Table S1. Baseline characteristics by pretransplant DSA class

Variable	Class I (n = 34)	Class II (n = 37)	Both (n = 9)	*P*
Age at transplant, median (IQR)	45 (36–54)	51 (40–57)	48 (27–50)	0.38
Female sex, n (%)	19 (56)	24 (65)	3 (33)	0.22
Race, n (%)				0.56
White	12 (35)	16 (43)	2 (22)	
Black	15 (44)	17 (46)	6 (67)	
Other*	7 (21)	4 (11)	1 (11)	
Pretransplant diabetes	9 (26)	6 (16)	1 (11)	0.44
Highly recurrent primary disease,** n (%)	9 (26)	4 (11)	1 (11)	0.19
Pretransplant dialysis, median years (IQR)	1.1 (0–4.5)	0 (0–4.0)	4.7 (0.6–5.9)	0.24
Preemptive transplant, n (%)	16 (47)	20 (54)	2 (22)	0.23
Living donor, n (%)	6 (18)	9 (24)	2 (22)	0.79
Serum creatinine at transplant mg/dL, median (IQR)	7.3 (5.1–8.9)	5.9 (4.5–7.7)	8.1 (7.1–9.6)	0.16
Sensitization type, n (%)				0.23
Pregnancy	8 (24)	13 (35)	1 (11)	
Transfusion	9 (26)	12 (32)	3 (33)	
Prior transplant	6 (18)	9 (24)	2 (22)	
Multiple types	11 (32)	3 (8)	3 (33)	
UNOS cPRA, median (IQR)	44 (0–88)	56 (0–89)	73 (0–92)	0.80
Class I PRA, median (IQR)	22 (0–76)	0 (0–52)	23 (0–74)	0.24
Class II PRA, Median (IQR)	0 (0–49)	29 (0–81)	36 (0–75)	0.09
Degree of class I HLA (A/B) matching, n (%)				0.41
0–2 Mismatches	13 (38)	17 (46)	2 (22)	
3–4 Mismatches	21 (62)	20 (54)	7 (78)	
Degree of class II HLA (DR) Matching, n (%)				0.37
0 Mismatches	6 (18)	7 (19)	0 (0)	
1–2 Mismatches	28 (82)	30 (81)	9 (100)	
B Cell Flow, n (%)				0.02
Negative	33 (97)	34 (92)	6 (67)	
Weakly reactive	1 (3)	3 (8)	3 (33)	
T cell flow, n (%)				0.54
Negative	33 (97)	36 (97)	8 (89)	
Weakly reactive	1 (3)	1 (3)	1 (11)	

P-value of < 0.05 is considered statistically significant.
cPRA, calculated panel reactive antibody; HLA, human leukocyte antigen; IQR, interquartile range; PRA, panel reactive antibody; UNOS, United Network for Organ Sharing.
*Other: Hispanic, Asian, Native American, Pacific Islander, Multiracial.
**Highly recurrent primary disease: focal segmental glomerular sclerosis, systemic lupus erythematosus, hemolytic uremic syndrome.

Table S2. Patient-level detail of DSA characteristics and post-transplant outcomes

ID	DSA Class	Class I Specificities (MFI)	Class II Specificities (MFI)	Post-Transplant DSA >3,000 MFI	Any Rejection
1	I & II	B18 (2300) B37 (1400)	DRB3 (1800) DQ7 (1100) DRB1*10 (1000)	Class I & II	AMR
2	I & II	C16 (833) C17 (863)	DQ7 (913)	Class II	AMR & ACR
3	I & II	C7 (864)	DQ7 (1997)	Class II	ACR
4	I & II	B44 (1527)	DRB1*13 (1088) DRB1*03 (845)		ACR & AMR
5	I & II	A11 (1000)	DQ8 (2500)		
6	I & II	B51 (1400)	DRB3 (1250)		
7	I & II	B44 (1147) C4 (980)	DRB1*04 (1856)		
8	I & II	A66 (2000) A74 (1100)	DRB1*08 (2244)		ACR
9	I & II	A1 (2500)	DRB1*13 (2143) DRB3 (2200)		
10	I	B8 (1100)			
11	I	B81 (1836)			ACR
12	I	A30 (1000) A32 (2000)			
13	I	B8 (1315)			
14	I	B44 (1567)			
15	I	A32 (1321)			
16	I	A66 (1800) C2 (1000)			
17	I	A2 (1620)			
18	I	A11 (1651)			ACR
19	I	C2 (1600)			
20	I	C7 (2800)			
21	I	B44 (1213) C16 (906) C7 (1862)		Class I	
22	I	C7 (1304)			
23	I	A3 (1500) C7 (1800)			
24	I	C6 (830)			ACR
25	I	C7 (810)			
26	I	C6 (2434)			
27	I	C5 (984)			

