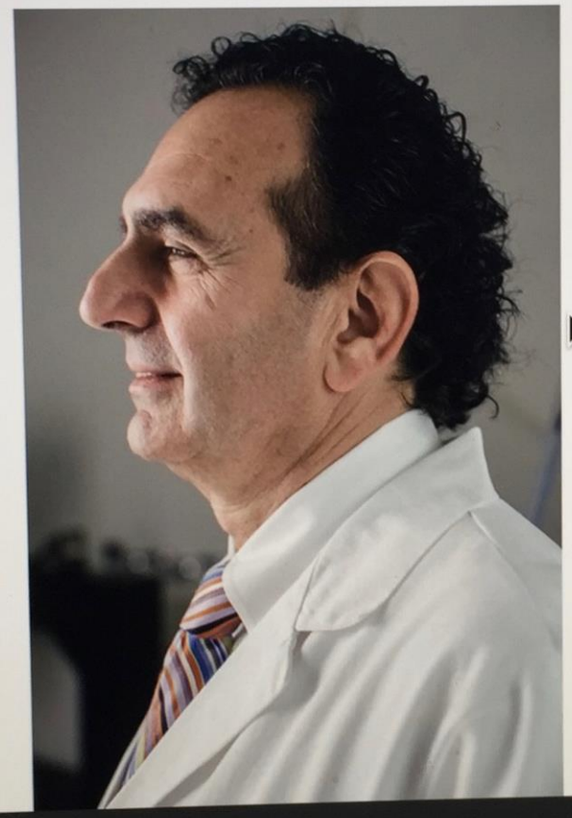
Samira Musah[1,2], Nikolaos Dimitrakakis[1], Diogo M. Camacho[1], George M. Church[1,2] and Donald E. Ingber[1,3,4*]

**Protocols have been established to direct the differentiation of human induced pluripotent stem (iPS) cells into nephron progenitor cells and organoids containing many types of kidney cells, but it has been difficult to direct the differentiation of iPS cells to form specific types of mature human kidney cells with high yield. Here, we describe a detailed protocol for the directed differentiation of human iPS cells into mature, post-mitotic kidney glomerular podocytes with high (>90%) efficiency within 26 d and under chemically defined conditions, without genetic manipulations or subpopulation selection. We also describe how these iPS cell–derived podocytes may be induced to form within a microfluidic organ-on-a-chip (Organ Chip) culture device to build a human kidney Glomerulus Chip that mimics the structure and function of the kidney glomerular capillary wall in vitro within 35 d (starting with undifferentiated iPS cells). The podocyte differentiation protocol**

# Need a New Organ? Surgeon Anthony Atala Sees a Future Where You Can Simply Print It Out

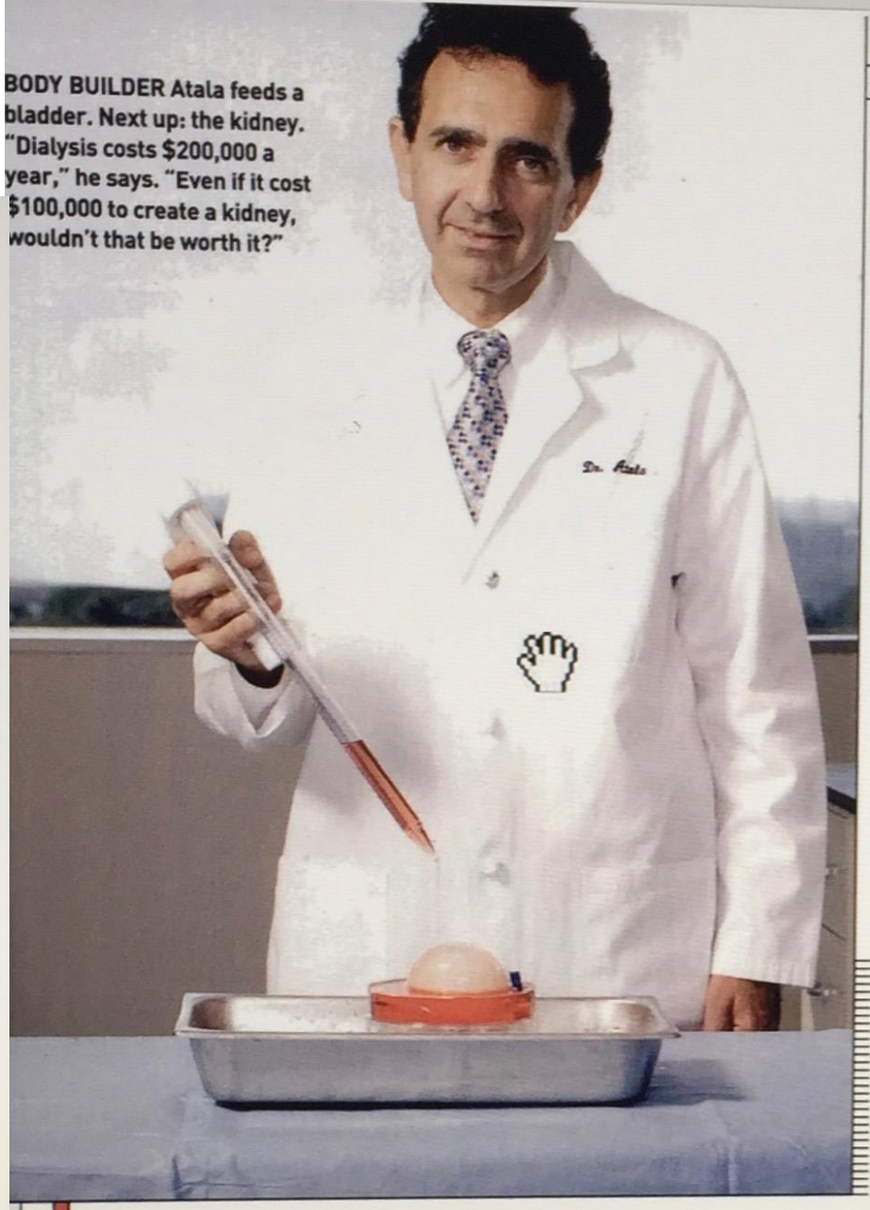
When you can order a new body part online, you'll have this doctor to thank





Anthony Antala (Alex Boerner)





**BODY BUILDER** Atala feeds a bladder. Next up: the kidney. "Dialysis costs $200,000 a year," he says. "Even if it cost $100,000 to create a kidney, wouldn't that be worth it?"

POPSCI INNOVATOR

# The Organ Farmer

## A doctor's quest to grow body parts from scratch could spell the end of waiting lists

**ANTHONY ATALA MAKES BLADDERS.** Not the plastic-model kind but actual living, human organs. Step into his office at Wake Forest University's Institute for Regenerative Medicine (IRM), where the 48-year-old tissue engineer is director, and you'll find a suite of climate-controlled chambers the size of hotel mini fridges. Inside, spheres of human bladder cells resembling deflated pink balloons divide and grow. Culled from patients with incontinence problems, these cells will assemble themselves over time, forming into brand-new replacement bladders for the cell donors.

Atala has been developing the procedure for 16 years, but he became the toast of the industry this year when he announced the first successful transplant of lab-grown organs into humans. Seven volunteers received the organs—new bladders—beginning in 1999, and today all report improved urinary control. Although the bladder is perhaps the simplest organ to replicate because it lacks blood vessels, Atala's achievement paves the way for creating far more complex body parts, such as livers and kidneys. "The current organ shortage is a public health crisis," he says. "People are living longer, and there aren't enough organs to go around. That brings up the question, 'Can we grow them instead?' "

