YEAR BOOK®

YEAR BOOK OF TRANSPLANTATION 1993

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The Year Book of TRANSPLANTATION

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The published YEAR BOOK contains enhanced bibliographic citations for each selected article, including extended listings of multiple authors and identification of author affiliations. Each YEAR BOOK contains a Table of Contents specific to that year's volume. From year to year, the Table of Contents for a given YEAR BOOK will vary depending on developments within the field.

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Finally, each volume contains a comprehensive subject index and an index to authors of each selected paper.

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Journals Represented

Mosby subscribes to and surveys nearly 1,000 U.S. and foreign medical and allied health journals. From these journals, the Editors select the articles to be abstracted. Journals represented in this YEAR BOOK are listed below.

APMIS: Acta Pathologica et Microbiologica Scandinavica
Acta Radiologica
American Journal of Clinical Nutrition
American Journal of Clinical Pathology
American Journal of Hematology
American Journal of Kidney Diseases
American Journal of Medicine
American Journal of Obstetrics and Gynecology
American Journal of Roentgenology
Annals of Internal Medicine
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British Journal of Ophthalmology
Cancer
Cancer Nursing
Cancer Research
Chest
Clinical Genetics
Clinical Infectious Diseases
Clinical Nephrology
Diabetes
Diabetologia
European Journal of Clinical Pharmacology
European Journal of Haematology
European Journal of Nuclear Medicine
Gynecologic and Obstetric Investigation
Human Immunology
Human Reproduction
International Journal of Dermatology
Journal of Clinical Oncology
Journal of Clinical Pharmacology
Journal of Experimental Medicine
Journal of Heart and Lung Transplantation
Journal of Immunology
Journal of Infectious Diseases
Journal of Pediatric Surgery
Journal of Surgical Research
Journal of Thoracic and Cardiovascular Surgery
Journal of the American Medical Association
Journal of the American Society of Nephrology
Kidney International
Klinische Wochenschrift

Lancet
Leukemia
Mayo Clinic Proceedings
Nephrology, Dialysis, Transplantation
Nephron
New England Journal of Medicine
Oncology Nursing Forum
Ophthalmology
Oral Surgery, Oral Medicine, Oral Pathology
Pain
Pediatric Nephrology
Pediatric Pulmonology
Pediatric Research
Proceedings of the National Academy of Sciences
Reviews of Infectious Diseases
Scandinavian Journal of Immunology
Scandinavian Journal of Infectious Diseases
Scandinavian Journal of Urology and Nephrology
Schweizerische Medizinische Wochenschrift
Science
Surgery
Surgery, Gynecology and Obstetrics
Therapeutic Drug Monitoring
Thorax
Transfusion
Transplantation
Transplantation Proceedings
Wiener Klinische Wochenschrift

Standard Abbreviations

The following terms are abbreviated in this edition: acquired immunodeficiency syndrome (AIDS), the central nervous system (CNS), cerebrospinal fluid (CSF), computed tomography (CT), electrocardiography (ECG), human immunodeficiency virus (HIV), and magnetic resonance (MR) imaging (MRI).

Table of Contents

1 Kidney Transplantation

The Donor Kidney and Supply Side Problems

►↓ Some potential transplant recipients never receive an allograft; many others wait a very long time for a graft. Why? Once a potential donor is identified are there donor markers that predict delayed graft function? Which is the best preservation solution for maintaining the viability of the donated kidney? What measures can be used in the preoperative period to best ensure graft viability and long-term engraftment? Can we use living donors without harming the donor? Read on.—Terry Strom, M.D.

Factors Affecting the Waiting Time of Cadaveric Kidney Transplant Candidates in the United States
Sanfilippo FP, Vaughn WK, Peters TG, Shield CF III, Adams PL, Lorber MI, Williams GM (Duke Univ, Durham, NC; United Network for Organ Sharing, Richmond, Va; Methodist Med Ctr, Jacksonville, Fla; et al)
JAMA 267:247–252, 1992 1–1

Background.—Equitable access to donor organs is a subject of some controversy. Reports have suggested that blacks have a longer waiting period than do whites, and foreign nationals appear to have received preferential treatment at certain centers. The relative impact of factors that might account for differences in waiting time of cadaveric kidney transplant candidates was evaluated.

Methods.—Patient data were obtained from the Organ Procurement and Transplantation Network (OPTN) of the United States. All U.S. transplant centers and organ procurement organizations are required to be members of the OPTN. Multivariate analyses were used to identify associations between 36 patient, donor, and center factors, with waiting time for the 23,468 cadaveric renal transplant candidates listed between October 1, 1987, and June 30, 1990.