28	I	C7 (1100)			
29	I	C4 (1782)			
30	I	B48 (842)			
31	I	A24 (1000)			
32	I	B13 (1721)			
33	I	A2 (1315)			
34	I	A23 (1718)		Class I	
35	I	C4 (1582) C7 (2392)			
36	I	A36 (1202)			
37	I	A24 (2500)			
38	I	C7 (1896) C6 (1646)			
39	I	C7 (1133)			
40	I	C12 (1339)		Class I	
41	I	A30 (2950)			
42	I	B7 (1018) B27 (1113) C15 (1341)			
43	I	A30 (1208)			
44	II		DQ4 (2141)	Class II	ACR
45	II		DRB3 (1367)		
46	II		DQ5 (1500)		
47	II		DQ6 (2133) DRB1*04 (1699) DRB4 (1502) DRB5 (1610)	Class II	
48	II		DQ9 (1900)	Class II	ACR
49	II		DRB4 (3000)		
50	II		DRB1*15 (2077)		
51	II		DRB1*13 (1000)		
52	II		DQ2 (2090)		
53	II		DRB3 (800)		
54	II		DRB1*04 (2830)		
55	II		DQ6 (800)		
56	II		DRB3 (1800)		
57	II		DQ2 (1529)		
58	II		DRB1*17 (2354)		
59	II		DQ7 (1340)		
60	II		DRB3 (3000)		
61	II		DQ6 (1960) DRB3 (900)		
62	II		DQ2 (961)	Class II	

63	II		DRB1*15 (900)		ACR
64	II		DRB3 (1721) DRB4 (1528) DRB5 (952)		
65	II		DQ7 (900)		
66	II		DRB3 (1677)		
67	II		DRB1*12 (2200) DRB3 (2974)	Class II	
68	II		DRB1*13 (1509) DRB4 (1350)		
69	II		DQ2 (1800) DRB3 (2000)		ACR
70	II		DQ9 (2000)	Class II	
71	II		DQ2 (2093)		
72	II		DQ7 (2689)		
73	II		DRB3 (1225)	Class I	AMR
74	II		DQ8 (3000)		
75	II		DQ9 (919)		
76	II		DRB1*15 (1430)		
77	II		DRB1*04 (1000)		
78	II		DQ5 (2178) DQ6 (2007) DRB1*15 (1168)		
79	II		DRB1*04 (1037)		
80	II		DRB1*13 (1087)		

ACR, acute cellular rejection; AMR, antibody-mediated rejection; DSA, donor-specific antibody; MFI, mean fluorescence intensity.

Table S3. Severity of rejection by pretransplant DSA class

Variable	Class I (n = 3)	Class II (n = 5)	Class I & II (n = 5)	*P*
Any treatment, n (%)	1 (33%)	1 (20%)	5 (100%)	0.03
Inpatient treatment, n (%)	1 (33%)	1 (20%)	5 (100%)	0.03
Hospital length of stay (days, mean)	4	3	4.6	ns
Steroids, n (%)	1 (33%)	1 (20%)	5 (100%)	0.03
Thymoglobulin, n (%)	0 (0%)	1 (20%)	5 (100%)	< 0.01
IVIG, n (%)	0 (0%)	2 (40%)	2 (40%)	0.42
Plasmapheresis, n (%)	0 (0%)	2 (40%)	4 (80%)	0.08
Rituximab, n (%)	0 (0%)	0 (0%)	1 (20%)	0.42

P-value of < 0.05 is considered statistically significant.
DSA, donor-specific antibody; IVIG, intravenous immunoglobulin.