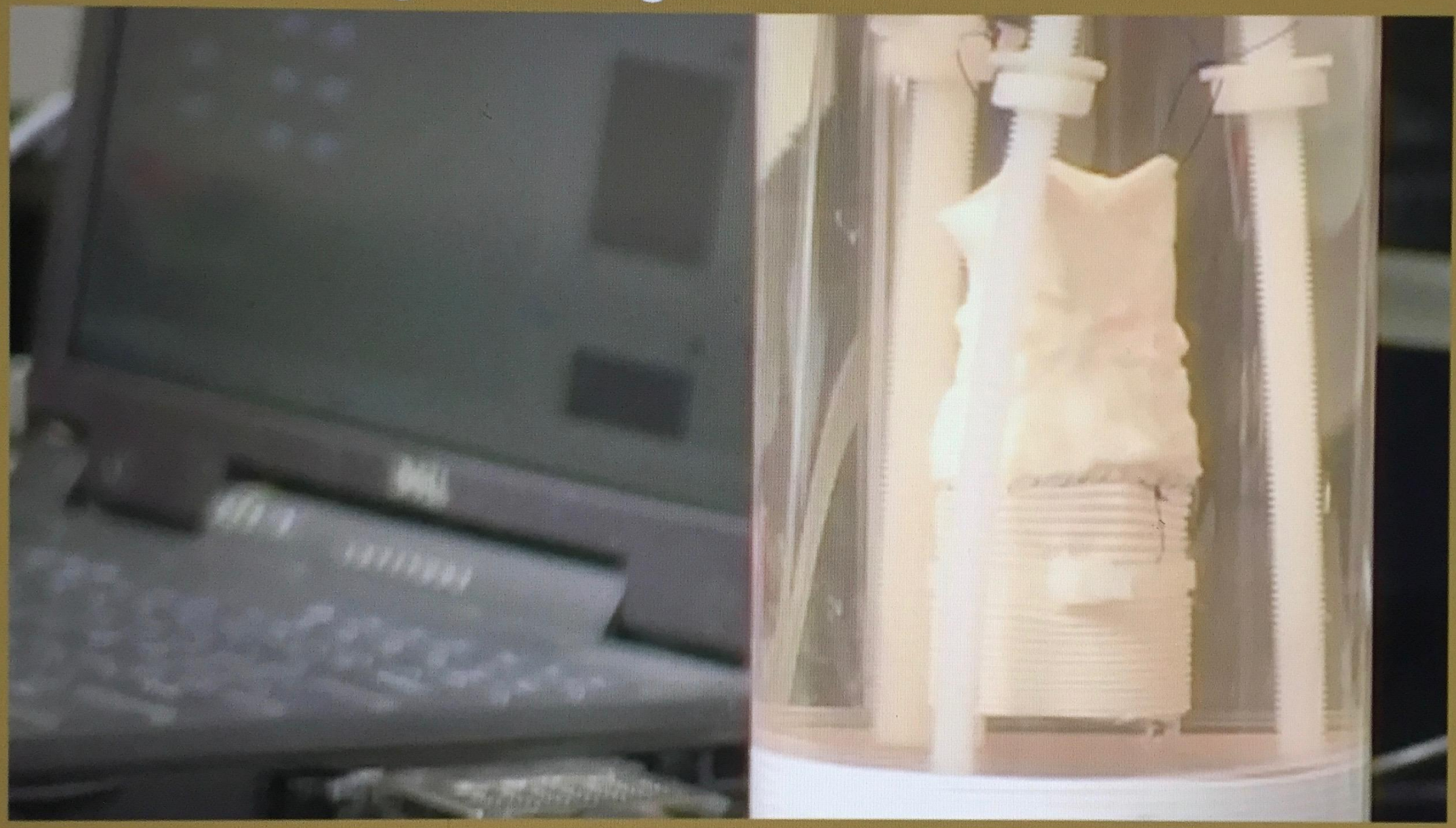
Atala has been wrestling with that very question for 20 years. The soft-spoken researcher attended medical school at the University of Louisville, where he specialized in urology. Struck by the ineffectiveness of standard bladder-repair procedures—intestinal tissue grafts that heightened cancer risks—he resolved to improve on the technique. In 1990 he became a research fellow at Children's Hospital in Boston and set about developing a prototype for the first homegrown bladder. Like others working

**"PEOPLE ARE LIVING LONGER, AND THERE AREN'T ENOUGH ORGANS TO GO AROUND."**

on similar tissue-engineering projects, he kept facing the same bugaboo: When he tried to grow bladder cells outside the body, they would divide and grow for only a few days or weeks before dying off. After years of trial and error, he hit on a solution: harvesting younger cells. "We used the layer of cells at the very, very base of the bladder," he explains. "Once we started working with them, we were able to grow enough bladder cells to cover a football field in 60 days."

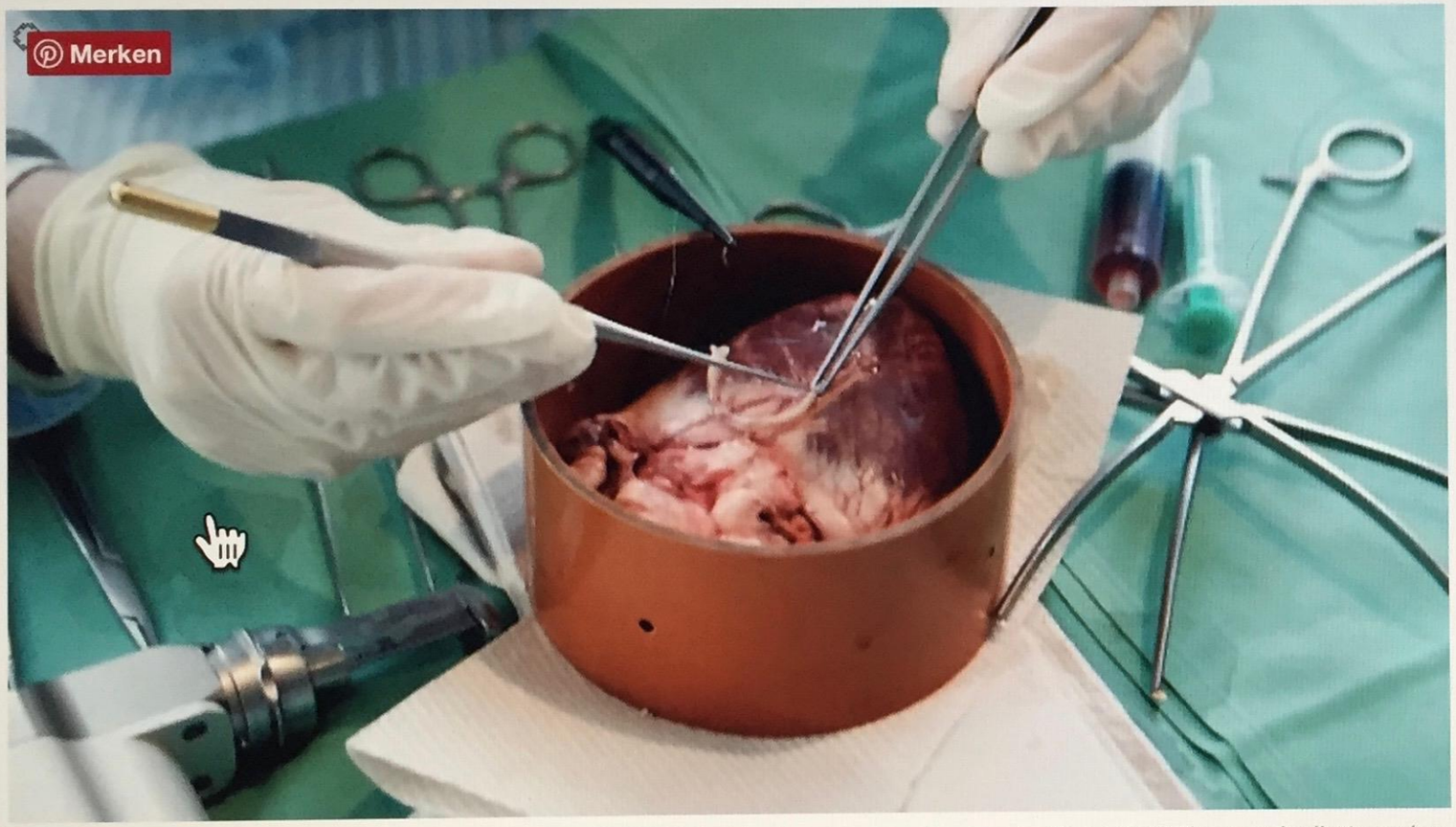
The IRM is now collaborating with local biotech company Tengion, which is bankrolling large-scale clinical trials of Atala's bladders and hopes to manufacture them eventually. Meanwhile, Atala is busy replicating more than 20 kinds of tissues and organs, including hearts and livers. But because the vast snarls of blood vessels inside these organs are exceedingly difficult to grow in the lab, he thinks it might be decades before his work yields commercially viable treatments. "Rushing may be OK when you're trying to get a widget or a videogame on the market," he says, "but not when you're dealing with patients' lives."—ELIZABETH SVOBODA

# Engineering a Heart Valve



WAKE FOREST INSTITUTE FOR REGENERATIVE MEDICINE

WISSEN




Die Schweineherzen mussten vor der Transplantation manipuliert werden. (Foto: dpa)

Mittwoch, 05. Dezember 2018

## Fortschritte bei Organspende

# Pavian überlebt halbes Jahr mit Schweineherz

**Im Rahmen einer Studie transplantiert ein deutsches Forscherteam Schweineherzen in die Körper von fünf Pavianen. Mit Erfolg: Die Affen vertragen die neuen Organe. Die Experten sprechen von einem Meilenstein für die Zukunft der Organspende für Menschen.**

VIDEOS

WISSEN 05.12.18 – 01:27 min

Fünf-Stunden-OP für ein neues Lächeln

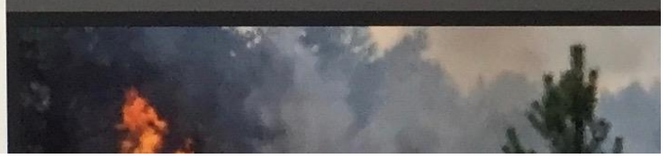
**Australierin erhält Oberkiefer aus dem 3D-Drucker**

