

Supplemental Table 1. Treatment Modalities

Frontline*	
Regimen	n
CHOP/CHOP-like	44
EPOCH	220
<u>High Intensity</u> Hyper-CVAD CODOX-M/IVAC	13 13
<u>Other</u> Other multi-agent regimen Low-intensity myeloma regimen Radiation alone Surgery alone Biologic agent alone EBV-targeting CTLs	15 4 9 4 3 1
<u>None</u> Palliative/hospice ART alone	12 2
Unknown	4

*

Low-intensity Myeloma Regimen: anti-CD38 agent, proteasome inhibitor, and/or immunomodulatory agent-based regimen

Other multi-agent regimen = multi-agent, high-dose chemotherapy not consistent with other categories (e.g. VDT-PACE, bendamustine-based regimens, multi-agent cyclophosphamide-based regimens, etc.)

ICE = Ifosfamide, Carboplatin, and Etoposide

DHAP/Similar = DHAP, DHAC, DHAX, or ESHAP

(cytarabine, platinum-based agent, and glucocorticoid)

Low-intensity Myeloma Regimen = anti-CD38 agent,
proteasome inhibitor, and/or immunomodulatory agent-
based regimen

GemOx/Similar = GemOx, GIFOx, GDP, or GemCarbo
(gemcitabine and platinum-based agent)

Second-line**	
Regimen	n
ICE	30
DHAP/similar	23
Low-intensity myeloma regimen	19
GemOx/similar	8
<u>Other</u>	
EPOCH	5
CHOP/CHOP-like	2
Hyper-CVAD	6
CODOX-M/IVAC	3
Radiation alone	5
Other	12

Supplemental Table 2. Unadjusted and Propensity Score Adjusted Characteristics by Immune Status Cohort
(three group propensity score model)

	Unadjusted	Unadjusted	Unadjusted	Adjusted	Adjusted	Adjusted
	HIV	IC	OIS	HIV	IC	OIS
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
IPI at diagnosis						
Mean (SD)	2.44 (1.30)	2.40 (1.60)	2.87 (1.37)	2.52 (1.34)	2.41 (1.52)	2.37 (1.42)
Age at Dx (years)						
Mean (SD)	45.66 (10.37)	63.86 (16.51)	62.72 (17.09)	48.92 (12.85)	58.66 (17.05)	53.90 (18.29)
Year of diagnosis						
Mean (SD)	2015.3 (4.5)	2016.9 (3.6)	2017.58 (3.6)	2015.8 (4.4)	2016.7 (3.8)	2016.7 (3.6)
	N (%)	N (%)	N (%)	%	%	%
Race						
Non-Black	118 (72.0%)	114 (91.5%)	31 (84.9%)	74.3%	87.0%	77.7%
Black	46 (28.0%)	11 (8.5%)	5 (15.1%)	25.7%	13.0%	22.3%
Sex						
Male	141 (86.0%)	94 (75.2%)	22 (61.1%)	85.9%	75.1%	66.9%
Female	23 (14.0%)	31 (24.8%)	14 (38.9%)	14.1%	24.9%	33.1%
Ethnicity						
Hispanic	65 (39.7%)	42 (33.3%)	14 (38.5%)	40.9%	36.0%	37.0%
Non-Hispanic	99 (60.3%)	83 (66.7%)	22 (61.5%)	59.1%	64.0%	63.0%
MYC and EBV						
MYC+/EBV+	74 (44.8%)	27 (21.5%)	6 (15.6%)	38.6%	25.1%	23.4%
MYC+/EBV-	21 (12.6%)	37 (29.5%)	14 (40.1%)	16.3%	27.8%	30.0%
MYC-/EBV+	56 (33.9%)	31 (24.5%)	7 (20.6%)	32.5%	25.2%	26.8%
MYC-/EBV-	14 (8.7%)	31 (24.5%)	9 (23.8%)	12.6%	21.9%	19.7%
1L Chemotherapy Regimen						
CHOP	20 (12.0%)	18 (14.6%)	11 (31.4%)	10.4%	14.2%	19.7%
EPOCH	113 (68.6%)	83 (66.2%)	21 (58.8%)	67.0%	66.3%	72.8%
Other	32 (19.4%)	24 (19.2%)	4 (9.9%)	22.5%	19.4%	7.6%
PI in 1L						
No	117 (71.3%)	80 (64.0%)	28 (77.8%)	66.1%	67.4%	71.1%
Yes	47 (28.7%)	45 (36.0%)	8 (22.2%)	33.9%	32.6%	28.9%
Radiation in 1L						
No	143 (86.9%)	89 (71.3%)	30 (83.3%)	80.6%	74.7%	82.7%
Yes	21 (13.1%)	36 (28.7%)	6 (16.7%)	19.4%	25.3%	17.3%
CNS ppx						
None	85 (52.1%)	76 (61.1%)	29 (80.8%)	54.2%	59.1%	75.6%
IT	58 (35.3%)	36 (28.9%)	6 (15.8%)	34.6%	30.9%	21.4%
HD IV	21 (12.7%)	12 (10.0%)	1 (3.3%)	11.2%	10.0%	3.0%

