

Supplementary Table S1. One-center studies showing similar outcomes using expanded criteria deceased donors (ECD) and non-ECD kidneys.

Author (Reference)	Year published	Country, period,	Number and Demographics		Clinical outcomes and survival			
			ECD	Non ECD	Graft Function		Patient and Graft Survival	
					ECD	Non ECD	ECD	Non ECD
European studies								
Fraser [43]	2010	UK 1995-2005	234	819	1y SCr 2,16mg/dl DGF 37.6%	1y SCr 1,58mg/dl (p<0,001) DGF 21.7% (<0,001)	1,3,5y DCGS 82.3,82.4,79.1%	1,3,5 DCGS 89.6,86,80.5% No differences even in <60 y
Olaverri [44]	2011	Spain 2005-2010	234	?	-		3y PS 84.8% 3y DCGS 88.6%	3y PS 97.5% 3y DCGS 89.1%
Blanca [45]	2012	Spain 1999-2006	180	180	-		Patient´s mortality was not determined by donor age	
La Manna [46]	2013	Italy 2001-2006	134	251	1y SCr 1.9mg/dl	1y SCr 1.5mg/dl	Similar PS and GS (3y)	
Lionaki [47]	2014	Greece 2005-2011	142	192	1y eGFR 49,9ml/min	1y eGFR 64,6 ml/min	5y PS 93.8% 5y DCGS 96.8%	5y PS 96.5% 5y DCGS 94.4%
Brazilian studies								
Keitel [48]	2004	Brazil 1988-2003	434	148	-		1,5y PS 87,81% 1,5y GS 74,57%	1,5y PS 92,79%; 1,5y GS 82,59%
Klein [49]	2013	Brazil 1998-2008	137 without ARF	896 without ARF	eGFR 40.1 ml/min	eGFR 53.6ml/min	1y PS 89.1% 1y DCGS 87,4%	1y PS 93.3% 1y DCGS 89,7%

SCr: serum creatinine. DGF: delayed graft function. DCGS: death censored graft survival. PS: patient survival. GS: graft survival. eGFR: estimated glomerular filtration rate. ARF: acute renal failure.

Supplementary Table S2. One center studies showing worse outcomes in kidney transplantation using kidneys from advanced age (AA) (over 60 years old) or expanded criteria donors (ECD) than using standard donors.

First author (Reference)	Year published	Country, period	Number and Demographics		Clinical outcomes and survival			
			ECD/AA	Non ECD	Graft Function		Survival	
					ECD/AA	Non-ECD	ECD/AA	Non-ECD
One-center studies								
Foley [50]	2005	USA 1990- 2005	1244 (251 in recipients ≥60y)		-	-	1,5,10,15y PS in patients ≥60 y was 90, 66, 46, 32%; higher mortality if donor ≥60y 1,5,10,15y GS in patients ≥60 y was 91,80,67,54%; more graft loss if donor ≥60y	
Verran [51]	2001	Australia 1990-1997	209	-	7.6% primary non function	-	15% death with function (5y)	-
Persson [52]	2001	Sweden	477: >70y (n=33), 60-69 y with hypertension, DM or CV disease (n=92) or <60 with ≥2 factors (n=352)		-	-	1y GS was 75, 85 and 85%, 5y GS was 46, 72 and 77% ,respectively	-
Berardinelli [53]	2001	Italy 1983-2001	110 (donors >60y)	976 (donors 11- 49y)	Primary non- function 4%; 1y SCr 2.5 mg/dl	Primary non- function 0.8%; 1y SCr 2 mg/dl	3,10y PS 95,77% 3,10y GS 77,51%	3,10y PS 96,89% 3,10y GS 84,66%
Loven [54]	2003	Sweden 1994-2001	534		Donor age <50y vs 50-64y vs >64y in eGFR: 52, 37 and 29 ml/min		Slightly better GS with younger donors (but NS)	
Fabrizii [55]	2004	Austria 1990-2000	Recipients 50-59y (n=335), 60-64 (n=141), ≥65y (n=151)	-	-	-	Donor age (2% per year increase in both parameters) associated with mortality and graft loss	-
Cacho [56]	2005	Spain 1995-2001	147 (old for old, ≥60y, >1y follow-up, CCr>75 ml/min, GL<20%)	-	-	-	1,3,5y GS 87,78,70% Graft loss associated with donor >70y (OR 1.5) and mortality with recipient >70y (OR 2.3)	-