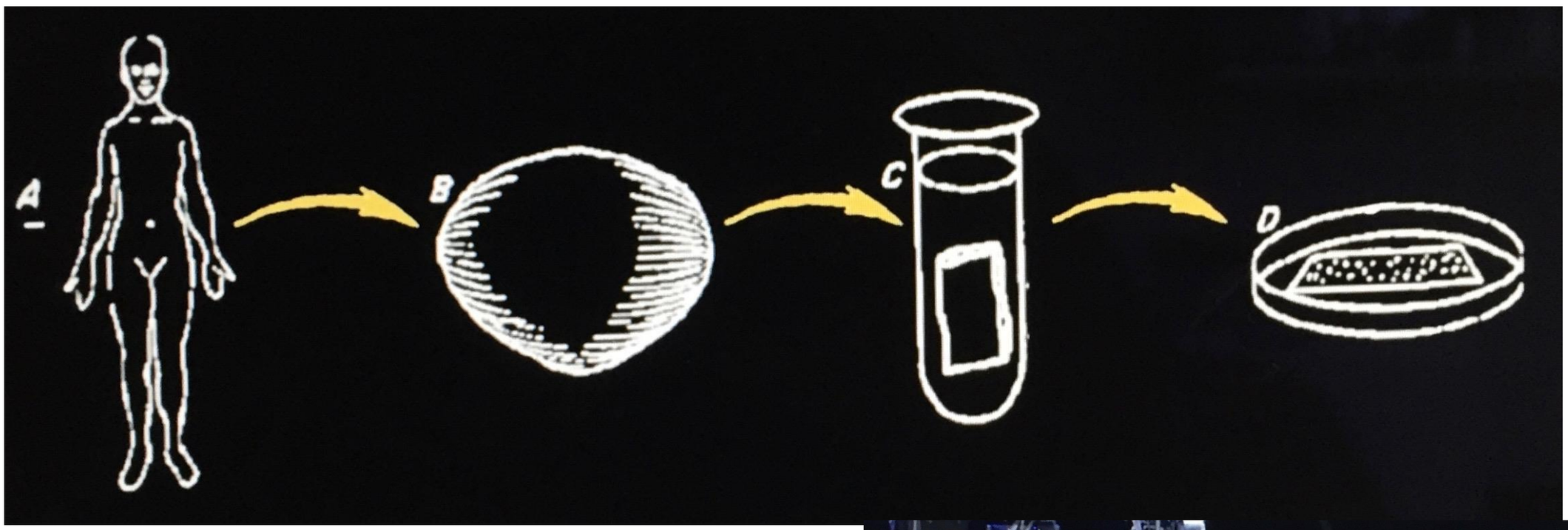
WISSEN 04.12.18 – 00:35 min

Zwei Monate nach Sojus-Fehlstart

**Ablösung für Alexander Gerst erreicht ISS**

BILDERSERIEN

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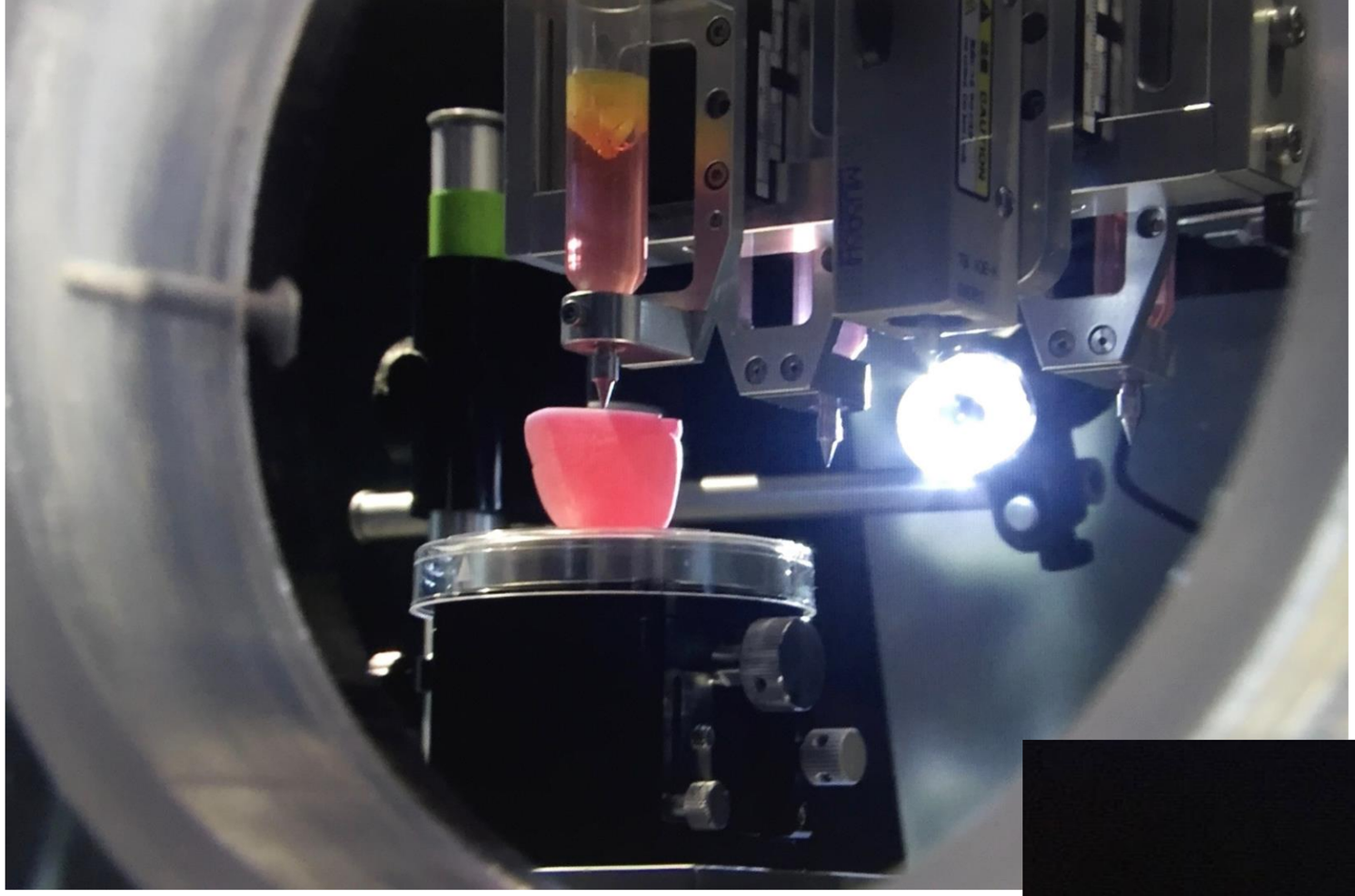
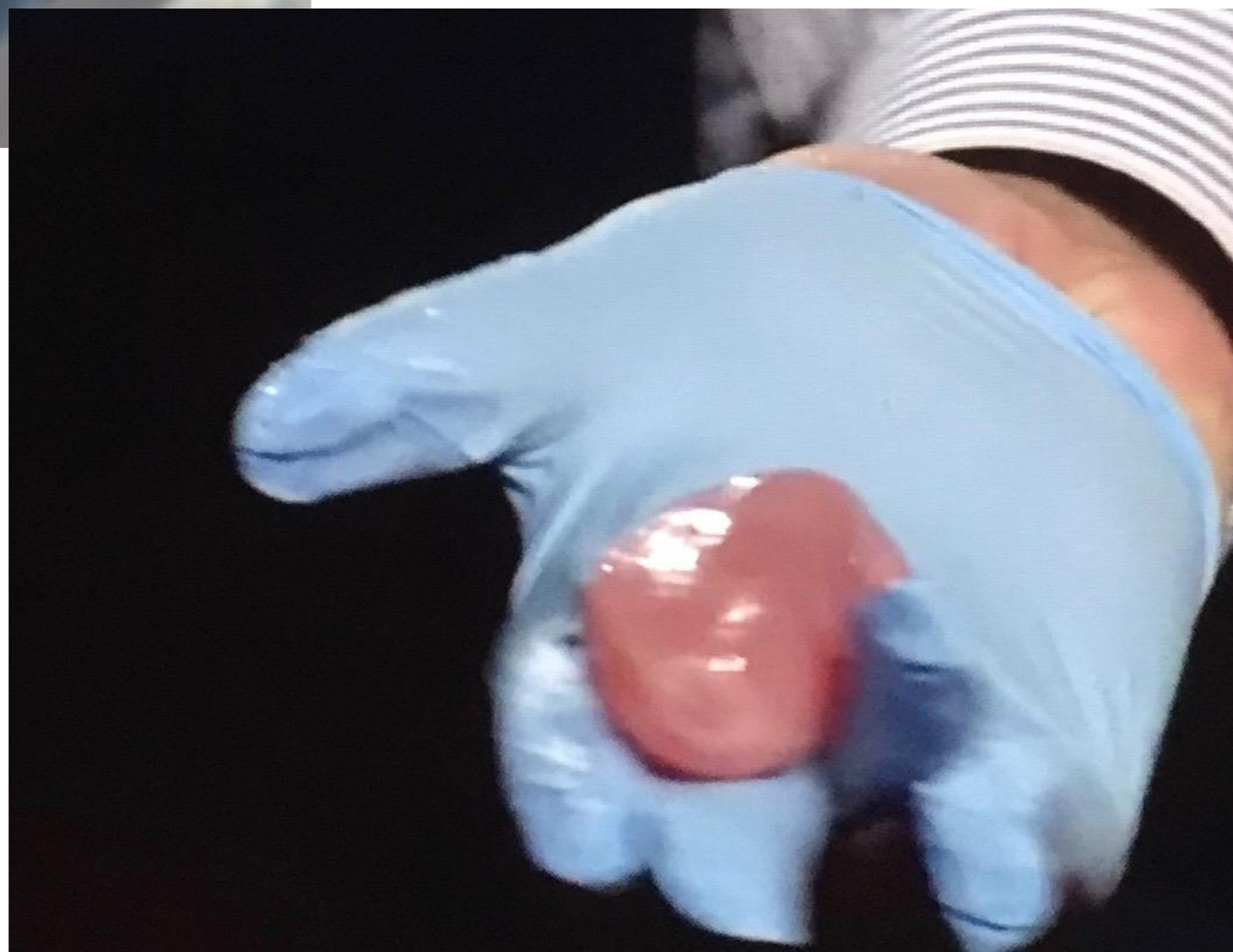
Anthony Atala | TED2011
Printing a human kidney





# Todesfeststellung

# Critical pathways for organ donation from ventilated patients

## POSSIBLE DECEASED ORGAN DONOR*

Mechanically ventilated patient with a devastating brain injury or lesion, apparently medically suitable for organ donation

**NOTE**: *The "dead donor rule" must be respected. That is, patients may only become donors after death, and the recovery of organs must not cause a donor's death.*

Treating physician
to identify/refer a potential donor

## Donation after Circulatory Death (*DCD*)

### POTENTIAL *DCD* DONOR

A person in whom the cessation of circulatory and respiratory functions is anticipated to occur within a time frame that will enable organ recovery.