Results.—Immunologic factors had the greatest effect on waiting time for a cadaveric kidney. Among these factors were presensitization to HLA antigens, O or B blood type, candidacy for a repeat transplantation, and expression of rare HLA-A or HLA-B antigen phenotypes. Waiting times were significantly shorter for younger patients and those listed at multiple centers. Mean waiting times were 11.9 months for whites and 15.4 months for blacks. Patients whose local center had a small number of transplantation candidates and those who lived in areas with a high kidney organ recovery rate had shorter waiting times.

Conclusion.—Immunologic factors are the most important in determining the waiting time for a cadaveric kidney, although other variables result in a longer wait for blacks. Increased organ donation from blacks should help to shorten this time. Further, the OPTN should consider whether it is fair for patients who can afford it to be listed at multiple centers. This practice discriminates against socioeconomically disadvantaged recipients.

▶ It is impossible to make wise policy decisions without data. It is well known that presensitization to HLA and blood group phenotype can have a major impact on the waiting time for patients to receive a cadaveric renal transplant. Indeed, this analysis confirmed that recipient blood group 0 and greater than 80% panel reactive antibody (PRA) levels had the greatest adverse effect on the waiting time. What are other factors that are important in delaying a transplant? In rank order, they are blood group B, moderate PRA, low local organ recovery rates, and previous transplantation.

What factors are associated with short waiting times? Patients listed at multiple centers, low local patient:donor ratios, recipients younger than 15 years of age, and a high rate of local imported:exported kidneys are such factors. Black candidates had a longer waiting time than did whites; however, this discrepancy appears to arise from technical factors and not prejudice. When compared with white candidates, African-American candidates were far less likely to be available for transplant when a graft became available because of illness, refusal to undergo a transplant, or inability to locate the candidate. These factors are superimposed on the differences in the distribution of HLA and ABO antigens between African-Americans and whites that put blacks (who represent a high percentage of candidates, whereas whites constitute a high percentage of donors) at a disadvantage to receive a graft promptly. Nonetheless, the racial difference in waiting time is modest (15.4 months for blacks vs. 11.9 months for whites).—T. Strom, M.D.

Effect of Preservation Solution on Results of Cadaveric Kidney Transplantation

Ploeg RJ, for The European Multicentre Study Group (Univ Hosp Leiden, The Netherlands)

Lancet 340:129–137, 1992 1–2

Objective.—The University of Wisconsin (UW) organ transplant preservation solution reportedly allows successful transfer of canine pancreas, kidney, and liver after relatively long cold ischemia times. Its effects on renal graft survival were examined in a randomized multicenter trial comparing UW solution with EuroCollins solution in 695 cadaver

Delayed Graft Function (DGF) and Permanent Non-Function (PNF) for Both Preservation Solution Groups

	UW (n=352)	EuroCollins (n=343)	p
DGF			
No	272	229	..
Yes	80 *(23%)*	114 *(33%)*	0·003
PNF			
No	339	321	..
Yes	13 *(3·7%)*	22 *(6·4%)*	0·14

(Courtesy of Ploeg RJ, for The European Multicentre Study Group: *Lancet* 340:129–137, 1992.)

kidney recipients. The UW solution was used in 352 cases; the EuroCollins solution was used in 343.

Results.—Both delayed graft function necessitating dialysis and a permanent lack of function were more frequent in the EuroCollins group (table). Delayed graft function remained less frequent in the UW group after adjusting for factors known to influence the onset of graft function. Donor factors predicting delayed graft function included older age, intracerebral bleeding, and oliguria. More than 90% of patients in both groups were alive after 1 year. The 1-year graft survival in the UW group was 6% higher than in the EuroCollins group. Renal function, as reflected by the serum creatinine, was better in UW-preserved kidneys.

Conclusion.—The use of UW preservation solution rather than EuroCollins solution correlates with better renal graft function and increased graft survival.

▶ The utility of the 2 most widely used organ preservation solutions (UW and EuroCollins) was analyzed in a randomized, prospective trial conducted by 54 transplant centers belonging to the Eurotransplant organ-sharing system. The incidence of delayed graft function was 10% lower in grafts preserved with UW solution than in grafts preserved with EuroCollins (33% vs. 23%), and the incidence of permanent nonfunction was also lower in the UW group (table). Overall graft survival and renal function were better in the UW group than in the EuroCollins group. Transplants manifesting delayed graft function had a reduced rate of engraftment (about 15%) at 1 year. In grafts that functioned promptly, 92% of transplants in the UW group and 87% of transplants in the EuroCollins group were functioning at 1 year.—T. Strom, M.D.