Ann Arbor Stage						
I/II	35 (21.3%)	42 (33.3%)	8 (22.2%)	20.9%	26.6%	26.4%
III/IV	129 (78.7%)	83 (66.7%)	28 (77.8%)	79.1%	73.4%	73.6%
ECOG PS 2+						
No	120 (73.0%)	93 (74.5%)	26 (73.5%)	70.3%	75.5%	84.3%
Yes	44 (27.0%)	32 (25.5%)	10 (26.5%)	29.7%	24.5%	15.7%
LDH > 3x ULN						
No	124 (75.4%)	105 (84.3%)	28 (77.5%)	78.5%	82.5%	77.2%
Yes	40 (24.6%)	20 (15.7%)	8 (22.5%)	21.5%	17.5%	22.8%
2+ Extranodal Sites						
No	84 (51.4%)	70 (55.7%)	22 (61.1%)	48.6%	52.9%	54.9%
Yes	80 (48.6%)	55 (44.3%)	14 (38.9%)	51.4%	47.1%	45.1%

Supplemental Table 3. Unadjusted and Propensity Score Adjusted Characteristics by Immune Status Cohort
(two group propensity score model)

	Unadjusted	Unadjusted	Adjusted	Adjusted
	HIV	IC	HIV	IC
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
IPI at diagnosis				
Mean (SD)	2.43 (1.29)	1.98 (1.62)	2.25 (1.38)	2.02 (1.52)
Age at Dx (years)				
Mean (SD)	45.30 (9.95)	54.46 (14.32)	46.84 (9.71)	42.10 (17.66)
Year of diagnosis				
Mean (SD)	2015.2 (4.5)	2016.5 (4.0)	2015.5 (4.5)	2016.1 (3.6)
	N (%)	N (%)	%	%
Race				
Non-Black	117 (72.3%)	70 (92.1%)	76.9%	78.8%
Black	45 (27.7%)	6 (7.9%)	23.1%	21.2%
Sex				
Male	139 (85.8%)	58 (76.3%)	82.9%	80.7%
Female	23 (14.2%)	18 (23.7%)	17.1%	19.3%
Ethnicity				
Hispanic	64 (39.2%)	24 (31.9%)	36.2%	27.5%
Non-Hispanic	98 (60.8%)	52 (68.1%)	63.8%	72.5%
MYC and EBV				
MYC+/EBV+	73 (45.1%)	15 (19.9%)	39.0%	35.5%
MYC+/EBV-	20 (12.5%)	24 (31.1%)	16.7%	19.1%
MYC-/EBV+	55 (34.0%)	18 (24.0%)	31.3%	29.0%
MYC-/EBV-	14 (8.4%)	19 (25.0%)	13.0%	16.5%
1L Chemotherapy Regimen				
CHOP	20 (12.1%)	7 (9.5%)	10.8%	7.9%
EPOCH	112 (68.9%)	53 (69.5%)	69.0%	72.6%
Other	31 (19.0%)	16 (20.9%)	20.2%	19.6%
PI in 1L				
No	116 (71.6%)	42 (55.3%)	68.2%	72.9%
Yes	46 (28.4%)	34 (44.7%)	31.8%	27.1%
Radiation in 1L				0.0%
No	142 (87.4%)	50 (65.5%)	82.9%	78.1%
Yes	20 (12.6%)	26 (34.5%)	17.1%	21.9%
CNS ppx				
None	84 (52.0%)	45 (58.7%)	54.8%	62.7%
IT	57 (35.5%)	25 (32.3%)	34.2%	29.9%
HD IV	20 (12.6%)	7 (9.0%)	10.9%	7.4%

Ann Arbor Stage				
I/II	35 (21.6%)	28 (36.4%)	25.9%	19.4%
III/IV	127 (78.4%)	48 (63.6%)	74.1%	80.6%
ECOG PS 2+				
No	119 (73.3%)	62 (81.9%)	76.0%	84.0%
Yes	43 (26.7%)	14 (18.1%)	24.0%	16.0%
LDH > 3x ULN				
No	122 (75.1%)	65 (84.9%)	78.7%	87.7%
Yes	40 (24.9%)	12 (15.1%)	21.3%	12.3%
2+ Extranodal Sites				
No	84 (52.0%)	46 (60.0%)	53.1%	56.0%
Yes	78 (48.0%)	30 (40.0%)	46.9%	44.0%