### ELIGIBLE *DCD* DONOR

A medically suitable person who has been declared dead based on the irreversible absence of circulatory and respiratory functions as stipulated by the law of the relevant jurisdiction, within a time frame that enables organ recovery.

### ACTUAL *DBD* DONOR

A consented eligible donor:
A.In whom an operative incision was made with the intent of organ recovery for the purpose of transplantation.
**and/or**
B.From whom at least one organ was recovered for the purpose of transplantation.

### UTILIZED *DCD* DONOR

An actual donor from whom at least one organ was transplanted.

## Reasons why a potential donor does not become a utilized donor

**System**

- *Failure to identify/refer a potential or eligible donor*
- *Brain death diagnosis could not be confirmed (e.g does not fulfill criteria) or completed (e.g., lack of technical resources or clinician to make diagnosis or perform confirmatory tests)*
- *Circulatory death not declared within the appropriate time frame.*
- *Logistical problems (e.g. no recovery team)*
- *Lack of appropriate recipient (e.g. child, blood type, serology positive)*

**Donor/Organ**

- *Medical unsuitability (e.g. serology positive, neoplasia)*
- *Haemodynamic instability / unanticipated cardiac arrest*
- *Anatomical, histological and/or functional abnormalities of organs*
- *Organs damaged during recovery*
- *Inadequate perfusion of organs or thrombosis*

**Permission**

- *Expression intent of deceased not to be donor*
- *Relative's refusal of permission for organ donation*
- *Refusal by coroner or other judicial officer to allow donation for forensic reasons*

## Donation after BrainDeath (*DBD*)

### POTENTIAL *DBD* DONOR

A person whose clinical condition is suspected to fulfill brain death criteria.

### ELIGIBLE *DBD* DONOR

A medically suitable person who has been declared dead based on neurologic criteria as stipulated by the law of the relevant jurisdiction.

### ACTUAL *DBD* DONOR

A consented eligible donor:
A.In whom an operative incision was made with the intent of organ recovery for the purpose of transplantation.
**and/or**
B.From whom at least one organ was recovered for the purpose of transplantation.

### UTILIZED *DBD* DONOR

An actual donor from whom at least one organ was transplanted.

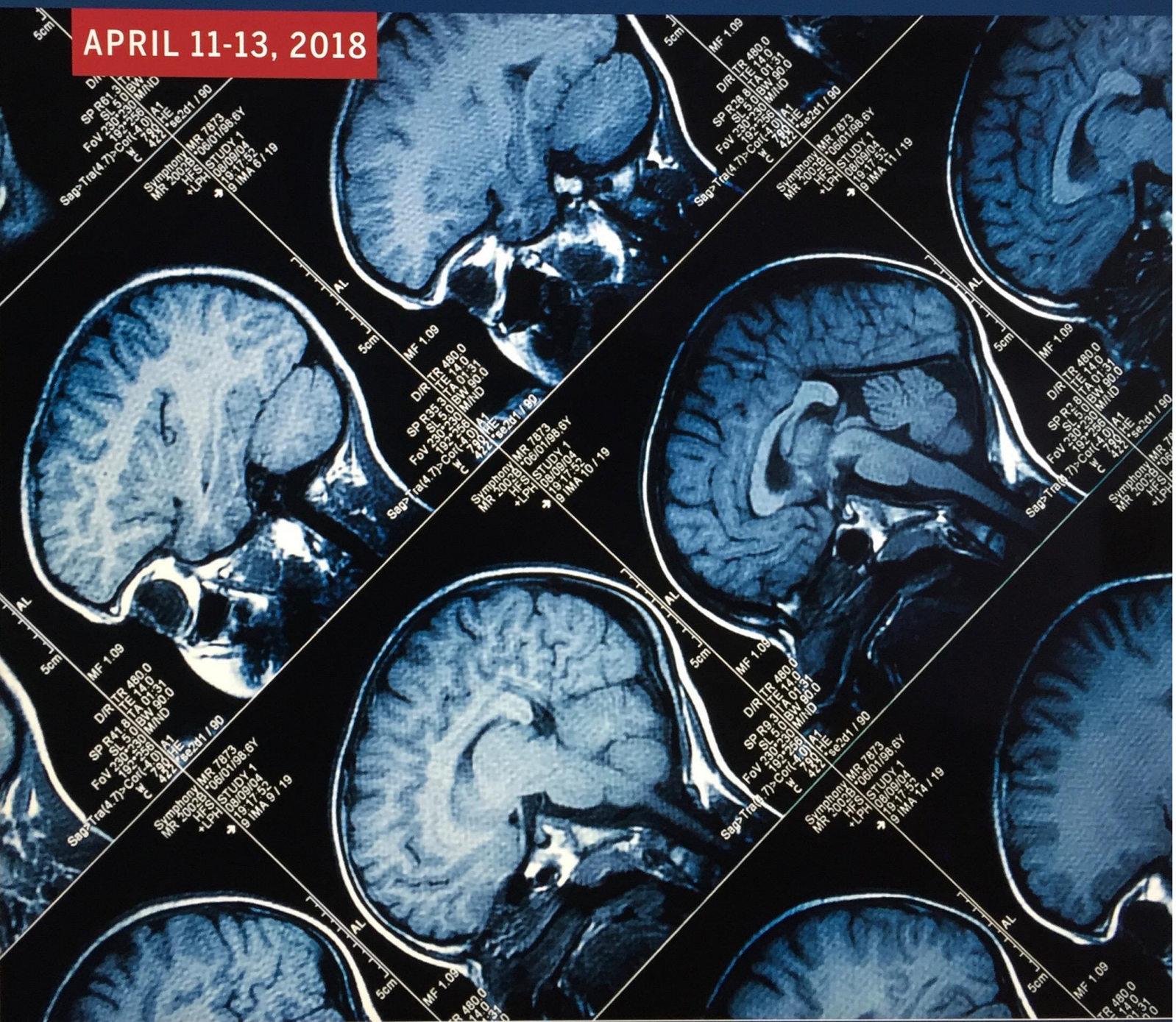
*Organ donation may occur from patients whose circulatory death is not anticipated and from patients with no devastating brain injury*