Table S4. Patient-level detail for patients who experienced acute rejection

ID	DSA Class	Posttransplant DSA >3,000 MFI	Rejection type	Tacrolimus level (µg/L)	Prednisone dose (mg)	Mycophenolic acid dose (mg)	Preceding infection?
1	I & II	Class I & II	AMR	4.6	5 qD	500 BID	N
2	I & II	Class II	AMR & ACR	0**	0**	0**	N
3	I & II	Class II	ACR	10.4	5 qD	500 BID	N
4	I & II		ACR & AMR	5.0	5 qD	500 BID	N
8	I & II		ACR	Not prescribed***	5qD	500 BID	Herpes zoster
11	I		ACR	6.0	5 qD	360 BID*	URI symptoms
18	I		ACR	6.2	5 qD	180 BID*	N
24	I		ACR	8.8	15 qD	500 BID	N
44	II	Class II	ACR	4.2	5 qD	360 BID*	N
48	II	Class II	ACR	6.2	5 qD	500 BID	N
63	II		ACR	3.0	5 qD	360 BID*	Treated skin abscess
69	II		ACR	13.6	5 qD	180 BID*	N
73	II	Class I	AMR	7.7	7.5 qD	500 BID	N

ACR, acute cellular rejection; AMR, antibody-mediated rejection; BID, twice a day; DSA, donor-specific antibody; qD, daily; MFI, mean fluorescence intensity; URI, upper respiratory infection.
*Dose of mycophenolic acid delayed release.
**Patient had documented nonadherence to medication regimen for 2 months prior to rejection.
***Patient was treated with cyclophosphamide.

Table S5. Severity of rejection by post-transplant DSA elevation

Variable	Post-transplant DSA ≥3000 MFI (n = 6)	Post-transplant DSA <3000 MFI (n = 7)	*P*
Any treatment, n (%)	5 (83)	3 (43)	0.13
Inpatient treatment, n (%)	4 (67)	3 (43)	0.39
Hospital length of stay (days, mean)	4	3.6	ns
Steroids, n (%)	4 (67)	3 (43)	0.39
Thymoglobulin, n (%)	4 (67)	2 (29)	0.17
IVIG, n (%)	3 (50)	1 (14)	0.16
Plasmapheresis, n (%)	4 (67)	2 (29)	0.17
Rituximab, n (%)	1 (17)	0 (0)	0.26

P-value of < 0.05 is considered statistically significant.
DSA, donor-specific antibody; IVIG, intravenous immunoglobulin; MFI, mean fluorescence intensity.

Figure S1

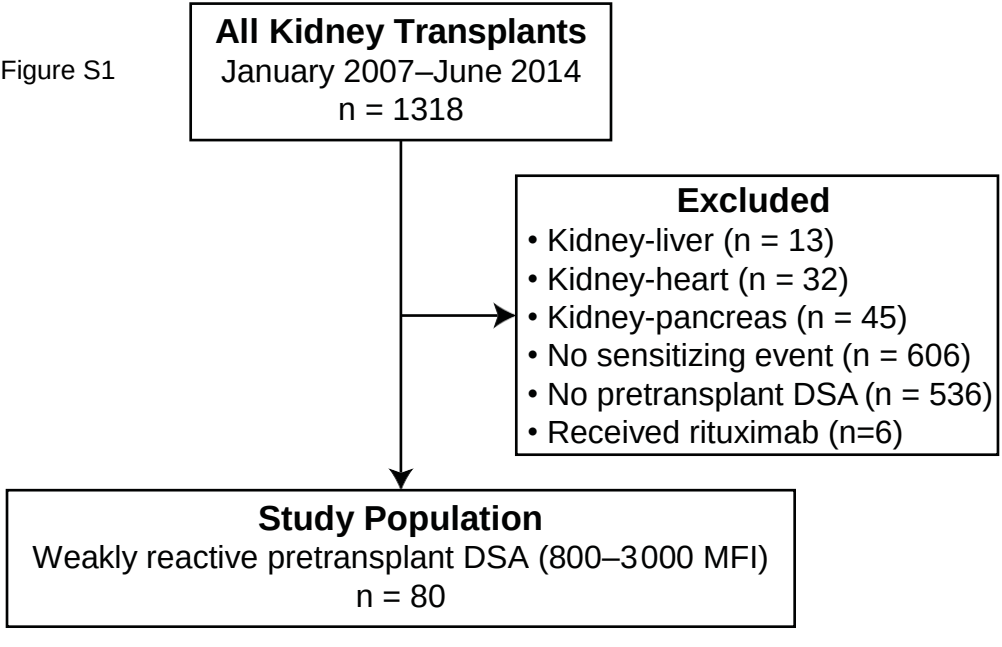
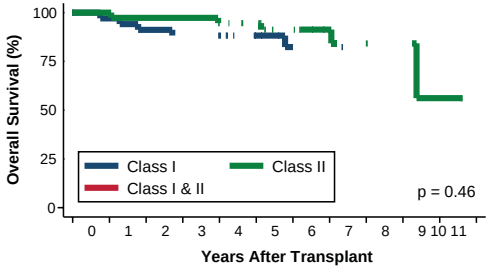