Foss [57]	2005	Norway 1989-2002	252 (donors >60y)	-	-	-	1,5 y GS similar in recipients > and < 60 y receiving a kidney > 60 y	-
Vegso [58]	2005	Hungary 1994-2002	126 (donors >60y); 59 in 1994-1998, 30 in 1999-2000, 37 in 2001-2002	-	-	-	1y GS improved from period 1-3 (71.2,91,92%) 1y PS improved from period 1-3 (88.2,96.6,97.2%)	-
Messa [59]	2006	Italy 1986-2004	198 (donor >60y)	1078	-	-	5y PS 93% 5y DCGS 89%	5y PS 96% 5y DCGS 96%
Collini [60]	2006	Italy 2000-2005	125	113	-	-	1,3y PS 88.5,85.5% 1,3y GS 88,81.5% 1y DCGS 90.6%	1,3y PS 98,94.4% 1,3y GS 78,71% 1y DCGS 100%
Diet[61]	2010	France 1998-2004	656	1465	AR 16% DGF 39.5%	AR 17% DGF 19.3%	1,2,5y DCGS 92.9,91,82.9%	1,2,5y DCGS 94.7, 93.1, 86.7% (not different if recipient >60y or high immunological risk)
Praehauser [62]	2013	Switzerland 1999-2010	112	153	3y eCCr 37 ml/min	3y eCCr 58 ml/min	1,3,5y PS 90,83,67% ECD HR 2.31 for graft failure	1,3,5y PS 96,90,87% (p=0.001)
Barba [63]	2013	Spain 1994-2009	163	244	25% DGF	15% DGF	29% graft loss and 10% of mortality (6y)	18% graft loss and 7% of mortality (6y)

PS: patient survival. GS: graft survival. DM: diabetes mellitus. CV: cardiovascular. SCr: serum creatinine. eGFR: estimated glomerular filtration rate. NS: not significant. CCr: creatinine clearance. GL: graft loss. OR: odds ratio. DCGS: death censored graft survival. AR: Acute rejection. DGF: delayed graft function. HR: hazard ratio.

Supplementary Table S3. Multicenter studies showing worse outcomes in kidney transplantation using kidneys from advanced age donors than using standard donors.

First author (Reference)	Year	Country period	Number and definitions		Clinical outcomes and survival		
			ECD	Non-ECD	Survival		Comments
					ECD	Non-ECD	
US and Canada Studies (n=12)							
Ciciarelli [64]	1999	USA (UNO 1991-1999	58920		1y GS if donor and recipient 61-70y: 76%	1y GS if donor 21-30y and recipient 41-50y: 90%	5y GS decreases with donor age: 48% 61-65, 42% 66-70, 40% >70
Port [65]	2002	USA (UNO 1995-2000	4302	24766	All the subgroups with RR>1.7 for graft loss: they were 14.8% of all DDKT	Reference: RR=1 for donors 10-39 y, SCr <1.5 a nonstroke	The original study for ECD definition
Gjertson [66]	2002	USA (UNO 1987-2002	9126		1y GS 76.7%; 5y GS (for 1y functioning kidneys) 63%	1y GS 89% 5y GS (for 1 y functioning kidneys) 83%	All <i>retransplantations</i>
Mandal [67]	2003	USA (UNO 1995-1998	1994 (donors ≥60y); 684 c them for patients >60y	20331	RR for graft loss, death-censored graft loss and death is 1.12, 1.13 and 1.11 per 10y increment in donor age for recipients 18-59 y and 1.10, 1.16 and 1.08 for older recipients		-
Johnston [68]	2004	USA (UNO 1997-2002	1312	8451	8.4% primary nonfunction	4% primary non-function	-
Gjertson [69]	2004	USA (UNO 1996-2003	10384	47956	1y GS 83.3%	1y GS 90.6%	Donor age was the most significant variable in 1 y GS and especially in 5 y GS in those 1 y survivors
Schold [70]	2005	USA (UNO 1996-2002	45850 (a risk <i>index</i> for graft loss, Grades I to V, developed)		HR for death was related to donor grade (III 1.37, IV 1.83, V 2.14); HR for death censored graft loss also related (II 1.32, III 1.87, IV 2.93, V 4.19) 5y GS was 76.7, 73.6, 66.3, 54.8, 47.6% respectively grades I to V		14% of ECDs were grade III, 9.7% of non-ECDs V.
Chavalitdhamrong [71]	2008	US (UNOS 2000-2005	601 KT from donors ≥70y	8979 KT from donors <69y	Similar DGF rate (60.4 vs 63.9%, NS) and SCr (12m) 2.1 vs 1.9 mg/dl (p=0.022) Adjusted HR for PS 1.37 compared to 50-69y and 1.21 compared to 60-69y Adjusted HR for DCGS 1.31 compared to 50-59y and 1.18 (p=0.106) compared to 60-69y		Recipients 41-60y worse for PS, GS and DCGS with donors > 70y Recipients >60y DCGS similar
Moers [72]	2009	US (OPTN)	99860 KT recipients (1011 from donors ≥65y)		10y GS 39% (≥65y)	10y GS 70% (11-34y)	Donor age//ECD status