Harvard Medical School Annual Bioethics Conference

# DEFINING DEATH

## Organ transplantation and the 50-year legacy of the Harvard report on brain death

**APRIL 11-13, 2018**



# The biology of brain injury

Uninjured brain

Minimally conscious state

Permanent vegetative state

Brain death

Necrotic (liquefied) brain


Intermittently or partially conscious

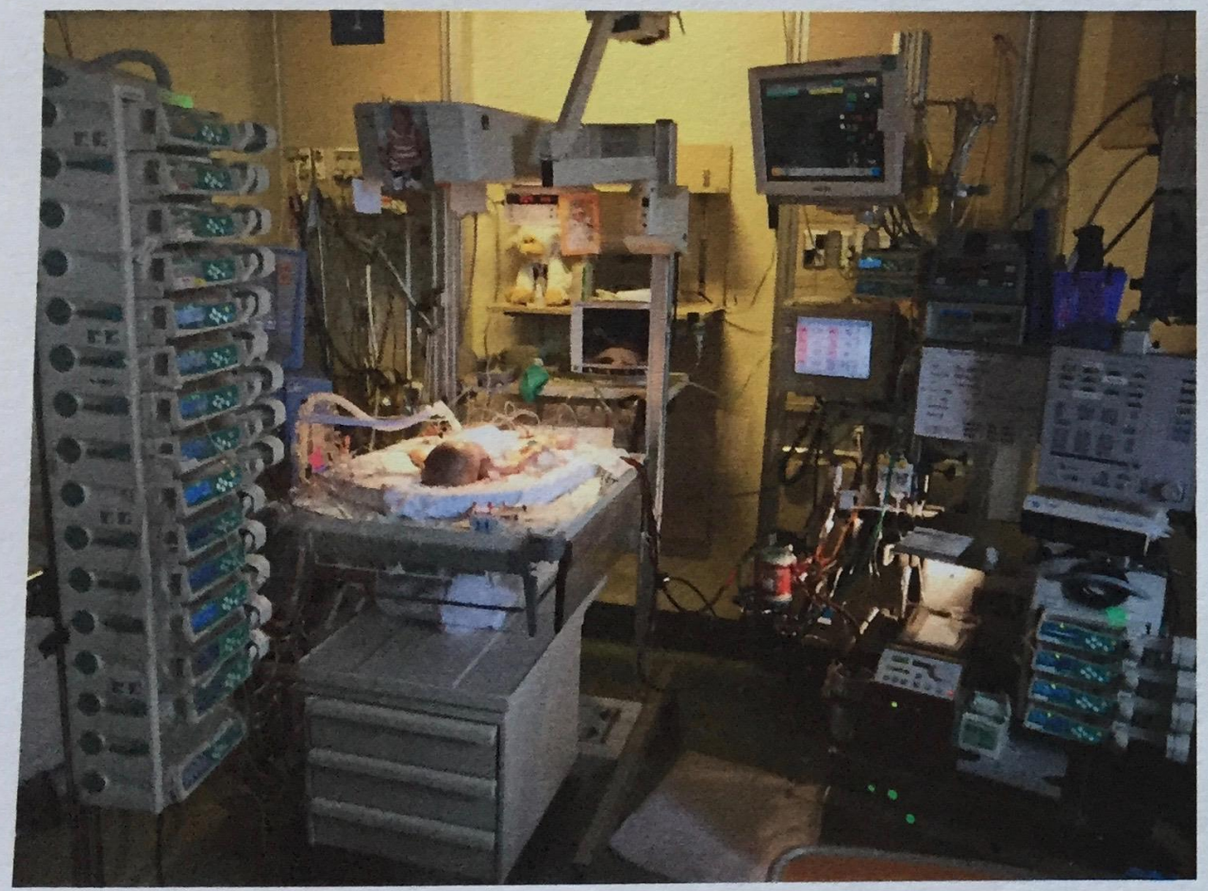
Irreversible unconsciousness

Irreversible apneic unconsciousness

No function

CENTER FOR BIOETHICS
HARVARD MEDICAL SCHOOL

**While the 'line' between life and death continues to be contested, organ replacement technologies *have profoundly changed our biological understanding of life and death.***



**ECMO**

**Ventricular Assist Devices (e.g. Berlin Heart)**

Canadian Blood Services
Société canadienne du sang

2012

# International Guidelines for the Determination of Death –

# Operational Definition of Human Death

"Death occurs when there is permanent loss of capacity for consciousness and loss of all brainstem functions. This may result from permanent cessation of circulation and/or after catastrophic brain injury.

In the context of death determination, 'permanent' refers to loss of function that cannot resume spontaneously and will not be restored through intervention."

2012

## GRAFIK

### Diagnostik des irreversiblen Hirnfunktionsausfalls ab Beginn des dritten Lebensjahres

**I. Voraussetzungen**
- akute schwere Hirnschädigung
- keine anderen Ursachen der Ausfallsymptome des Gehirns

↓

**II. klinische Symptome**
Koma
+
Hirnstamm-Areflexie*1
+
Apnoe*2

↓

**III. Irreversibilitätsnachweis***3

| primäre supratentorielle Hirnschädigung | sekundäre Hirnschädigung | primäre infratentorielle Hirnschädigung |
|---|---|---|
| sofort | nach ≥ 12 h / sofort | nach ≥ 72 h | obligat, keine Wartezeit erforderlich |
| **ergänzende Untersuchung** (EEG, SEP oder FAEP, Doppler-/Duplexsonografie, Perfusionsszintigrafie, CT-Angiografie*4) | **klinische Symptome** Koma + Hirnstamm-Areflexie + Apnoe*2 | **ergänzende Untersuchung** (EEG, Doppler-/Duplexsonografie, Perfusionsszintigrafie, CT-Angiografie*4) |

### Diagnostik des irreversiblen Hirnfunktionsausfalls bis zum vollendeten zweiten Lebensjahr

**I. Voraussetzungen**
- Alter ≥ 37 Schwangerschaftswochen postmenstruell
- akute schwere Hirnschädigung
- keine anderen Ursachen der Ausfallsymptome des Gehirns

↓

**II. klinische Symptome**
Koma
+
Hirnstamm-Areflexie
+
Apnoe*2

**und**

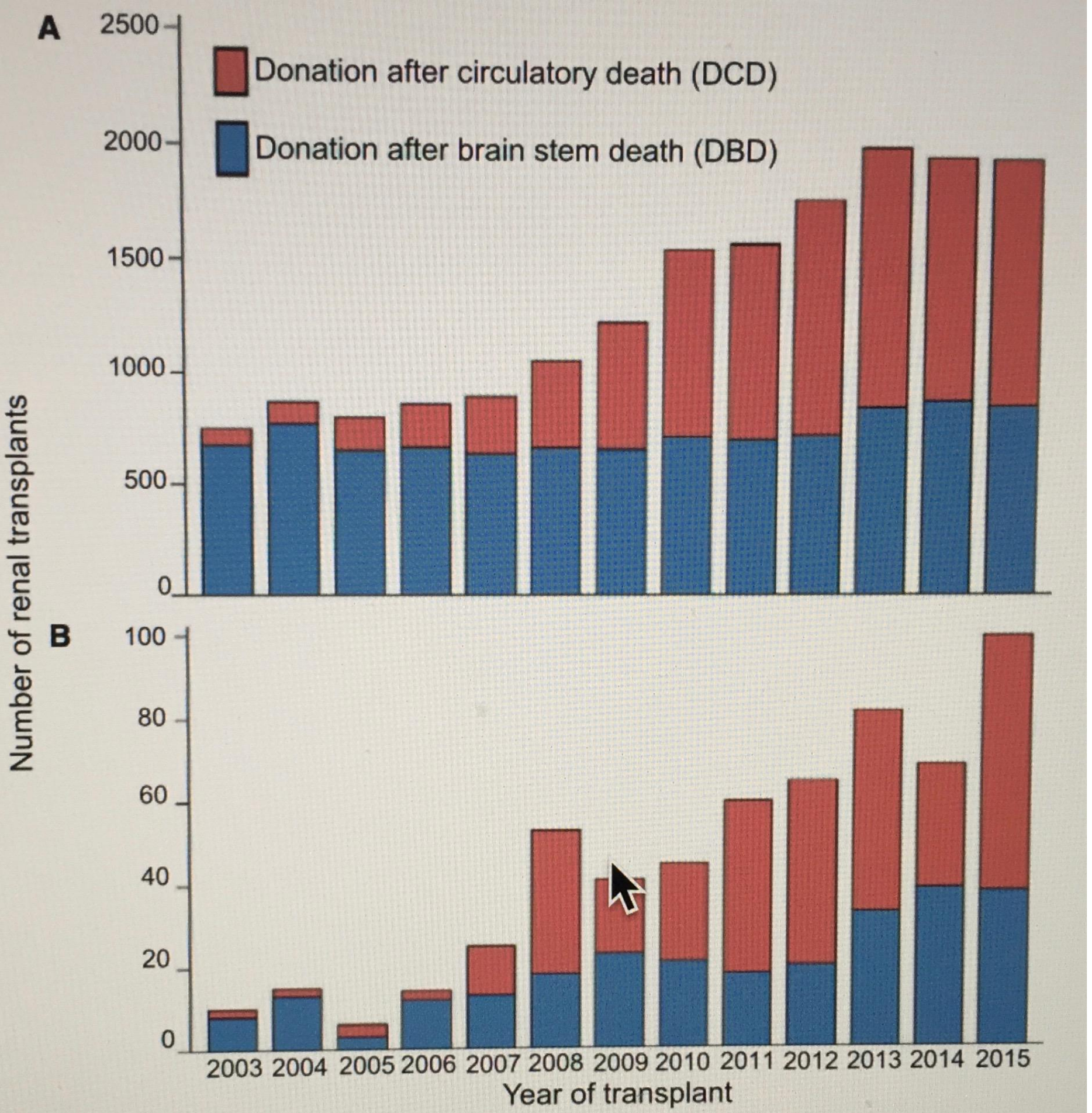
**II. ergänzende Untersuchung**
(EEG, FAEP, Doppler-/Duplexsonografie, Perfusionsszintigrafie*5)

↓

**III. Irreversibilitätsnachweis** (klinisch und apparativ)

| Neugeborenes bis 28 Tage | Kind 29 Tage bis vollendetes zweites Lebensjahr |
|---|---|
| nach ≥ 72 h | nach ≥ 24 h |
| **klinische Symptome** Koma + Hirnstamm-Areflexie + Apnoe*2 | **und** | **ergänzende Untersuchung** (EEG, FAEP, Doppler-/Duplexsonografie, Perfusionsszintigrafie*5) |

2018


A
B
Donation after circulatory death (DCD)
Donation after brain stem death (DBD)
Number of renal transplants
2500
2000
1500
1000
500
0
100
80
60
40
20
0
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year of transplant

# Ethische Herausforderungen

ELSEVIER

# Crossover Renal Transplantation: Hurdles to Be Cleared!

G. Thiel, P. Vogelbach, L. Gürke, T. Gasser, K. Lehmann, T. Voegele, A. Kiss, and G. Kirste

UNRELATED living kidney donor transplantation, or better, emotionally related donation, is becoming increasingly popular. The main reasons are (1) the increasing demand for renal transplantation, (2) the good results of emotionally donated kidney transplantation, (3) the high motivation to donate a kidney to the sick spouse, and (4) the stagnating or even decreasing supply of cadaveric organs.

