

Supplemental Tables:

Supplemental Table 1: Baseline Characteristics of Patients Treated with Axi-Cel Based on Subsequent Relapse Status.

	No PD	PD	p
N	139	136	
Age (median, interquartile range)	61 (54-67)	58 (48-65)	0.049
Sex = Male (%)	80 (57.6)	100 (73.5)	0.008
ECOG Performance Status = 0-1 (%)	126 (90.6)	105 (77.2)	0.004
Disease (%)			0.423
DLBCL	90 (64.7)	98 (72.1)	
PMBL	11 (7.9)	8 (5.9)	
TFL	38 (27.3)	30 (22.1)	
Double Expressor (%)			0.20
No	82 (61.2)	68 (50.4)	
Unknown	11 (8.2)	15 (11.1)	
Yes	41 (30.6)	52 (38.5)	
Double/Triple Hit (%)*			0.337
No	106 (76.8)	97 (72.4)	
Unknown	8 (5.8)	5 (3.7)	
Yes	24 (17.4)	32 (23.9)	
Cell_of_Origin by Hans algorithm (%)			0.30
Non-GC	44 (32.4)	53 (41.1)	
GC	80 (58.8)	68 (52.7)	
Unknown	12 (8.8)	8 (6.2)	
IPI = 0-2 (%)	79 (56.8)	54 (39.7)	0.007
Stage (%)			0.373
I/II	29 (20.9)	22 (16.3)	
III/IV	109 (78.4)	113 (83.7)	
Prior Lines of Therapy (median, interquartile range)	3 (2-4)	4 (3-5)	0.04
Bulky Disease = Yes (%)	24 (17.3)	34 (25.0)	0.154
Prior ASCT = Yes (%)	48 (34.5)	41 (30.1)	0.517
Bridging Therapy = Yes (%)	65 (46.8)	79 (58.1)	0.079
ZUMA-1 Eligible at Apheresis = Yes (%)	98 (70.5)	67 (49.3)	0.001
Neurotoxicity = Grade 3-4 (%)	42 (30.4)	42 (30.9)	1
CRS = Grade 3-4 (%)	8 (5.8)	10 (7.4)	0.783
Abbreviations: PD, Progression of Disease, DLBCL, diffuse large B-cell lymphoma; PMBL, primary mediastinal B-cell lymphoma; TFL, transformed follicular lymphoma; GC, germinal center; IPI, international prognostic index; ASCT, autologous stem cell transplant; CRS, cytokine release syndrome.			
*Chromosomal translocation for MYC and BCL-2, and/or BCL-6. Bulky disease defined as ≥10cm.			

Supplemental Table 2: CD19 expression cutoff and antibody clones used for immunohistochemistry and flow cytometry at sites participating in US CAR-T Cell Consortium.

Center	CD19 Cutoff	IHC clone	Flow cytometry clone
MD Anderson Cancer Center	>20%	NA	SJ25C1 and J3-119
Moffitt Cancer Institute	Flow based: greater than 10 ³	MRQ-36	J3-119
Stanford University Medical Center	90% flow, 50% IHC	BT5E1	SJ25C1
Maryland University Medical Center	70%	EP169	SJ25C1
University of California, San Francisco	Flow based only, qualitative	Not used	J3-119
Kansas University Medical Center	IHC: 1% Flow: 20%	MRQ-36	MRQ-36
Karmanos Cancer Institute	70%	MRQ-36	SJ25C1
Nebraska University Medical Center	No defined cutoff	EP169	SJ25C1
University of Miami	Present or absent	BT5E1	J3-119
Washington University	IHC present or absent, flow 30%	MRQ-36	JS-119
Banner MD Anderson Cancer Center	20%	Not used	J3-119
Cleveland Clinic	No defined cutoff	BT5E1	SJ25C1
UPMC Hillman Cancer Center	Present or absent	MRQ-36	SJ25C1

Supplementary Table 3: Description of first Salvage Therapy post axi-cel relapse with selected baseline demographics