		1994-2006					Risk DGF HR 1,02//0, (p=0,6) Risk PNF HR1,01//1,3 Risk Graft failure HR 1,01//1,21 Death with functioning graft 1,00//1,06
Carrier [73]	2012	Canada 2003-2009	456	919	5y PS 89% 5y GS 81%	5y PS 91% (p=0.47) 5y GS 84% (p=0.28)	Donor age HR 1.018 graft loss If donor >65y 5y GS 7 vs 84% (p=0.014)
Schnitzler [74]	2012	US (USRDR) 1995-2003	5343	49551	1y eGFR 54.9ml/min 1y AR 13.2%	1y eGFR 37.8ml/min 1y AR 16.2%	If 1y eGFR 20 ml/min- >risk for DCGS 8.9 SC and 5.9 ECD
Hernandez [75]	2014	US (UNOS) 1995-2010	135311 KT recipients; 26641 60-69y, 5372 70-79y and 1766 >79y		No benefit of medium-quality (KDPI 51st-60th) or GS in older recipients compared to low-quality	No increase in RR of DCGS with low-quality kidneys between older recipients (70-79y), HR 1.11, p=0.01; >79 y, HR 1.08 p=0.58 No increase in RR of PS with low-quality kidneys (st-80th percentile) between older recipients (70-79y), HR 1.03, p=0.51; >79y, HR 1.08 p=0.31 Low-quality kidneys (81-100th percentile) had a negative impact on PS, GS in all recipients	Kidneys were classified into five quintiles of quality regarding its K Graft and recipient survival decreases with decreasing organ quality in recipients aged 50 to 59 years
European reports (n=5)							
Morris [76]	1999	UK (23 units) 1986-1993 (CsA)	6363		If donor ≥60y, 5 y GS 44% and RR for graft loss 2.15 (1 if donor 18-29y)	If donor 18-39y, 5 y GS 68%	-
Pessione [77]	2003	French Registry 1996-2000	544 (donors ≥60y)	6665 (donors <60y)	1,2,3y GS 88.2,85, 80.7%	1,2,3y GS 91.4, 88.9,86%	-
Miranda [78]	2003	Spain 1990-2001	4008		1y GS if donor age 60-69y or >69y is 84 and 80% 5y GS is 57, 50% respectively	1,5y GS (donor age 40-49 y) 89,76%	-
Oppenheimer [79]	2004	Spain 1990-1998	478 (donor >60y)	2887 (donor <60y)	1y SCr 2 mg/dl;1y proteinuria 0.4 g/day RR for graft loss:2.07 (donor 50-60y), 2.89 (61-70y), 4.13 (>70y) RR for death:2.23 (donor 50-60y), 1.95 (61-70y), 2.97 (>70y)	1y SCr 1.6 mg/dl; 1y proteinuria 0.3 g/day RR for graft loss and death =1 (donor <20y)	Only patients with 1y functioning graft were included

Aubert [80]	2015	France 2002-2011	916		7y GS 80% ECD HR 1,84 for graft loss	7y GS 88%	7y GS 44 vs 85% in patients with ECD with without DSA
Other countries (n=2)							
Collins [81]	2009	Australia and New Zealand 1991-2004	781; 241 50-59y 540 ≥60y	3248	≥60y (HR for GF 1,92 (1y) and 2,52 (5y) 1,5y PS 96,87% 1,5y GS 84,62% 1,5y DCGS 87,71%	<50y 1,5y PS 97,92% 1,5y GS 91,81% 1,5y DCGS 87,88%	Donors ≥60y more risk DGF HR 2,52, AR HR 1,67 and worse eGFR (months) 39 vs 56 ml/min compared to <50y
Lim [82]	2012	Australia and New Zealand 1995-2009	221 ≥60y recipients from donors > 60y	816 ≥60y recipients from donors < 60y	34% DGF Lower eGFR 1y and 5y	HR AR 0.46 (donor 20-40y) HR DCGF 0.37 (donor 20-40y)	No benefit in PS with younger donors in older recipients

ECD: expanded criteria donor. UNOS: United Network for Organ Sharing. GS: graft survival. RR: relative risk. DDKT: deceased donor kidney transplantation. SCr: serum creatinine. HR: hazard ratio. KT: kidney transplant. DGF: delayed graft function. NS: not significant. PS: patient survival. DCGS: death censored graft survival. PNF: primary non-function. KDPI: Kidney Donor Profile Index. AR: acute rejection. eGFR: estimated glomerular filtration rate. GF: graft failure.