The numerical trend in the international CTS Study kindly supplied by Prof. G. Opelz shows decreasing numbers between 1988 and 1998 for cadaveric (minus 21%) and live donated related kidney transplantation (minus 16%), but increasing figures for unrelated live donated kidney transplantation (plus 66%) (Table 1). Even if we assume that the decline in cadaveric and living related donor kidney transplantation was mainly due to the lower number of reporting centers, the opposite increase of unrelated living kidney remains remarkable.

Not all countries participate in emotional living kidney donation, owing to profound legislative differences in Europe, where, for example, unrelated emotional living donation is forbidden in France, but accepted in the closest neighboring countries such as Germany, Italy, and Switzerland. Transplantation laws originally designed to avoid abuse and [illegible] with organs may have the unintended

**Table 1. Reported Kidney Grafts in the CTS Study (G. Opelz)**

| Kidneys Grafted and Reported | 1988 | 1998 | % Change |
|---|---|---|---|
| Cadaveric | 21,814 | 17,178 | −21% |
| Related live donors | 4,751 | 3,989 | −16% |
| Unrelated live donors | 896 | 1,484 | 66% |
| Total renal grafts | 27,461 | 22,651 | −18% |

can be bypassed by crossover transplantation, an elegant solution for both pairs.

The idea for such kidney exchange was originally postulated by Felix Rapaport in 1986[3] but experienced only years later in South Korea,[2,4–6] where because of cultural and religious reasons the organ exchange between living donors is easier to accept than the concept of brain death and cadaveric donation.

The contrary was the case in Europe in 1986, where Rapaport's idea had little chance to become accepted, because any form of unrelated living donation was thought to be unethical by most transplant centers. Looking back, the reasons for disapproval were not really based on strong ethical arguments. Adhering to traditional opinion and also some rigidity when confronted with new concepts played a more important role.

