Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. Variables Considered in the Multivariable Analysis

Patient- and disease-specific characteristics, including:

- Age at the time of AHCT: continuous, 18-59 vs. ≥60
- Sex: female vs. male
- Race: Caucasian, African American, Asian, vs. others, missing
- KPS: 90-100 vs. <90 vs. missing
- Hematopoietic cell transplantation-comorbidity index: 0 vs. 1-2 vs. ≥3 vs. missing
- Remission status prior to AHCT (time from diagnosis to HCT): CR1 (≤6 months) vs. CR1 (>6 months) vs. CR2+ (>6 months) vs. PR (≤6 months) vs. PR (>6 months)

Transplantation-specific characteristics, including:

- Rituximab used in conditioning: Yes vs. No vs. missing

Abbreviations: AHCT = autologous hematopoietic cell transplant; CR = complete remission; KPS = Karnofsky performance status; PR = partial remission (includes any PR [e.g., PR1, PR2+]).

eTable 2. Multivariable Regression Analysis of Outcomes

	N	HR	Prob (95% CI)	*P*	Overall *P*
Relapse					
Conditioning Regimen					
TBC	263	1.00			<.0001
TT-BCNU	275	1.79	1.07-2.98	.03	
BEAM	65	4.34	2.45-7.70	<.0001	
Contrast					
TT-BCNU vs. BEAM		0.41	0.25-0.69	.0008	
NRM					
Conditioning Regimen					
TBC	263	1			.03
TT-BCNU	275	0.50	0.29-0.87	.01	
BEAM	65	0.50	0.20-1.28	.15	
Age					
18-59	309	1			.0001
≥60	294	2.99	1.70-5.25	.0001	
HCT-CI					
0	151	1			<.0001
1-2	186	1.65	0.66-4.14	.29	
≥3	263	4.39	1.95-9.84	.0003	
Contrast					
TT-BCNU vs. BEAM		1.00	0.38-2.67	.99	
HCT-CI: 1-2 vs. ≥3		0.38	0.20-0.70	.002	
PFS					
Conditioning Regimen					
TBC	263	1.00			.04
TT-BCNU	275	1.04	0.72-1.50	.86	
BEAM	65	1.74	1.10-2.75	.02	
Age					
18-59	309	1.00			.007

	N	HR	Prob (95% CI)	*P*	Overall *P*
≥60	294	1.58	1.13-2.75	.007	
KPS					
≥90	293	1.00	1.18-2.38		.01
<90%	294	1.68	0.60-3.92	.004	
Missing	16	1.53		.37	
Disease Status/Time from Diagnosis to HCT					
CR1 ≤6 month	161	1.00			.03
CR1 >6 months	177	1.65	0.98-.277	.06	
CR2+ >6 months	114	2.25	1.32-3.84	.003	
PR ≤6 months	44	1.46	0.69-3.10	.33	
PR >6 months	104	2.34	1.37-4.00	.002	
Missing	3	2.47	0.32-19.34	.39	
Contrast					
TT-BCNU vs. BEAM		0.60	0.38-0.94	.03	
CR1 >6 months vs. CR2+ >6 months		0.73	0.47-1.15	.17	
CR1 >6 months vs. PR ≤6 months		1.13	0.56-2.28	.73	
CR1 >6 months vs. PR >6 months		0.70	0.45-1.10	.12	
CR2+ >6 months vs. PR ≤6 months		1.54	0.75-3.14	.24	
CR2+ >6 months vs. PR >6 months		0.96	0.60-1.52	.86	
PR ≤6 months vs. PR >6 months		0.62	0.31-1.26	.18	
Overall Survival					
Conditioning Regimen (≤6 months after HCT)					
TBC	263	1.00			.008
TT-BCNU	275	0.35	0.17-0.73	.005	
BEAM	65	0.26	0.06-1.12	.07	
Conditioning Regimen (>6 months after HCT)					
TBC	232	1.00			.002
TT-BCNU	257	1.54	0.93-2.55	.10	
BEAM	62	2.73	1.56-4.76	.0004	