Supplementary Table S4. Main studies assessing the influence of age in patient selection for kidney transplantation using expanded criteria donors.

First author (Reference)	Year published	Country, period	Recipient Age		Survival	
			Old	Young	Old	Young
One center studies (n=9)						
Humar [113]	2003	US 1990-2002	≥65y (n=150)	2,596	1,5y PS 86,73%; 1,5y GS 82,68%; 1,5y DCGS 93,87%	1,5y PS 95,87%; 1,5y GS 90,79%; 1,5y DCGS 94,87%
Fabrizii [114]	2004	Austria 1990-2000	60-64 (n=141), ≥65y (n=151)	50-59y (n=335)	5y PS and 5y GS were similar in the 3 groups in multivariate analysis	
Cacho [115]	2005	Spain 1995-2001	≥60y (n=147)	-	1,3,5y GS 87,78,70% Mortality in recipients >70y (OR 2.3)	-
Foss [116]	2005	Norway 1989-2002	>60y (n=149)	<60y (n=1,187)	1,5y GS is similar in recipients > and < 60y receiving a kidney from a donor >60y	
Foley [117]	2005	US 1990-2005	≥60y (n=251)	<60y (n=993)	1,5,10,15y PS in patients ≥60y 90,66,46, 2%; GS 91,80,67,54%	-
Heldal [118]	2009	Norway 1990-2005	≥70y (n=354)	45-54y (n=563)	Donor ≥60y: HR 1.52 for mortality and HR 2.42 for DCGS	Donor ≥60y: HR 1.82 for mortality and 1.86 for DCGS
Solá [119]	2010	Spain 1993-1996	≤60y (donor >60y) n=91	91 ≤60y (donor <60y)	1,5,10y PS 97.6%,87.2%, and 76.6% vs. 98.8%,87.5%, and 69.5% (NS) 1,5,10y GS 92.9%,81.3%, and 64.2% vs. 93.9%,76.4%, and 69.5% (NS) 1,5,10y DCGS 94.4%,92.6%, and 77.4% vs. 94.3%,86.7%, and 84.4% (NS)	
Mezrich [15]	2012	US 2000-2005	≥60y (n=189, 96 received ECD KT and 93 SCD KT)	40-59y (n=370, 105 received ECD KT and 265 SCD KT)	1,3,5y PS 95,79,76% (SCD) and 77,69,61% (ECD) p=0.01 1,3,5y GS 92,72,69% (SCD) and 72,59,54% (ECD) p=0.008 Multivariate analysis, ECD HR 1.9 (PS) and 1.97 (GS)	1,3,5y PS 95,89,79% (SCD) and 92,83,77% (ECD) p=0.25 1,3,5y GS 91,83,70% (SCD) and 88,73,56% (ECD) p=0.10 Multivariate analysis, ECD NS PS/GS
Al-Shraideh [17]	2014	US 2001-2012	≥70y (n=104, 66% ECD=68) 60-69y (n=286, 49% ECD=140)	40-59y (n=494), 30% ECD	5y PS, GS and DCGS 72, 58.5 and 73% Similar DGF and renal function	5y PS, GS and DCGS 81 (p=0.002), 66 (p=0.03) and 76% (NS)
Multicenter/Registry reports (n=10)						
Smits [32]	2002	Eurotransplant 1999	>65y ESP (n=209) vs usual allocation (n=87)	-	1y mortality rate, 12%; 1y DCGS 86 vs 79%	-
Nyberg [120]	2003	US (UNOS) 1994-1999	34,324		6y GS in recipients ≥60y 81.5% if score<20 and 69.5% if ≥20	6y GS in recipients <60 y 80.2% if score<20 and 68.8% if ≥20