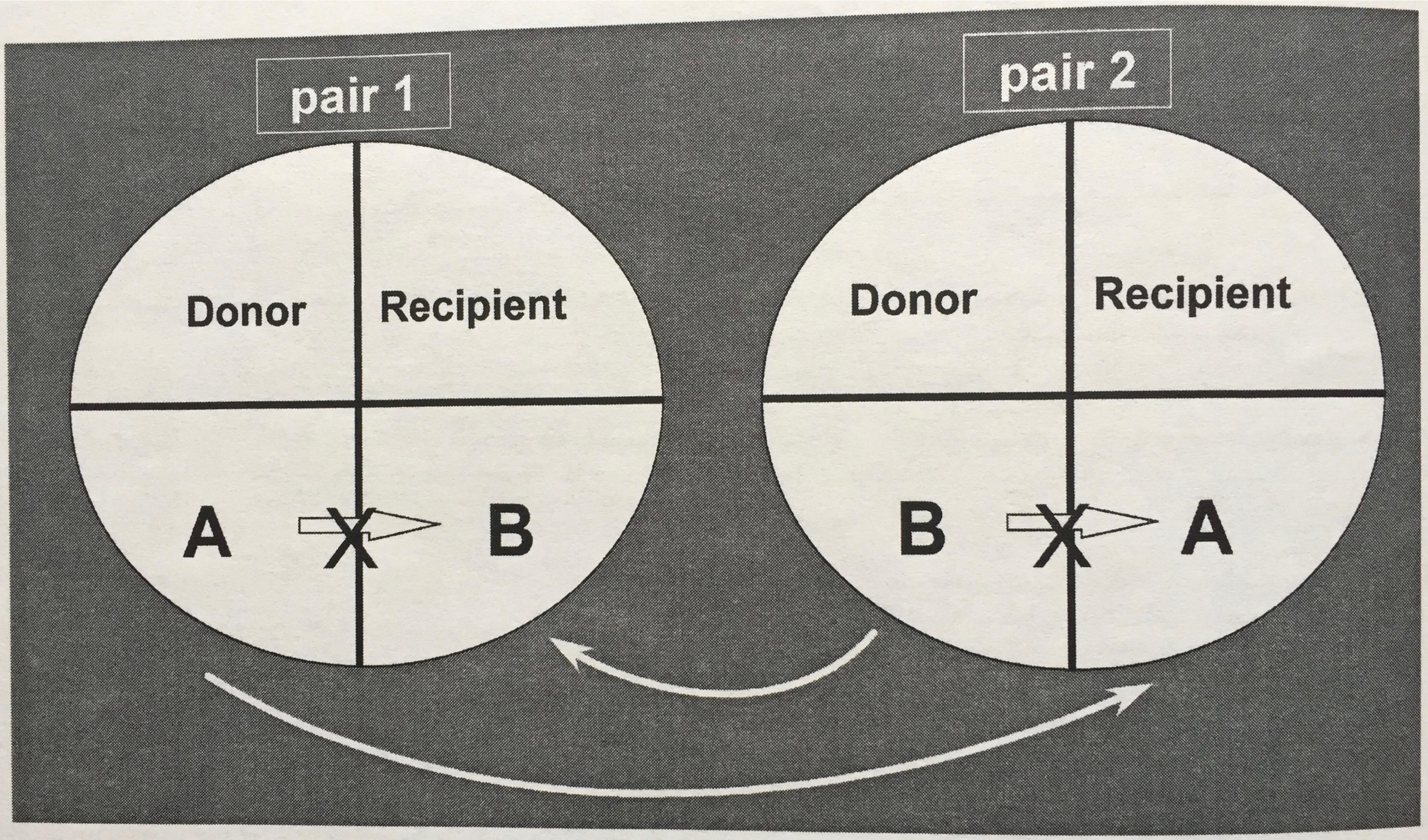



**Fig 1.** Constellation for cross-over transplantation.

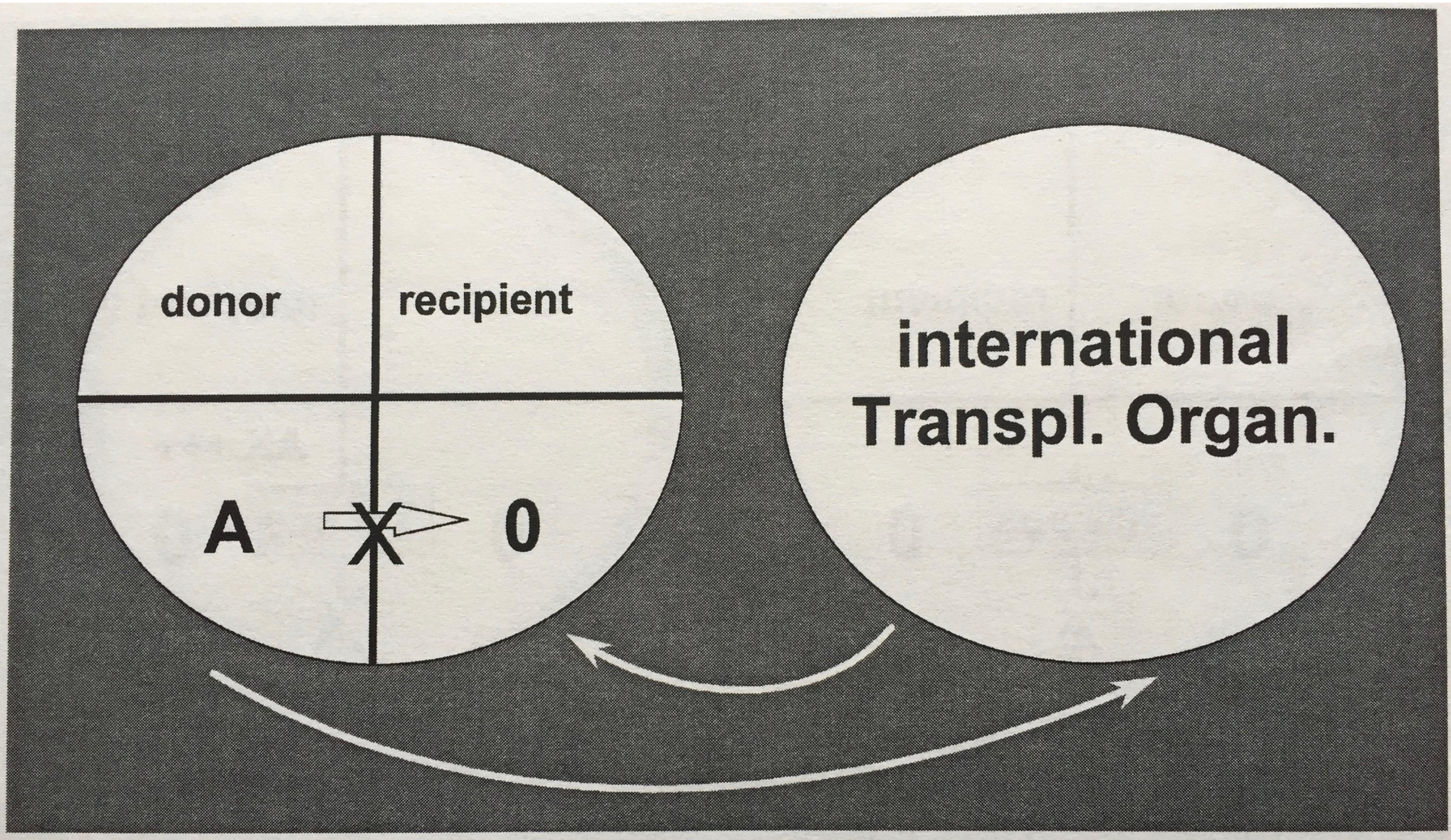
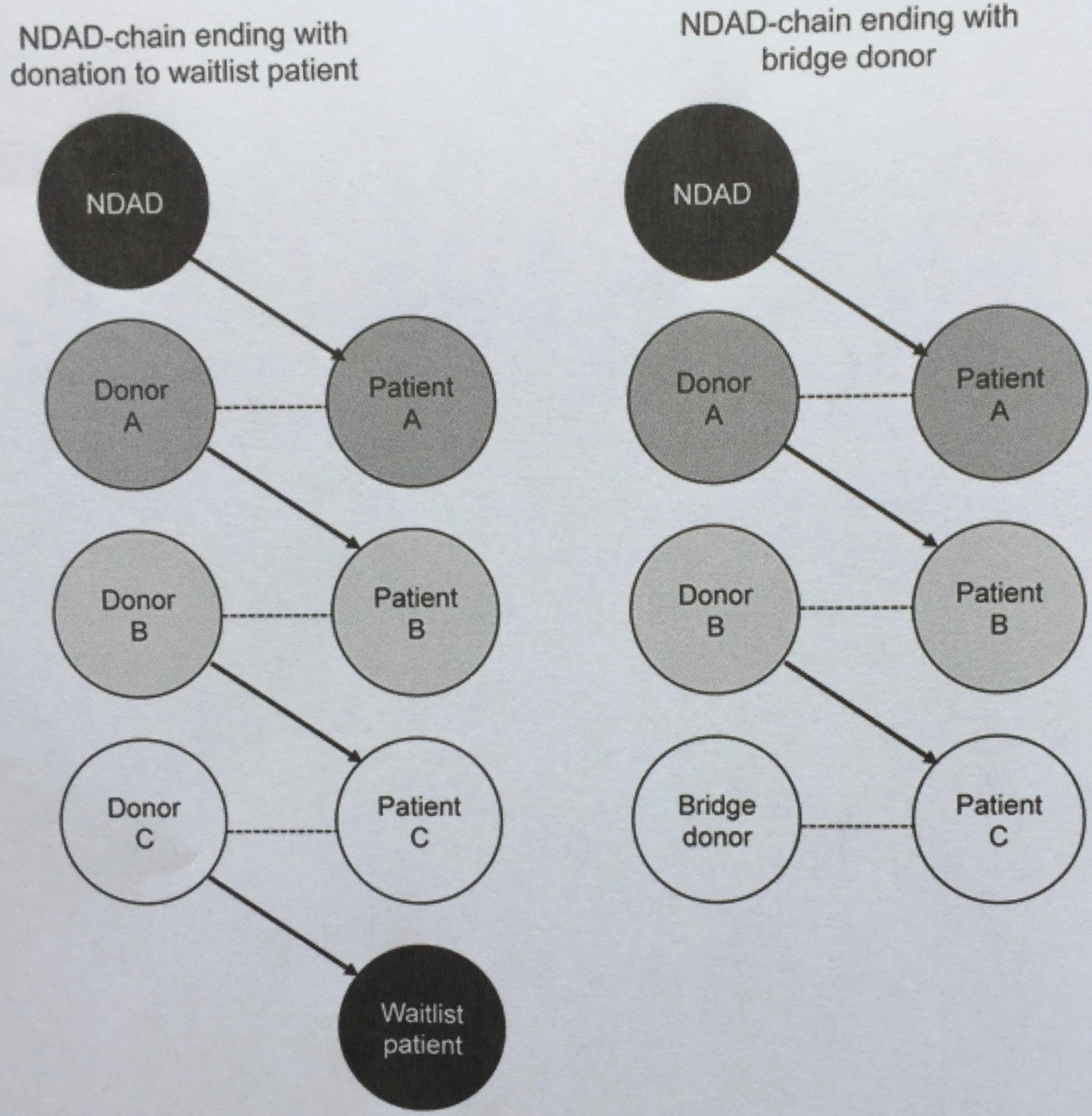


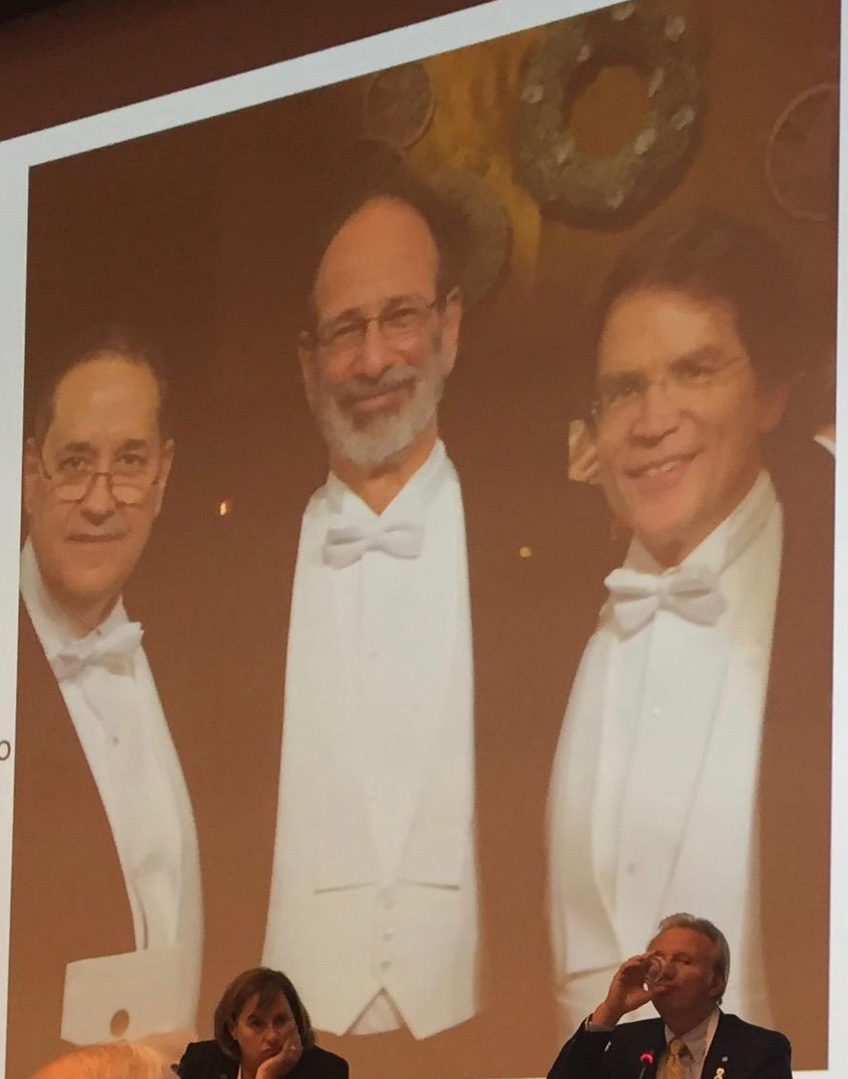

**Fig 4.** Constellation for cross-over transplantation.

**FIGURE 2:**




View large Download slide

Frank
Delmonico



Mike
Rees

51

CICG

# Italy Recommends Global Kidney Exchange to the World Health Organization

In January 2018, Italy recommended a proposal for a global kidney exchange (GKE) to the World Health Organization (WHO).[1] The recommendation was part of a collection of statements submitted by Member States and other participants of the 142nd session of the WHO Executive Board.

Michael Rees, MD, PhD, a kidney transplant surgeon at the University of Toledo Medical Center in Ohio, and Alvin Roth, PhD, a Nobel Prize–winning economist at Stanford University in Palo Alto, California, launched GKE to address the reality that poverty is the biggest global barrier to transplantation and to develop a means for poor people from developing countries to donate and receive organs.[2] At its core, GKE is a system to support transplant surgeons in their efforts to help people who are not only very sick and dying, but also too poor to afford dialysis. The system is also controversial in the transplantation community and has been associated with logistical barriers. Even so, Dr. Rees and Dr. Roth remain dedicated to seeing the system developed and implemented around the world.

The statement from Italy represents a significant endorsement of GKE. It notes that internationally, 2 million to 7 million people die annually from kidney failure, and that kidney disease and other noncommunicable diseases have replaced communicable diseases as the most common causes of premature death worldwide. However, as billions of dollars are spent in low/middle-income countries (LMICs) to reduce the burden of communicable diseases, significantly less is spent on noncommunicable diseases such as kidney failure. The statement asserts that not only is transplantation the preferred treatment for kidney failure, but that kidney exchange makes it possible to extend the reach of living donation, and for healthy living donors whose kidneys are incompatible with loved ones to exchange their kidneys for those that are compatible with the people they love.

The first of Italy's action items stated, "We encourage WHO to include organs and in particular kidney transplantation in its program as we believe that oversight, cooperation and assistance of the WHO to carry out a pilot program with strong international governance that is consistent with the highest ethical and legal standard, and that carefully approves participating countries, facilities, healthcare providers and patient–donor pairs should be conceived and implemented." Italy's statement referred to GKE, noting that such program allows patients to receive a compat ible kidney from another patient's donor. Th statement also noted that the savings attaine in high-income countries could support long term care of the LMIC donor and recipient i their home country.