All Kidney Transplants
January 2007–June 2014
n = 1318
Excluded
• Kidney-liver (n = 13)
• Kidney-heart (n = 32)
• Kidney-pancreas (n = 45)
• No sensitizing event (n = 606)
• No pretransplant DSA (n = 536)
• Received rituximab (n=6)
Study Population
Weakly reactive pretransplant DSA (800–3000 MFI)
n = 80

Figure S1. Patient selection. Schematic of patient selection from all patients who received a kidney transplant at our institution between 2007 and 2014. DSA, donor-specific antibody.

Figure S2

A

Overall Survival by DSA Class

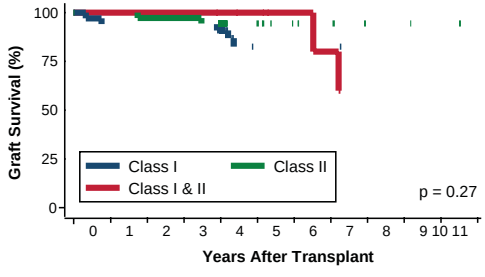


Number at Risk

Class I	34	33	31	30	29	17	12	8	3	2	1	0
Class II	37	37	36	36	35	30	20	13	8	6	2	0
Class I and II	9	9	9	9	8	7	5	4	2	0	0	0

B

Graft Survival by DSA Class

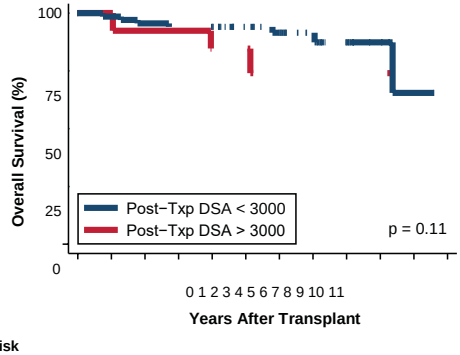


Number at Risk

Class I	34	32	30	30	27	15	11	7	2	2	1	0
Class II	37	37	35	35	33	29	18	13	7	5	2	0
Class I and II	9	9	9	9	8	7	5	4	1	0	0	0

C

Overall Survival by DSA Increase

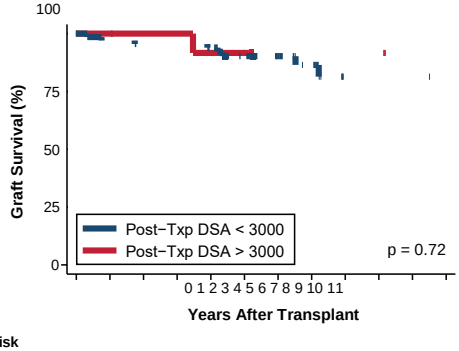


Number at Risk

Post−Txp DSA < 3000	67	66	64	63	62	45	34	22	11	6	3	0
Post−Txp DSA > 3000	13	13	12	12	10	9	3	3	2	2	0	0

D

Graft Survival by DSA Increase



Number at Risk

Post−Txp DSA < 3000	67	65	62	62	58	43	31	21	8	5	3	0
Post−Txp DSA > 3000	13	13	12	12	10	8	3	3	2	2	0	0

Figure S2. Effect of pretransplant DSA class and post-transplant DSA dynamics on patient and graft survival. A, Overall patient survival grouped by the class of pre-transplant DSA. B, Death-censored kidney allograft survival grouped by the class of pre-transplant DSA. C, Overall patient survival grouped by whether pre-transplant DSA increased to >3,000 MFI after transplant. D, Death-censored kidney allograft survival grouped whether pre-transplant DSA increased to >3,000 MFI after transplant.