Cohen [121]	2005	Eurotransplant 1994-2003	ESP (>65y, n= 876) vs usual allocation procedure (n=345)	-	1y GS and 1y DCGS were 64 and 70% with ESP and 67 and 71% in usual allocation procedure	
Meier-Kriesche [122]	2005	US (UNOS) 1990-2002	74,998		GS from young donors exceeded PS of recipients >60y; 27,500 graft years were lost in the period by allocating young kidneys to older recipients	
Shah [123]	2008	US (OPTN) 1999-2007	>50y 10,362 ECD and 26,650 SCD	-	Group 66-70 (n=2,288) SCD vs ECD 3y GS 77.4 vs 67.4% 3y DCGS 90.9 vs 82.8% 3y PS 82.3 vs 75.8%	
Frei [35]	2008	ESP 1999-2004	1,406 ESP (donor ≥65y to recipient ≥65y) 1,687 recipients between 60-64y who received donor at "any" age (O/A)	446 donor ≥65y to any recipient (A/O)	5y PS 60% (ESP), 74% (A/O) 5y GS 47% (ESP), 64% (A/O) 5y DCGS 67% (ESP), 81% (A/O)	5y PS 71% (O/A) 5y GS 51% (O/A) 5y DCGS 67% (O/A)
Huang [124]	2010	US (UNOS) 2000-2008	60-69 y (24,877, 4577 ECD) 70-79 y (6,103, 1605 ECD) ≥80y (199, 84 ECD)	-	Higher mortality 70-79y HR1.42 and ≥80y HR 2.42 Higher graft loss 70-79y HR1.26 and ≥80y HR 1.78 Similar DCGS 70-79y HR 1.02 (0.93–1.11) ≥80y HR 0.89 (0.57–1.39) Similar PS between ≥80y with SCD or ECD	
Molnar [125]	2012	US (SRTR) 1998-2006	65-69y (10,101, 3030 ECD) 70-74y (4,271, 1537 ECD) ≥75y (1,295, 556 ECD)	<65y 129,803	ECD HR 1.2 for mortality and 1.36 for DC graft loss only between those 65-69y compared to non-ECD	
Rose [126]	2015	US (URSD) and (ESP) 1999-200	1,520 KT recipients ≥65y from donors ≥65y in the EU and 446 in the US		ESP PS>GS and US GS>PS (9,6 months exceeds GS over P 49% at 5y) RR 0,74 for graft loss and 0,54 for death with functioning graft (B vs US)	ECD do not provide a lifetime of allograft function in recipients <50y
Ma [127]	2016	ANZADATA 199	≥60y ECD n=222; SCD n=239	<60y ECD n=659, SCD n=2411	5y PS 81.9% (with ECD) ECD HR 1.11 for patient mortality (NS)	5y PS 87.4% (with ECD) ECD HR 1.55 for mortality

PS: patient survival. GS: graft survival. DCGS: death censored graft survival. OR: odds ratio. HR: hazard ratio. ECD: expanded criteria donors. DGF: delayed graft function. NS: not significant. ESP: Eurotransplant Senior Program. UNOS: United Network for Organ Sharing. OPTN: Organ Procurement Transplant Network. SCD: Standard criteria donors. SRTR: Scientific Renal Transplant Registry. USRDS: US Renal Data System. RR: relative risk. ANZADATA: Australian and New Zealand Dialysis and Transplant.

Supplementary Table S5. Comparison between dual kidney transplantation and single transplantation using an ECD kidney.

Reference	Year	Country period	n	Selection criteria	DGF (%)	Graft Function			Survival		
						DKT	ECD	p	DKT	ECD	p
Moore [177]	2007	EEUU 2001-2006	16	UNOS criteria	13	1y: cr 1.6 mg/dl	1y: cr 1.9 mg/dl	ns	2y: GS 81% PS100%	2y: GS 94% PS 94%	ns
Bertelli [178]	2007	Bologna 2001-2006	26	>60y and Ramuzzi score	43,3	---	---		3y: GS 79% PS 94%	3y: GS 88%	ns
Gill [160]	2008	UNOS 2000-2005	625	>50y and UNOS criteria	29,3	---	---		4y: GS 58% PS 70%	4y: GS 60% PS 70%	ns
Salifu [179]	2008	NY 1996-2003	44	UNOS Rejected in other centers and 25% GS, vascular sclerosis or interstitial fibrosis	17,1	Discharge cr 2.9 mg/dl	Discharge Cr 3.2 mg/dl	ns	9y: GS 64% PS 73%	9y: GS 59% PS 73%	ns
Kayler [180]	2008	Pittsburgh 2002-2006	20	Preimplant biopsy with arteriosclerosis (>25%)	25	1y: cr 1.8 mg/dl	1y: cr 2 mg/dl	ns	1y GS100%	1y GS 79%	0,03
D'Arcy [181]	2009	Wisconsin 2001-2008	24	55y and Remuzzi score	33	1y: cr 1.3 mg/dl	1y: cr 1.5 mg/dl	0,04	3y: PS 88% GS 84%	3y: PS 93% GS 89%	ns
Snanoudj [166]	2009	Paris 2003-2007	81	>65y and GFR 30-60 ml/min	31,6	1y: MDRD 48 ml/min	1y: MDRD46 ml/min	ns	3y: GS 88% PS 89%	3y: GS 88% PS 91%	ns
Lucarelli [182]	2010	Bari 2000-2008	41	UNOS criteria and Remuzzi score	56,1	1y: cr 1.7 mg/dl	1y: cr 1.8 mg/dl	ns	1y: GS100% PS 92%	1y: GS 90% PS 93%	ns
Ekser [183]	2010	Padua 2003-2009	100	> 70y or 60-69y (cr>1,5, HTA, DM, proteinuria, CVA) +Biopsy score	30	1y: MDRD 68 ml/min 5y: MDRD 60 ml/min	1y: MDRD 49 ml/min 5y: MDRD 49 ml/min	<0,001 ns	3y: GS 91% PS 95%	3y: GS 94% PS 97%	ns
DeSerres [184]	2010	Canada 1999-2007	63	<75y refused for sECD >75y + normal GFR and GS<50%	27	1y: MDRD 58 ml/min 3y: MDRD 54 ml/min	1y: MDRD 59 ml/min 3y: MDRD 60 ml/min	ns	3y: GS 90% PS 96%	3y: GS 91% PS 96%	ns
Laftavi [185]	2011	NY 2001-2005	22	>60 (<3y) GFR<80ml/min	---	1y: MDRD 57 ml/min	---		5y: GS 93% PS:88%	5y: GS 75%	<0,05
Nardo [186]	2011	Bologna, 2001-2007	80	>55y and Remuzzi score	37,5	1m: cr 1,6 mg/dl	1m: cr 1,9 mg/dl	<0,05	5y: GS 94%	5y: GS 87%	ns
Cruzado [163]	2011	Spain 1996-2008	79 (15*)	UNOS criteria and Remuzzi score *vs uninephrectomized	72,9	1y: MDRD 54 ml/min	1y*: MDRD 33 ml/min	0.005	5y : GS 93% PS>60%	5y* : GS 70% PS>60%	<0.05 ns

