

Supporting Information

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Table S1. Characteristics of 1,121 study participants

Patient Characteristics	Matched CBU	1 HLA Mismatch, NIMA		2 HLA Mismatch, NIMA	
		Match	No Match	Match	No Match
(number)	(62)	(25)	(363)	(54)	(617)
Patient Gender:					
Male	35 (56%)	13 (52%)	206 (57%)	28 (52%)	346 (56%)
Female	27 (44%)	12 (48%)	157 (43%)	26 (48%)	271 (44%)
Age (years):					
0–4	26 (42%)	7 (28%)	134 (37%)	14 (26%)	130 (21%)
5–9	14 (23%)	8 (32%)	98 (27%)	9 (17%)	130 (21%)
10–19	11 (18%)	6 (24%)	75 (21%)	13 (24%)	170 (28%)
≥20	11 (18%)	4 (16%)	56 (15%)	18 (33%)	187 (30%)
Mean	12.4	13.1	11.5	18.1	17.1
Median	6.4	8.9	6.9	13.0	11.9
Range	1 m–61 y	4 m–48 y	10 m–67 y	1 y–58 y	3 m–65 y
Ethnic Background:					
Asian	2 (3%)	2 (8%)	12 (3%)	4 (8%)	25 (4%)
African	2 (3%)	1 (4%)	37 (10%)	11 (21%)	127 (21%)
Hispanic	12 (20%)	5 (21%)	68 (19%)	14 (26%)	122 (20%)
Caucasian	43 (73%)	15 (62%)	221 (62%)	21 (40%)	301 (50%)
Other	0 (0%)	1 (4%)	16 (5%)	3 (6%)	25 (4%)
Unknown	3	1	9	1	17
Diagnosis:					
ALL	27 (44%)	8 (32%)	152 (42%)	18 (33%)	246 (40%)
AML	19 (31%)	8 (32%)	128 (35%)	22 (41%)	199 (32%)
CML	3 (6%)	1 (4%)	23 (6%)	7 (13%)	82 (13%)
Other Leukemia	6 (10%)	1 (4%)	15 (4%)	3 (6%)	25 (4%)
Lymphoma	1 (2%)	4 (16%)	17 (5%)	4 (7%)	23 (4%)
Myelodysplasia	6 (10%)	3 (12%)	28 (8%)	0 (0%)	42 (7%)
Stage of ALL, AML, CML: (12 not advanced, but not known if early or intermediate):					
Early	15 (33%)	8 (50%)	78 (28%)	11 (25%)	129 (26%)
Intermediate	25 (54%)	5 (31%)	132 (47%)	13 (30%)	228 (46%)
Advanced	6 (13%)	3 (19%)	73 (26%)	20 (45%)	140 (28%)
Unknown	1	1	6	1	3
Prior Transplant:					
Allogeneic	0 (0%)	1 (4%)	10 (3%)	2 (4%)	22 (4%)
Autologous	5 (9%)	1 (4%)	16 (5%)	2 (4%)	42 (7%)
None	49 (91%)	22 (92%)	306 (92%)	46 (92%)	504 (89%)
Unknown	8	1	31	1	49
Conditioning Regimen:					
TBI + Cyph	6 (13%)	3 (14%)	73 (23%)	8 (17%)	133 (25%)
TBI + Other	18 (38%)	11 (50%)	115 (37%)	19 (40%)	216 (40%)
Bu + Cyph	11 (23%)	3 (14%)	54 (17%)	6 (12%)	77 (14%)
Other Myeloabl.	10 (21%)	3 (14%)	62 (20%)	12 (25%)	84 (16%)
Non-Myeloabl.	2 (4%)	2 (9%)	7 (2%)	3 (6%)	26 (5%)
Unknown	15	3	52	6	81
GvHD Prophylaxis:					
CSA, no MTX	33 (69%)	17 (94%)	216 (78%)	34 (79%)	355 (73%)
MTX, no CSA	6 (12%)	0 (0%)	13 (5%)	2 (5%)	18 (4%)
CSA + MTX	7 (15%)	1 (6%)	38 (14%)	5 (12%)	74 (15%)
Tacrolimus	2 (4%)	0 (0%)	9 (3%)	1 (2%)	34 (7%)
Other/None	0 (0%)	0 (0%)	2 (1%)	1 (2%)	6 (1%)
Unknown	14	7	85	11	130
Center Experience with NYBC CBUs:					
Non-U.S.	14 (23%)	4 (16%)	97 (27%)	14 (26%)	132 (25%)
U.S. <50 CBUs	30 (48%)	13 (52%)	177 (49%)	26 (48%)	242 (39%)
U.S. ≥50 CBUs	18 (29%)	8 (32%)	89 (25%)	14 (26%)	223 (36%)
Year of Transplant:					
1993–1996	13 (21%)	6 (24%)	62 (17%)	5 (9%)	90 (15%)
1997–1999	15 (24%)	8 (32%)	132 (36%)	24 (44%)	211 (34%)
2000–2002	9 (15%)	4 (16%)	64 (18%)	13 (24%)	147 (24%)
2003–2006	25 (40%)	7 (28%)	105 (29%)	12 (22%)	169 (27%)
Total Nucleated Cell (TNC) Dose (x 10⁷/kg):					
0.7–2.4	15 (19%)	5 (20%)	73 (20%)	14 (26%)	151 (24%)
2.5–4.9	21 (29%)	12 (48%)	137 (38%)	23 (43%)	252 (41%)
5.0–9.9	18 (31%)	5 (20%)	93 (26%)	14 (26%)	155 (25%)
≥10.0	8 (22%)	3 (12%)	60 (17%)	3 (6%)	59 (10%)
Mean*	4.3	4.2	4.7	3.8	4.1
Median	3.9	4.4	4.5	3.5	3.7
Range	0.7–19.4	1.2–19.6	0.7–23.1	1.3–15.9	0.9–28.0