	N	HR	Prob (95% CI)	*P*	Overall *P*
Age					
18-59	309	1.00			.001
≥60	294	1.84	1.27-2.67	.001	
HCT-CI					
0	153	1.00			.004
1-2	186	1.24	0.73-2.09	.43	
≥3	264	2.04	1.27-3.28	.003	
Disease Status/					
Time from Diagnosis to HCT					
CR1 ≤6 months	161	1.00			.01
CR1 >6 months	177	2.05	1.12-3.76	.02	
CR2+ >6 months	114	2.42	1.30-4.53	.006	
PR ≤6 months	44	1.70	0.72-4.02	.23	
PR >6 months	104	3.29	1.79-6.04	.0001	
Missing	3	4.08	0.53-31.55	.18	
Contrast					
TT-BCNU vs. BEAM (≤6 months)		1.33	0.29-6.08	.71	
TT-BCNU vs. BEAM (>6 months)		0.56	0.33-0.96	.03	
HCT-CI: 1-2 vs. ≥3		0.61	0.40-0.92	.02	
CR1 >6 months vs. CR2+ >6 months		0.85	0.52-1.38	.50	
CR1 >6 months vs. PR ≤6 months		1.21	0.56-2.61	.63	
CR1 >6 months vs. PR >6 months		0.62	0.39-1.00	.05	
CR2+ >6 months vs. PR ≤6 months		1.43	0.65-3.13	.37	

Abbreviations: BEAM = carmustine, etoposide, cytarabine, melphalan; CR = complete remission; HCT-CI = hematopoietic cell transplantation comorbidity index; KPS = Karnofsky performance status; NRM = non-relapse mortality; OS = overall survival; PR = partial remission (includes any PR [e.g., PR1, PR2+]); PFS = progression-free survival; TBC = thiotepa, busulfan, cyclophosphamide; TT-BCNU = thiotepa, carmustine.

eTable 3. Univariable Subgroup Analysis of Outcomes by Age Group

	TBC Age ≤59 (N=147)	TT-BCNU Age ≤59 (N=131)	BEAM Age ≤59 (N=31)	TBC Age ≥60 (N=116)	TT-BCNU Age ≥60 (N=144)	BEAM Age ≥60 (N=34)		
Outcomes	**Prob (95% CI)**	**Prob (95% CI)**	**Prob (95% CI)**	**Prob (95% CI)**	**Prob (95% CI)**	**Prob (95% CI)**	***P*** **Age ≤59**	***P*** **Age ≥60**
NRM							.70	.08
100-day	3% (1-6)	0%	0%	11% (6-18)	4% (1-7)	0%		<.001
1-year	4% (2-8)	1% (0-3)	3% (0-12)	17% (11-25)	7% (4-12)	6% (1-17)	.01	.04
3-year	6% (2-10)	6% (2-13)	3% (0-12)	21% (14-29)	13% (7-22)	10% (2-24)	.004	.22
Relapse							<.001	.04
1-year	5% (2-9)	12% (7-19)	19% (7-35)	7% (3-13)	7% (4-12)	26% (12-42)	.02	.08
3-year	8% (4-14)	15% (8-22)	43% (24-62)	14% (8-23)	15% (8-22)	30% (15-47)	.002	.25
PFS							<.001	.25
1-year	91% (86-95)	87% (80-92)	78% (61-90)	76% (67-83)	86% (79-91)	68% (51-83)	.16	.04
3-year	86% (79-92)	79% (70-87)	54% (35-72)	65% (55-74)	72% (62-81)	60% (43-77)	.005	.43
OS							.13	.06
1-year	92% (88-96)	94% (89-97)	90% (77-98)	82% (74-88)	90% (85-94)	88% (75-97)	.82	.17
3-year	90% (84-95)	81% (71-89)	73% (55-88)	69% (59-78)	76% (66-85)	57% (39-74)	.05	.15

Abbreviations: BEAM = carmustine, etoposide, cytarabine, melphalan; NRM = non-relapse mortality; OS = overall survival; PFS = progression-free survival; TBC = thiotepa, busulfan, cyclophosphamide; TT-BCNU = thiotepa, carmustine.