Frutos [164]	2012	Spain 2007-2011	20	>65y and clinical data	30	1y: MDRD 55 ml/min	1y: MDRD 51 ml/min	ns	3y: GS 90%	3y: GS 90%	ns
Tanriover [161]	2014	UNOS 2002-2012	1160	KDPI categories	25	---	---		1y: GS 85% PS 89%	1y: GS 83% PS 88%	<0,05 ns
Rigotti [168]	2014	Padua 1999-2013	200	See table 9	31,5	1y: cr 1.3 mg/dl	----		5y: GS 86% PS 90%	5y : GS 77% PS 82%	0,06 0,04
Medina-Polo [165]	2014	Spain 1996-2004	88	>60y,15-50% GS and clinical data	----	1y: cr 1.6 mg/dl	1y: cr 1.8 mg/dl	ns	1y: GS 95% PS: 96%	1y: GS 91% PS: 94%	ns

DKT: dual kidney transplant; sEDC: simple expanded criteria donor; DGF: delayed graft function; GFR: estimated Glomerular filtration rate; cr= creatinine; CVA: cerebrovascular accident; GS= graft survival; PS= patient survival; ns: not significant

Supplementary Table S6. Immunosuppression strategies in kidney transplantation using ECDs

Author, Reference	Year	Country/ Period	CNI	Regimen	N	Donor/ Recipient Age (y)	Follow-up (mean)	Efficacy				Safety
								DGF	AR	SCr (mg/dl)	Survival	
Delayed introduction of CNI												
Andrés [204]	2009	Spain 2002-2003	CsA early initiation (24h) at 3 mg/kg/d	basiliximab + steroids + MMF	38	57.6 ± 12.5 56.4 ± 9.5	6 m	31.6%	5.3%	At 6m: cGFR 43.1±12 ml/min	PS: 92.1% GS: 89.5%	Infection comparable (81.6 vs 72.5 vs 76.9, p= 0.636). No differences in hypertension and hyperglycaemia
			CsA early initiation at 5		40	56.3 ± 10.7 55.7 ± 9.5		37.5%	15%	At 6m: cGFR 48.0±14	PS: 95% GS: 95%	
			CsA delayed (after 7–10 d) at 5		36	58.9 ± 11.3 57.7 ± 12.3		41.7%	25%	At 6m: cGFR 47.2±17	PS: 94,4% GS: 83,3%	
Andrés [205]	2009	Multicenter European/ 2004-2006	delayed TAC	delayed TAC (started on day 7)+ basiliximab + early steroid discontinuation on day 8 + MMF	132	63.2 ±13.3 66.4 ±4.0	6 m	17.4±2 8 d 30.3%	18.9%	1.69±0.6	PS: 96.1% GS: 90.0%	Infections: 65.2% CMV infection: 10.6% Malignancies: 0 Antidiabetic treatment: 8.4%
			standard TAC	standard TAC + steroids until day 91 + MMF	122	63.2 ±13.7 65.5 ±3.8		21.3±3 9 d 23.8%	18%	1.92±1.02	PS: 99.2% GS: 87.6%	Infections: 61.5% CMV infection: 6.6% Malignancies: 0.02% Antidiabetics: 16.9%
González-Roncero [206]	2012	Spain	delayed TAC (0,1 mg/kg/d initiated at 5th or 7th day after surgery)	Daclizumab + MMF + steroids	133	64.4±5.3 61.3±6.2	5 y	-	At 1y: 0% At 5y: 1.66%	At 1y: 1,6±0,5; FGe (MDRD) 46,28±15,64 At 5y: 1,61±0,60 mg/dl; FGe 45,79±15,25	At 5y: PS: 93.1% GS: 93.8% (censored for death)	Antihypertensive medication: 92.9%; treatment for dyslipidemia: 63%; post-transplant diabetes 15.7%. 14,3% neoplasia (4% >1).
CNI-free with imTOR or MMF-based therapy												
Durrbach [209]	2008	France/ 2002-2004	SRL	ATG (0-7 d) + SRL + MMF + steroids	33	62.6±10.5 (19–75) 52.6±11.2	6 m	45.4%	12.1%	6 m: 1.94±0.6	PS: 97% GS: 87.5%	Adverse effects in SRL vs CsA: CMV infection 3 vs 0%; pancytopenia (12.1 vs 0%, p=0.005), aphtous stomatitis (12.1 vs. 0%, p=0.05), epistaxis (12.1 vs. 0%, p=0.05). One neoplasia each group.