*Geometric Mean based on log transformed TNC dose.

Table S3. Multivariate analyses of transplantation outcome end points, relative risks, 95% confidence intervals and P values

End point: Variable	Number	RR* (95% CI)	P value
Absolute Neutrophil Count (ANC) \geq 500/mm³ by Day 77: (time unknown on 61 patients)			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	59	1.7 (1.2–2.3)	0.001
1–2 HLA Mismatch, NIMA Match	73	1.3 (1.01–1.7)	0.043
1–2 HLA Mismatch, no NIMA Match	928	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	366	Reference	
2 HLA Mismatch	635	1.0 (0.9–1.2)	0.977
TNC Dose/kg (natural log):	1060	1.5 (1.4–1.7)	<0.001
<u>Prior Transplant:</u>			
None	903	Reference	
Allogeneic	35	0.8 (0.5–1.2)	0.300
Autologous	64	1.4 (1.1–1.9)	0.012
Unknown	58	0.5 (0.4–0.8)	0.001
<u>GvHD Prophylaxis:</u>			
CSA/Steroids only	531	Reference	
Methotrexate	163	0.8 (0.7–1.02)	0.082
Tacrolimus	84	0.9 (0.7–1.2)	0.635
Other	93	0.8 (0.6–1.05)	0.103
Unknown	189	0.7 (0.5–0.8)	0.001
<u>Center /NYBC CB Units:</u>			
Non-US Center	253	0.7 (0.6–0.8)	<0.001
US Center/<50 Units	461	0.9 (0.8–1.1)	0.195
US Center/ \geq 50 Units	346	Reference	
<u>Transplant Year:</u>			
1993–2002	773	Reference	
2003–2006	287	1.7 (1.4–2.0)	<0.001
Platelet Count \geq50,000/mm³ by Day 270: (time unknown on 107 patients)			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	55	1.7 (1.2–2.4)	0.003
1–2 HLA Mismatch, NIMA Match	76	1.0 (0.7–1.4)	0.821
1–2 HLA Mismatch, no NIMA Match	883	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	351	Reference	
2 HLA Mismatch	608	0.9 (0.8–1.1)	0.456
TNC Dose/kg (natural log):	1014	1.4 (1.2–1.7)	0.001
<u>Ethnicity:</u>			
Non-Caucasian	438	0.7 (0.6–0.9)	0.003
Caucasian	554	Reference	
Unknown	22	0.9 (0.5–1.6)	0.688
<u>Patient Age at Transplant:</u>			
<10 Years	522	Reference	
\geq 10 Years	492	0.6 (0.5–0.8)	<0.001
<u>Preparatory Regimen:</u>			
Myeloablative	860	Reference	
Non-Myeloablative	36	2.3 (1.4–3.8)	0.001
Unknown	118	1.0 (0.7–1.4)	0.798
<u>GvHD Prophylaxis:</u>			
CSA/Steroids only	518	Reference	
Methotrexate	161	1.5 (1.1–1.9)	0.003
Tacrolimus	82	1.1 (0.8–1.6)	0.569
Other	89	1.1 (0.8–1.6)	0.489
Unknown	164	1.3 (0.9–1.7)	0.136
<u>Center/NYBC CB Units:</u>			
Non-US Center	236	0.7 (0.6–0.96)	0.026
US Center/<50 Units	440	0.8 (0.6–1.01)	0.061
US Center/ \geq 50 Units	338	Reference	
<u>Transplant Year:</u>			
1993–2002	752	Reference	
2003–2006	262	1.8 (1.4–2.2)	<0.001
Acute Grade 2–4 Graft vs. Host Disease (GvHD) by Day 150 in Patients who Engrafted: (data not reported on 73 patients)			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	47	0.6 (0.4–1.1)	0.092
1–2 HLA Mismatch, NIMA Match	52	0.7 (0.4–1.1)	0.120