This request sits in conflict with the 201 Statement of the Declaration of Istanbu Custodian Group concerning ethical objec tions to the proposed GKE Program.[3] AJT

*References*


1. Italian Government. Statement from Italy. WHO, Geneva Switzerland, 2018. Retrieved from http://apps.who.int/gb statements/eb142/PDF/22/Italy-3.1.pdf.
2. Pullen LC. Global kidney exchange: Overcoming the barrier of poverty. *Am J Transplant.* 2017;17:2499-2500.
3. Declaration of Istanbul Custodian Group. Statement o the Declaration of Istanbul Custodian Group Concern ing Ethical Objections to the Proposed Global Kidney Exchange Program. 2017. Retrieved from https:// www.declarationofistanbul.org/resources/policy-documents/795-statement-of-the-declaration-of-istanbul-custodian-group-concerning-ethical-objections-to-the-proposed-global-kidney-exchange-program.

# The Declaration of Istanbul
## on Organ Trafficking and Transplant Tourism

Original Clinical Science—General

2018

# Deceased Donor Organ Transplantation Performed in the United States for Noncitizens and Nonresidents

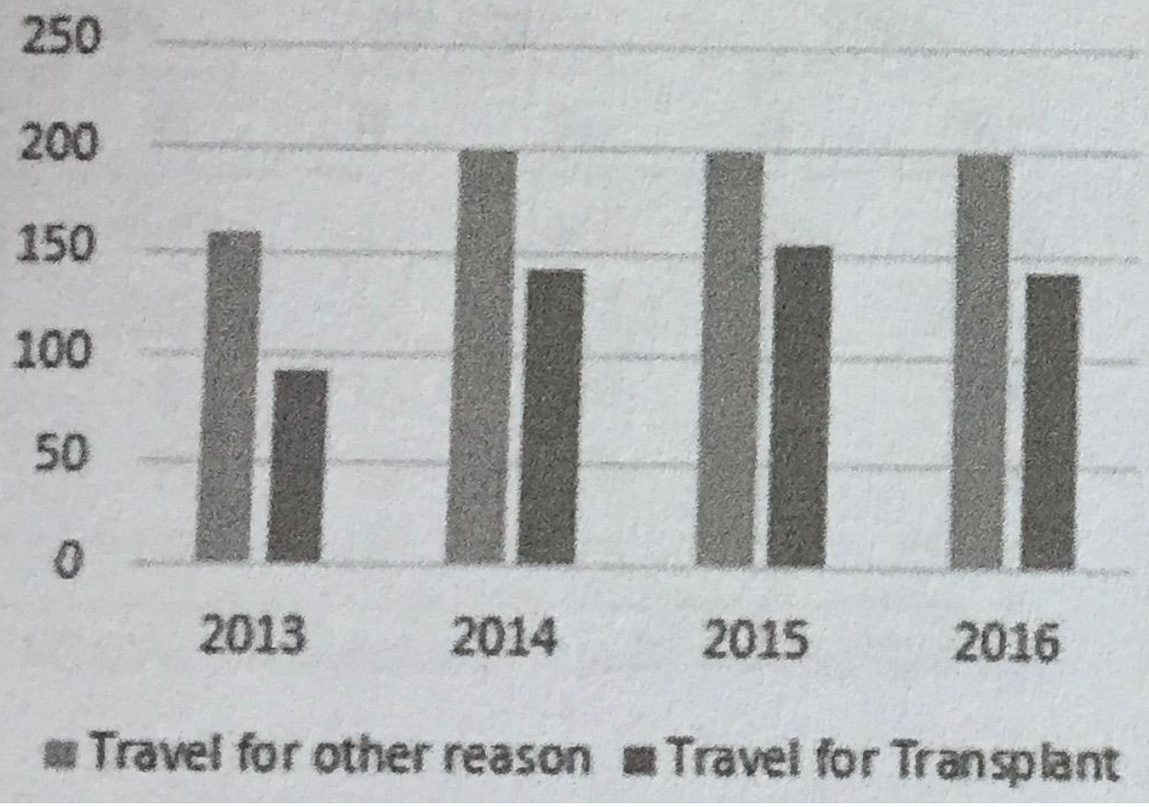
Francis L. Delmonico, MD,[1] Susan Gunderson, MHA,[1] Kishore R. Iyer, MBBS, FRCS,[1] Gabriel M. Danovitch, MD,[1] Timothy L. Pruett, MD,[1] Jorge D. Reyes, MD,[1] and Nancy L. Ascher, MD, PhD[1]



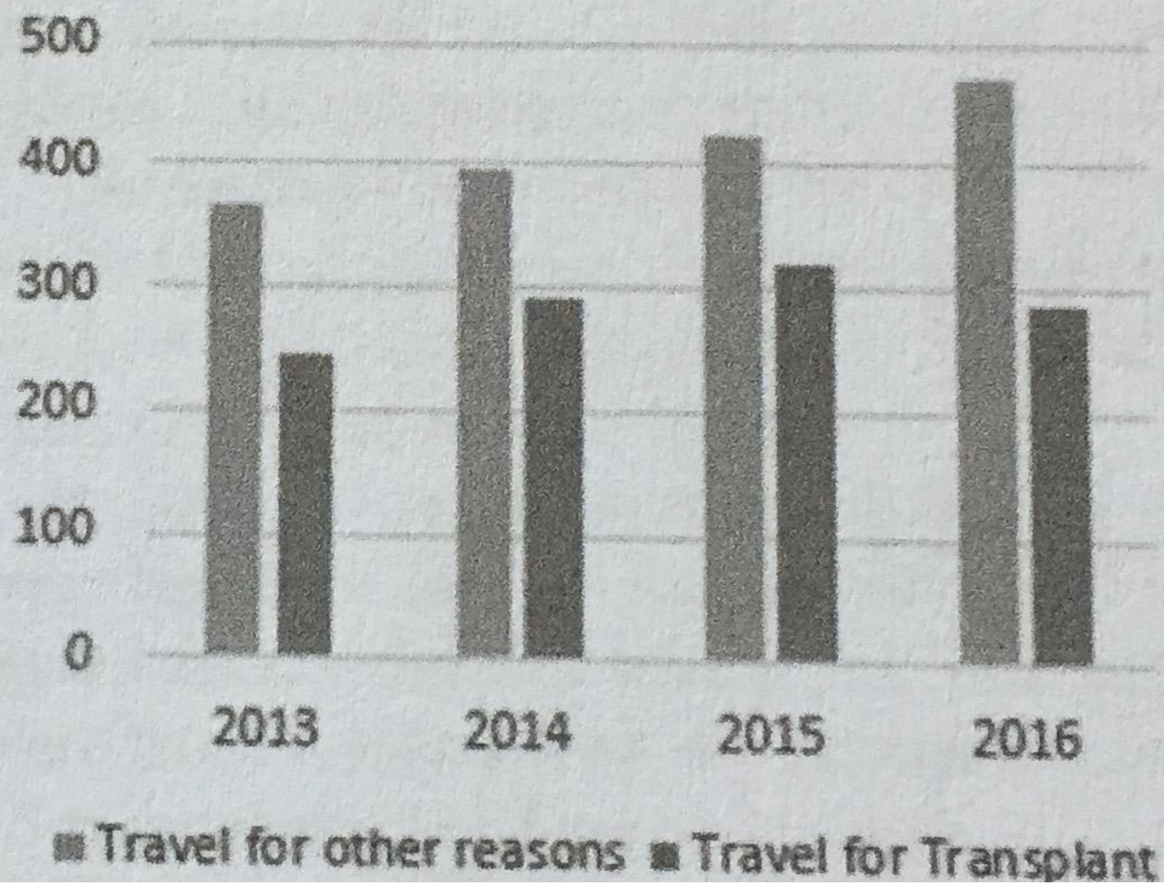
**Abstract:** Since 2012, the Organ Procurement and Transplantation Network (OPTN)/United Network for Organ Sharing (UNOS) has required transplant centers to record the citizenship residency status of patients undergoing transplantation in the United States. This policy replaced the 5% threshold of the non–US citizen/nonresidents (NC/NR) undergoing organ transplantation that could result in an audit of transplant center activity. Since April 1, 2015, the country of residence for the NC/NR on the waitlist has also been recorded. We analyzed the frequency of NC/NR deceased donor organ transplants and waitlist registrations at all US transplant centers by data provided by UNOS for that purpose to the UNOS Ad Hoc International Relations Committee. During the period of 2013 to 2016, 1176 deceased donor transplants (of all organs) were performed in non–US citizen/non–US resident (NC/NR) candidates (0.54% of the total number of transplants). We focused on high-volume NC/NR transplant centers that performed more than 5% of the deceased donor kidney or liver transplants in NC/NR or whose waitlist registrants exceeded 5% NC/NR. This report was prepared to fulfill the transparency policy of UNOS to assure a public trust in the distribution of organs. When viewed with a public awareness of deceased donor organ shortages, it suggests the need for a more comprehensive understanding of current NC/NR activity in the United States. Patterns of organ specific NC/NR registrations and transplantations at high-volume centers should prompt a review of transplant center practices to determine whether the deceased donor and center resources may be compromised for their US patients.

(*Transplantation* 2018;102: 1124–1131)

## Non Citizen/Non Resident Deceased Donor Transplants




## Non-Citizen / Non-Resident Registrations




2018

*Vielen Dank !*