			CsA	ATG (0-7 d) + CsA + MMF + steroids	36	63.1±11.8 (19–75) 57.1±8.9		30.6%	8.3%	6 m: 1.94±0.74	PS: 100% GS: 97%	
Guba [207]	2008	Germany/ 2002-2005	free	rATG (single dose) + basiliximab + MMF (levels 2-6 µg/ml) + steroids	56	48.0 ± 14.5 59.9 ± 3.2	23.5 m	35%	BPAR 39%	At 1 y: 1.76 ± 0.78	At 1y: PS: 84% At 24m: GS: 77.2%	CMV infection 55%, tissue invasive disease 10%, recurrent episodes 35%
						71.1 ± 5.0 67.0 ± 2.4		58%	BPAR 63%	At 1 y: 2.06 ± 1.24	At 1y: PS 85% At 24m: GS 64%	
Arbogast [208]	2009	Germany/ 1997-2007	free	rATG (single dose) + basiliximab + MMF (levels 2-6 µg/ml) + steroids	30	67.8±3.8 69.4±13.3	5 y	-	33.3%	At 6m: 1.78±0.45 At 1y: 2.03±0.49	At 1y: PS: 86.7% GS: 83.3%	Infections: 23.3%, CMV infection: 23.3% Lymphoceles: 23.3%

Luke [210]	2009	UK and Canada	Free	ATG (n=11)/basiliximab (n=2) + SRL + MMF + steroids	13	55.8±3.0 55.5±5.1	23.4 ± 14 m	38.5%	26%	At 1y: 1.44	At 1y: PS: 100% GS: 92.3%	CMV infection 8%
			CNI-based	CsA/TAC + basiliximab/ATG	13	52.4±3.6 55.0±2.5	25.1 ± 14 m	38.5%	31%	At 1y: 1.66	At 1y: PS: 92.3% GS: 84.6%	CMV infection 4%
Sánchez-Escuredo [211]	2015	Spain 1999-2011	free (MMF + steroids + since 2002 EVE or SRL at 5th day after surgery)	thymoglobulin	10	68±6 65±6	1 y	30%	10%	-	At 1y: PS: 100% GS: 90%	Thymoglobulin or ATG more leukopenia (p=0.004) and thrombopenia (p=0.002) than basiliximab. No differences in infection or PTLD.
				ATG	21	74±6 69±6		4,8%	19,1%	-	At 1y: PS: 100% GS: 85.7%	
				Basiliximab	147	69±5 67±5		19,7%	17,7%	-	At 1y: PS: 96,6% GS: 90.5%	
Depending on induction strategy												
Sancho [213]	2015	Spain 2000-2011	CsA (7 mg/kg/d) or TAC (0.15 mg/kg/d), initiated 72h after KT (steroids + MMF)	rATG (maximum 2 doses 1.25 mg/kg)	162	58.4±14.1 56.7±11.9 Donor >70 years 25%	76.6 ± 37.51 months (range, 24-187)	40%	11.4%	-	No different patient or graft survivals	Higher incidence of CMV infection with basiliximab (29 vs 40%; p=0.04), No difference in neoplasia (22 vs 26%; p=0.9).
				Basiliximab	159	56.8±13.4 54.8±11.5 Donor >70 years 14%		48.8%	22.1%(p=0.01)	-		
Hardinger [214]	2009	USA/	CsA (steroids + MMF)	ATG (1.2 mg/Kg for 5 d)	40	ECD	1 y	45%	25%	-	At 1y: PS: 92.5% GS: 85%	-
					101	SCD		38.6%	11.9%	-	At 1y: PS: 93% GS: 93.1%	
				Basiliximab (2 doses 20mg)	35	ECD		51.4%	28.6%	-	At 1y: PS: 100% GS: 91.4%	
					102	SCD		41.2%	24.5%	-	At 1y: PS: 94.1% GS: 89.2%	
Favi [217]	2010	Italy/ 2007-2009	Low dose of TAC or CsA	Basiliximab + ATG + steroids	20	Old 65±4 63±5	6 m	-	0	1.9±0.3	At 6m: PS: 95% GS: 95%	No differences in CMV disease (1 patient in each group) or PTLD (0%)
					26	Young 37±15 47±14		-	7.7%	1.5±0.3	At 6m: PS: 100% GS: 96%	
Gill [212]	2011	USA (UNOS) 2003-2008	ATG	Maintenance: 94% CNI; 85% MMF; 68% steroids	7140	43.7±17.4 65.8 ±4.5	6 y	27%	7.3%	-	Values stratified depending on high/low risk donors	-
			Alemtuzumab	Maintenance: 91% CNI; 78% MMF; 30% steroids	1465	44.6±17.8 66.1±4.8		20.6%	11.4%	-		-
			IL2RA	Maintenance: 92% CNI; 85%	6215	42±17.5 66.2±4.8		22.7%	0.5%	-		-