End point: Variable	Number	RR* (95% CI)	P value
1-2 HLA Mismatch, no NIMA Match	634	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	254	Reference	
2 HLA Mismatch	432	1.3 (1.1-1.7)	0.013
<u>GvHD Prophylaxis:</u>			
CSA/Steroids only	423	Reference	
Methotrexate	119	0.9 (0.6-1.2)	0.406
Tacrolimus	62	0.6 (0.4-0.96)	0.033
Other	66	1.0 (0.7-1.4)	0.868
Unknown	63	1.4 (0.95-2.0)	0.089
<u>Center/NYBC CB Units:</u>			
Non-US Center	153	1.2 (0.9-1.6)	0.328
US Center/<50 Units	309	1.8 (1.4-2.3)	<0.001
US Center/≥50 Units	271	Reference	
Acute Grade 3-4 Graft vs. Host Disease (GvHD) by Day 150 in Patients who Engrafted: (data not reported on 73 patients)			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	47	0.3 (0.1-0.9)	0.028
1-2 HLA Mismatch, NIMA Match	52	0.9 (0.5-1.6)	0.693
1-2 HLA Mismatch, no NIMA Match	634	Reference	
Chronic Graft vs. Host Disease (GvHD) in Patients who Engrafted and Survived to Day 100: (data not reported on 139 patients)			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	33	0.9 (0.4-1.8)	0.677
1-2 HLA Mismatch, NIMA Match	34	1.1 (0.6-1.9)	0.839
1-2 HLA Mismatch, no NIMA Match	370	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	161	Reference	
2 HLA Mismatch	243	1.3 (0.9-1.8)	0.202
<u>Ethnicity:</u>			
Non-Caucasian	179	1.4 (0.98-2.0)	0.062
Caucasian	250	Reference	
Unknown	8	1.0 (0.3-4.3)	0.959
<u>Patient Age at Transplant:</u>			
<10 Years	247	Reference	
≥10 Years	190	2.1 (1.5-3.0)	<0.001
<u>Center/NYBC CB Units:</u>			
Non-US Center	78	1.6 (0.95-2.6)	0.076
US Center/<50 Units	185	2.1 (1.5-3.1)	<0.001
US Center/≥50 Units	174	Reference	
Relapse rate Over Three Years:			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	62	0.7 (0.4-1.2)	0.225
1-2 HLA Mismatch, NIMA Match	79	0.8 (0.5-1.3)	0.336
1-2 HLA Mismatch, no NIMA Match	980	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	388	Reference	
2 HLA Mismatch	671	0.8 (0.6-1.1)	0.177
<u>Diagnosis:</u>			
ALL	451	Reference	
AML	376	1.4 (1.03-1.9)	0.032
CML	116	0.6 (0.3-1.2)	0.133
Other Leukemia	53	1.8 (1.02-3.2)	0.043
Lymphoma/Multiple Myeloma	46	2.4 (1.3-4.4)	0.003
Myelodysplasia	79	1.2 (0.7-2.1)	0.514
<u>Risk (IBMTR Categories):</u>			
High (ALL, AML, CML)	242	1.9 (1.4-2.6)	<0.001
All Others	834	Reference	
Unknown (ALL, AML, CML)	45	0.9 (0.4-2.1)	0.864
Transplant-Related Mortality (TRM) over 3 Years.			
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	62	0.4 (0.2-0.7)	0.004
1-2 HLA Mismatch, NIMA Match	79	0.7 (0.5-0.97)	0.034
1-2 HLA Mismatch, no NIMA Match	980	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	388	Reference	
2 HLA Mismatch	671	1.3 (1.03-1.5)	0.022