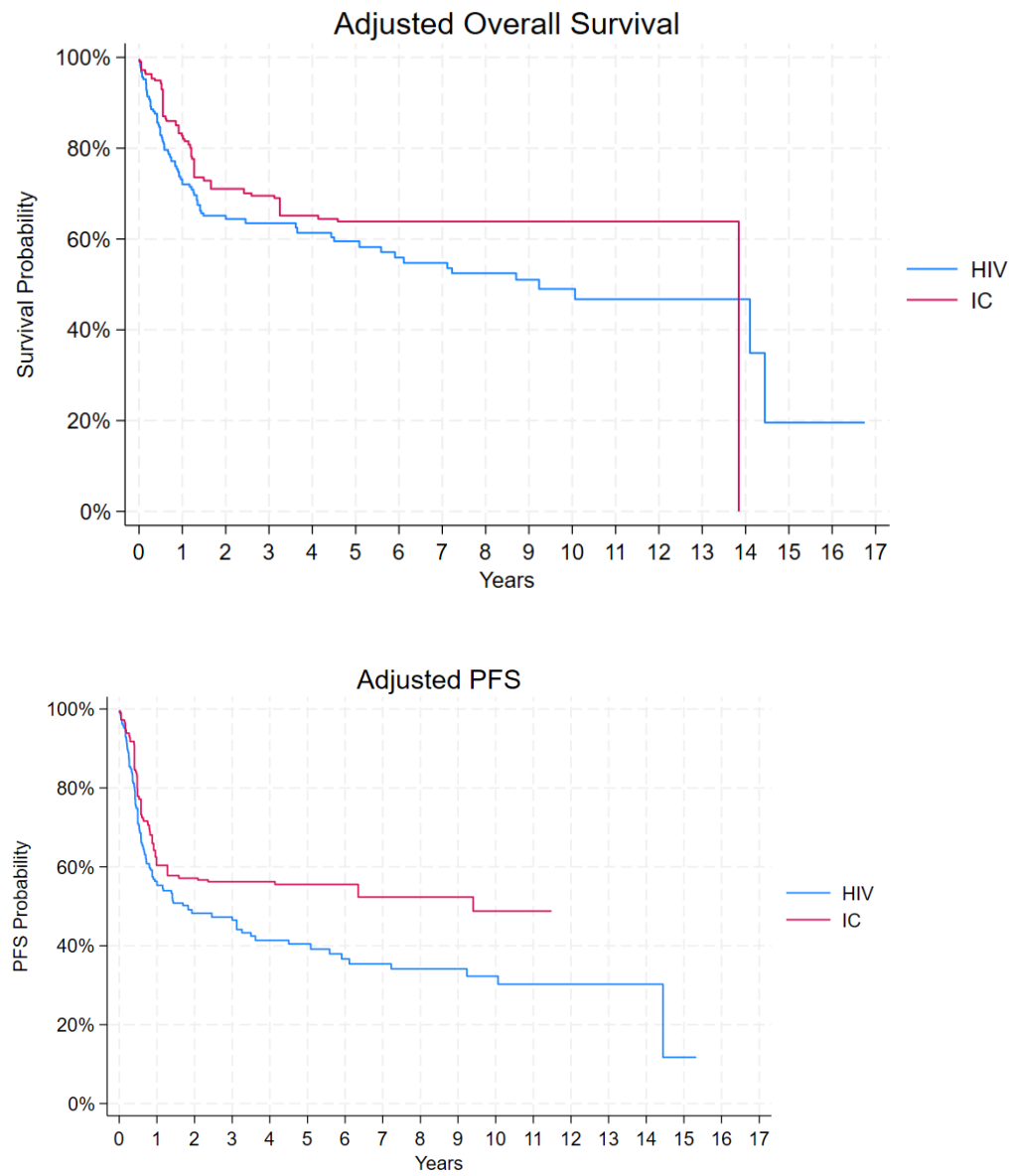
The two group model was conducted as a sensitivity analysis to see if results changed after achieving better balance for these groups than in the three-group model.

Supplemental Table 4. Additional univariable survival analyses using non-imputed data.

Risk Factor	Univariable Analysis, OS		
	HR	95% CI	p-value*
Nodal disease	1.63	1.15-2.31	0.006
BM involvement	1.73	1.21-2.48	0.003
CNS involvement	1.67	0.81-3.43	0.165
H&N involvement	0.45	0.31-0.67	0.000
<u>IPI (vs 0)</u>			
1	1.07	0.39-2.94	0.902
2	2.34	0.96-5.69	0.061
3	3.63	1.55-8.51	0.003
4	7.19	3.02-17.12	0.000
5	8.42	3.08-22.99	0.000
CD19+	1.14	0.58-2.25	0.712
CD20+	1.12	0.66-1.92	0.657
CD30+	1.26	0.83-1.92	0.278
CD38+	0.94	0.46-1.95	0.877
CD138+	0.86	0.53-1.39	0.531
Ki67	1.01	0.99-1.02	0.064
Consolidative RT in 1st Remission	0.57	0.37-0.88	0.012
Consolidative ASCT in 1st Remission	0.45	0.22-0.92	0.029

*Boded p-values are statistically significant

Supplemental Figure 1. Survival outcomes using a binary propensity score logistic regression in a two-group model.



Adjusted OS (a), Adjusted PFS (b)