Intraoperative Albumin Administration Affects the Outcome of Cadaver Renal Transplantation

Dawidson IJA, Sandor ZF, Coorpender L, Palmer B, Peters P, Lu C, Sagalowsky A, Risser R, Willms C (Univ of Texas Southwestern Med Ctr, Dallas)
Transplantation 53:774–782, 1992 1–3

Objective.—Because the prognostic importance of early malfunction or delayed function of a cadaver kidney graft remains uncertain, intraop-

Summary Descriptive Statistics for Patients

	IF (n = 332)	DF (n = 106)	*P*	Test
Age (years)	37.8±11.4	39.6±11.3	0.169	*t* test
Race (W/B/L %)	38/35/23	43/36/21		
OR time (min)	234±51	252±54	0.002	*t* test
Electrolyte solutions (ml/kg)	57±23	55±18	0.26	*t* test
Albumin (g/kg)	0.84±0.52	0.59±0.52	<0.0001	*t* test
Mannitol (g)	22.9	21±12	0.48	*t* test
Furosemide (mg)	96±68	87±69	0.27	*t* test
Blood loss (ml)	451±356	577±409	0.0025	*t* test
Blood transfusion (U)	1.2±1.3	1.5±1.4	0.0247	*t* test
Hospital stay (days)	16.1±10.3	26.2±16.1	<0.0001	*t* test
WIT (min)	0.9±2.5	1.5±3.1	0.0594	*t* test
CIT (hr)	22.7±7.5	26.5±8.1	0.0001	*t* test
UO <30 min (%)	67.8	12.3	0.001	Chi-square test
UO 0.5–12 hr (%)	30.7	9.4	<0.001	Chi-square test
UO >12 hr (%)	1.5	78.3	0.001	Chi-square test
Graft survival (%)				
1 month	94.6	68.9	<0.001	Fisher's test
3 months	85.6	59.2	<0.001	Fisher's test
6 months	79.4	53.1	<0.001	Fisher's test
12 months	74.3	48.9	<0.001	Fisher's test
Patient survival (%)				
1 month	98.8	97.7	0.19	Fisher's test
3 months	97.2	92.3	0.041	Fisher's test
6 months	95.0	87.3	0.032	Fisher's test
12 months	93.2	87.3	0.12	Fisher's test

Note: Patient demographic data, intraoperative drug/fluid management, time delay of urine production onset (UO), warm (WIT) and cold (CIT) ischemia times, time of urine output onset, graft survival, and patient survival associated with immediate function (IF), and delayed function (mean ± standard deviation).

(Courtesy of Dawidson IJA, Sandor ZF, Coorpender L, et al: *Transplantation* 53:774–782, 1992.)

erative factors were analyzed in a series of 438 cadaver kidney recipients. The patients, all adults, underwent transplantation in 1982–1990. Delayed function was defined as a need for hemodialysis in the first week after transplantation.

Findings.—The frequency of delayed function declined from 46% in 1982 to 15% in 1990. It correlated with a 25% lower 1-year graft survival rate and a 3-month mortality of 10%, compared with 3% when the graft functioned immediately. Significant factors affecting the outcome included the cold ischemia time, intraoperative albumin administration, the duration of surgery, and recipient age (table). A high dose of albumin (1.2 to 1.6 g/kg) led to more rapid urine output and a larger urine volume as well as a lower serum creatinine level 1 week postoperatively. Graft survival at 1 year improved from 59% to 78% with a higher dose of albumin.

Conclusion.—Infusion of albumin during cadaver kidney transplantation substantially improves the outcome.

▶ Cadaver kidney graft recipients who sustain a period of primary graft function have a much poorer rate for successful engraftment than do patients with adequate immediate function. In this large retrospective analysis, several of the usual suspects were linked to delayed graft function: a protracted period of cold ischemia and a longer duration of surgery. However, the failure to load the recipient with albumin intraoperatively proved more detrimental to achieving immediate function than did any factor except prolonged cold ischemia. Delayed graft function was associated with a significant increase in graft failure and patient mortality (table). The beneficial effect of albumin infusion on early graft function is dose dependent. High doses of albumin are more beneficial than are low doses. Albumin loading, like calcium blocker treatment, may serve to protect the integrity of the graft, and it may well make the organ more likely to withstand and recover from immune-mediated injury should this insult arise.—T. Strom, M.D.

The Relationship Between Cadaver Donor Interleukin 6 Levels and Delayed Graft Function in Kidney Transplantation

Ludwin D, Sandler S, Russell JD, Churchill DN, Gauldie J (McMaster Univ, Hamilton, Ont)

Transplantation 53:222–223, 1992 1–4

Objective.—The ischemically damaged kidney may be vulnerable to inflammatory reaction. Interleukin-6 (IL-6) is one of the mediators implicated in renal injury. The relationship between delayed graft function (DGF) and IL-6 levels in cadaver kidney donors was examined. Data were obtained from 27 consecutive cadaver kidney donors at a single center and from the 52 recipients.