End point: Variable	Number	RR* (95% CI)	P value
TNC Dose/kg (natural log):	1121	0.8 (0.6–0.9)	0.004
Patient Age at Transplant:			
<10 Years	570	Reference	
≥10 Years	551	1.6 (1.2–2.0)	<0.001
Ethnicity:			
Non-Caucasian	489	1.3 (1.1–1.6)	0.006
Caucasian	601	Reference	
Unknown	31	1.1 (0.6–2.0)	0.722
Risk (IBMTR Categories):			
High (ALL, AML, CML)	242	1.3 (1.1–1.6)	0.008
All Others	834	Reference	
Unknown (ALL, AML, CML)	45	1.3 (0.8–2.0)	0.315
Prior Transplant:			
None	927	Reference	
Allogeneic	35	1.4 (0.8–2.3)	0.189
Autologous	66	0.8 (0.6–1.2)	0.372
Unknown	93	0.9 (0.5–1.4)	0.515
Pre-Transplant CMV Antibody:			
Negative	451	Reference	
Positive	520	1.3 (1.1–1.6)	0.006
Unknown	150	1.6 (1.1–2.4)	0.026
Center/NYBC CB Units:			
Non-US Center	281	1.8 (1.4–2.3)	<0.001
US Center/<50 Units	488	1.5 (1.2–1.8)	0.001
US Center/≥50 Units	352	Reference	
Transplant Year:			
1993–2002	803	Reference	
2003–2006	318	0.6 (0.4–0.7)	<0.001
Overall Mortality in Three Years:			
HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:			
0 HLA Mismatch	62	0.5 (0.3–0.8)	0.002
1–2 HLA Mismatch, NIMA Match	79	0.7 (0.5–0.97)	0.029
1–2 HLA Mismatch, no NIMA Match	980	Reference	
HLA Mismatch (HLA-A, -B, -DRB1):			
1 HLA Mismatch	388	Reference	
2 HLA Mismatch	671	1.1 (0.9–1.3)	0.275
TNC Dose/kg (natural log):	1121	0.8 (0.7–0.97)	0.019
Patient Age at Transplant:			
<10 Years	570	Reference	
≥10 Years	551	1.4 (1.1–1.7)	0.003
Ethnicity:			
Non-Caucasian	489	1.2 (1.02–1.4)	0.025
Caucasian	601	Reference	
Unknown	31	1.1 (0.6–1.8)	0.742
Risk (IBMTR Categories):			
High (ALL, AML, CML)	242	1.5 (1.3–1.8)	<0.001
All Others	834	Reference	
Unknown (ALL, AML, CML)	45	1.2 (0.8–1.9)	0.336
Prior Transplant:			
None	927	Reference	
Allogeneic	35	1.4 (0.9–2.1)	0.136
Autologous	66	1.0 (0.7–1.3)	0.838
Unknown	93	0.9 (0.6–1.3)	0.589
Pre-Transplant CMV Antibody:			
Negative	451	Reference	
Positive	520	1.2 (1.04–1.4)	0.017
Unknown	150	1.4 (1.00–2.0)	0.048
Center/NYBC CB Units:			
Non-US Center	281	1.5 (1.2–1.9)	<0.001
US Center/<50 Units	488	1.4 (1.2–1.7)	<0.001
US Center ≥50 Units	352	Reference	
Transplant Year:			
1993–2002	803	Reference	
2003–2006	318	0.7 (0.6–0.9)	0.001
Treatment Failure (Relapse or Death) in 3 Years:			

End point: Variable	Number	RR* (95% CI)	P value
<u>HLA Mismatch (HLA-A, -B, -DRB1)/NIMA Match:</u>			
0 HLA Mismatch	62	0.5 (0.3–0.8)	0.002
1–2 HLA Mismatch, NIMA Match	79	0.7 (0.6–0.99)	0.049
1–2 HLA Mismatch, no NIMA Match	980	Reference	
<u>HLA Mismatch (HLA-A, -B, -DRB1):</u>			
1 HLA Mismatch	388	Reference	
2 HLA Mismatch	671	1.1 (0.9–1.3)	0.248
<u>TNC Dose/kg (natural log):</u>	1121	0.9 (0.7–1.02)	0.080
<u>Patient Age at Transplant:</u>			
<10 Years	570	Reference	
≥10 Years	551	1.3 (1.1–1.6)	0.004
<u>Ethnicity:</u>			
Non-Caucasian	489	1.2 (0.99–1.4)	0.060
Caucasian	601	Reference	
Unknown	31	1.1 (0.7–1.8)	0.656
<u>Risk (IBMTR Categories):</u>			
High (ALL, AML, CML)	242	1.5 (1.3–1.8)	<0.001
All Others	834	Reference	
Unknown (ALL, AML, CML)	45	1.1 (0.8–1.7)	0.514
<u>Prior Transplant:</u>			
None	927	Reference	
Allogeneic	35	1.5 (1.00–2.2)	0.048
Autologous	66	1.0 (0.7–1.3)	0.914
Unknown	93	0.9 (0.6–1.3)	0.544
<u>Pre-Transplant CMV Antibody:</u>			
Negative	451	Reference	
Positive	520	1.2 (1.02–1.4)	0.027
Unknown	150	1.4 (0.97–1.9)	0.072
<u>Center/NYBC CB Units:</u>			
Non-US Center	281	1.5 (1.2–1.8)	<0.001
US Center/<50 Units	488	1.4 (1.2–1.6)	<0.001
US Center/≥50 Units	352	Reference	
<u>Transplant Year:</u>			
1993–2002	803	Reference	
2003–2006	318	0.7 (0.6–0.9)	0.001