eTable 4. Conditioning Chemotherapy Regimen Details

	TBC (N=263)	TT-BCNU (N=275)	BEAM (N=65)*
Chemotherapy Agent	Mean; Median (range)	Mean; Median (range)	Mean; Median (range)
Thiotepa (mg/kg)	17; 18 (5-23)	15; 20 (8-30)	-
Busulfan (mg/kg)	9; 10 (6-17)	-	-
Cyclophosphamide (mg/kg)	116; 120 (60-125)	-	-
BCNU (mg/m^2)	-	398; 400 (300-400)	299; 300 (240-300)
Etoposide (mg/m^2)	-	-	969; 800 (400-1645)
Cytarabine (mg/m^2)	-	-	1600; 1600 (1600-1600)
Melphalan (mg/m^2)	-	-	139; 140 (100-140)

Abbreviations: BEAM = carmustine, etoposide, cytarabine, melphalan; TBC = thiotepa, busulfan, cyclophosphamide; TT-BCNU = thiotepa, carmustine.

*: BEAM cohort included 7 patients who received a 'BEAM-like' regimen wherein melphalan was substituted with a comparable alkylator(s).

eTable 5. Multivariate Regression – Inverse Probability Weighted Estimator Based on Propensity Score and Inverse Probability Censoring Weighted Estimator

	N	HR	Prob (95% CI)	*P*	Overall *P*
Relapse (IPWE-PS)					
Conditioning Regimen					
TBC	254	1.00			.002
TT-BCNU	264	1.79	0.99-3.25	.05	
BEAM	63	4.20	1.92-9.22	<.0001	
Relapse (IPCW)					
Conditioning Regimen					
TBC	254	1.00			<.0001
TT-BCNU	264	1.23	0.64-2.34	.54	
BEAM	63	5.87	2.93-11.79	<.0001	
NRM (IPWE-PS)					
Conditioning Regimen					
TBC	254	1.00			.03
TT-BCNU	264	0.45	0.25-0.82	.009	
BEAM	63	0.33	0.03-3.97	.38	
NRM (IPCW)					
Conditioning Regimen					
TBC	254	1.00			.38
TT-BCNU	264	0.59	0.28-1.25	.17	
BEAM	63	0.61	0.01-28.75	.80	
PFS (IPWE-PS)					
Conditioning Regimen					
TBC	254	1.00			.20
TT-BCNU	264	0.99	0.66-1.48	.95	
BEAM	63	1.70	0.89-3.25	.10	
PFS (IPCW)					
Conditioning Regimen					
TBC	254	1.00			.02
TT-BCNU	264	0.82	0.48-1.37	.44	
BEAM	63	2.04	1.08-3.87	.03	

	N	HR	Prob (95% CI)	*P*	Overall *P*
OS (IPWE-PS)					
Conditioning Regimen (≤6 Months Post-HCT)					
TBC	254	1.00			.007
TT-BCNU	266	0.28	0.12-0.62	.002	
BEAM	65	0.13	0.00-0.37	<.0001	
Conditioning Regimen (>6 Months Post-HCT)					
TBC	224	1.00			.04
TT-BCNU	249	1.45	0.86-2.43	.16	
BEAM	62	2.50	1.23-5.10	.01	
OS (IPCW)					
Conditioning Regimen (≤6 Months Post-HCT)					
TBC	254	1.00			.09
TT-BCNU	266	0.34	0.13-0.91	.03	
BEAM	65	0.38	0.00-1.29	.07	
Conditioning Regimen (>6 Months Post-HCT)					
TBC	224	1.00			.01
TT-BCNU	249	1.60	0.70-3.64	.26	
BEAM	62	4.04	1.63-10.02	.003	

Abbreviations: BEAM = carmustine, etoposide, cytarabine, melphalan; IPCW = inverse probability of censoring weighted estimator; IPWE-PS = inverse probability weighted estimator based on propensity score; NRM = non-relapse mortality; OS = overall survival; PFS = progression-free survival; TBC = thiotepa, busulfan, cyclophosphamide; TT-BCNU = thiotepa, carmustine.

Missing values in time from diagnosis to HCT and KPS were excluded from the sensitivity analysis.