				MMF; 89% steroids								
Patel [215]	2011	USA 2000-2005	ATG	Steroids + SRL or CNI (on day 1-2 or when creat <50% of pre- transplant value, if DGF initiated at the completion of ATG induction) + MMF	45	≥ 60 65 (61-67)	3 y	13%	2%	cGFR (MDRD) At 1y 55 ±19 At 3y 51 ±16	At 36m: PS: 80% GS: 73%	CMV infection 11% Causes of death: - Sepsis/infection 29% - Cardiovascular 29% - Malignancy 14% - Unknown 29% ATG dosage >6 mg/kg associated with death
					256	< 60 44 (36-51)		27%	16%	cGFR (MDRD) At 1y 59 ±21 At 3y 53 ±23	At 36m: PS: 94% GS: 84%	CMV infection 4% Causes of death: - Sepsis/infection 35% - Cardiovascular 18% - Malignancy 0% - Unknown 35%
Khanmoradi [216]	2013	USA 2002- 2010	CsA or TAC	rATG + MMF + steroids	137 42.3% ECD	elderly 50.6±18.3 70.8±4.5	1 y	31.1%	BPAR 13.1%	cGFR (MDRD) 1y 48.7±20 3y 46.5±23.5	At 3y: PS: 87% GS: 84%	Leukopenia more frequent in younger patients (19.9 vs 11.7%; p= .038). Similar thrombocytopenia. No difference in CMV, urinary tract infection or pneumonia. Similar malignancy (5.1 vs 2.2%, p=NS).
					276 16.7% ECD	nonelderly 40.7±16.6 52.5±9.8		50%	BPAR 16.7%	cGFR (MDRD) 1y46.5±23.43y 47.6±25	At 3y: PS: 82% GS: 84%	
BENEFIT- EXT [218- 223]	2013	Multicenter	free	more intensive belatacept	184	ECD 56.7 ±13	3 y	47%	17.9%	cGFR (MDRD) 1y: 52.1 ±21.9 At 5y: 55.9	1y PS: 96% GS: 91% 3y: PS 80%	Blood pressure at 5y in belatacept less intensive vs CsA. Cholesterol higher in CsA vs belatacept. PTLD in EBV negative belatacept patients.
			free	less intensive belatacept	175	ECD 56.1 ±12		47%	31%	1y: 49.5 ±25.4 5y: 59.0	1y: PS: 98% GS: 91% 3y: PS 82%	
			CsA	CsA	184	ECD 55.7 ±12		49%	26%	1y: 45.2 ±21.1 5y: 44.6	1y: PS: 96% GS: 89% 3y: PS 80%	

ATG: Anti-thymocyte globulin; BPAR: biopsy proved acute rejection; cGFR: calculated glomerular filtration rate; CsA: cyclosporine; DGF: delayed graft function; ECD: expanded criteria donor; EVE: everolimus; GS: graft survival; imTOR: Mammalian target of rapamycin inhibitors; IQR: interquartile range; KT: kidney transplantation; m: months; MMF: mycophenolate mophetil; MPA: mycophenolic acid; PTLD: posttransplant lymphoproliferative disease; PS: patient survival; SBP: systolic blood pressure; SCD: standar criteria donor; SRL: sirolimus; TAC: tacrolimus; USA: United States of America; y: year.