Primary therapy Class	Primary Therapy Description	Secondary Therapy	Secondary Therapy Description	Best Response to first post axi-cel therapy	CRS	CRES	Bridging Therapy Pre Axi-cel	Time from Axi-cel Infusion to PD (m)
Checkpoint-based	Pembrolizumab			CR	1	0	Yes	3.00
Checkpoint-based		Radiation		CR	1	0	No	2.13
Checkpoint-based	Nivolumab			CR	0	0	Yes	2.83
Checkpoint-based				CR	2	3	No	5.00
Checkpoint-based	Pembrolizumab	Radiation		CR	0	0	No	0.61
Checkpoint-based	Atezolizumab			PR	2	1	Yes	1.03
Checkpoint-based	Atezolizumab			PR	2	2	Yes	3.26
Checkpoint-based	Atezolizumab			PR	2	1	No	2.94
Checkpoint-based	Pembrolizumab	Steroids		PR	2	1	Yes	2.13
Checkpoint-based				PR	2	0	No	2.84
Checkpoint-based		Steroids		PR	2	2	Yes	6.07
Checkpoint-based	Pembrolizumab	Radiation		PR	1	1	Yes	2.84
Checkpoint-based	Pembrolizumab			PR	1	0	Yes	2.52
Checkpoint-based	Pembrolizumab	Radiation	45 Gy	PR	1	0	No	1.23
Checkpoint-based	Pembrolizumab			PR	1	4	No	1.20
Checkpoint-based	Nivolumab	Steroids	Prednisone 40 mg x 7 days	PR	1	2	No	2.40
Checkpoint-based				PR	0	0	No	0.93
Checkpoint-based				PR	0	0	Yes	2.65
Checkpoint-based	Nivolumab			PR	0	0	Yes	5.57

Checkpoint-based	Nivolumab	Novel Therapy	Varilumab	SD	1	2	Yes	5.77
Checkpoint-based	Pembrolizumab	Non-len Targeted Therapy	Idelalisib + Ibrutinib	SD	1	0	No	2.71
Checkpoint-based	Pembrolizumab	Non-len Targeted Therapy	Ibrutinib + Rituximab	SD	2	0	Yes	2.00
Checkpoint-based		Radiation		SD	2	4	Yes	2.90
Checkpoint-based	Pembrolizumab	Chemotherapy	Intravitreal methotrexate	SD	1	3	Yes	14.50
Checkpoint-based	Pembrolizumab			SD	2	2	Yes	1.26
Checkpoint-based		Radiation	Radiation and Rituximab	SD	2	2	No	2.65
Checkpoint-based	Nivolumab	Non-len Targeted Therapy	Ibrutinib	SD	1	0	No	2.07
Checkpoint-based	Atezolizumab			PD	1	1	No	3.48
Checkpoint-based	Pembrolizumab			NA	2	2	No	15.10
Checkpoint-based	Pembrolizumab	Radiation		NA	2	0	No	2.90
Chemotherapy	R-IVAC	Allo-SCT	9/10 MUD	CR	1	0	No	0.87
Chemotherapy	R-ICE			CR	1	0	No	6.42
Chemotherapy	R-Gem-Ox			PR	2	3	No	4.17
Chemotherapy	R-MTX-Ara-C			PR	1	2	Yes	5.10
Chemotherapy	Gem-Ox-Benda-Ara-C			PR	2	2	Yes	3.97
Chemotherapy	Obinutuzumab + Bendamustine			PR	1	0	Yes	3.39
Chemotherapy	R-GDP			PR	2	1	Yes	3.00
Chemotherapy	Liposomal Vincristine			PR	2	1	Yes	2.39
Chemotherapy	R-Gem-Ox			PR	3	3	Yes	3.23
Chemotherapy	Intraocular methotrexate			PR	2	3	No	8.73
Chemotherapy	Bendamustine + Rituximab			PR	2	3	Yes	1.00
Chemotherapy	R-ICE			PR	2	3	Yes	1.90
Chemotherapy	R-Gem	Radiation		PR	0	0	Yes	0.83

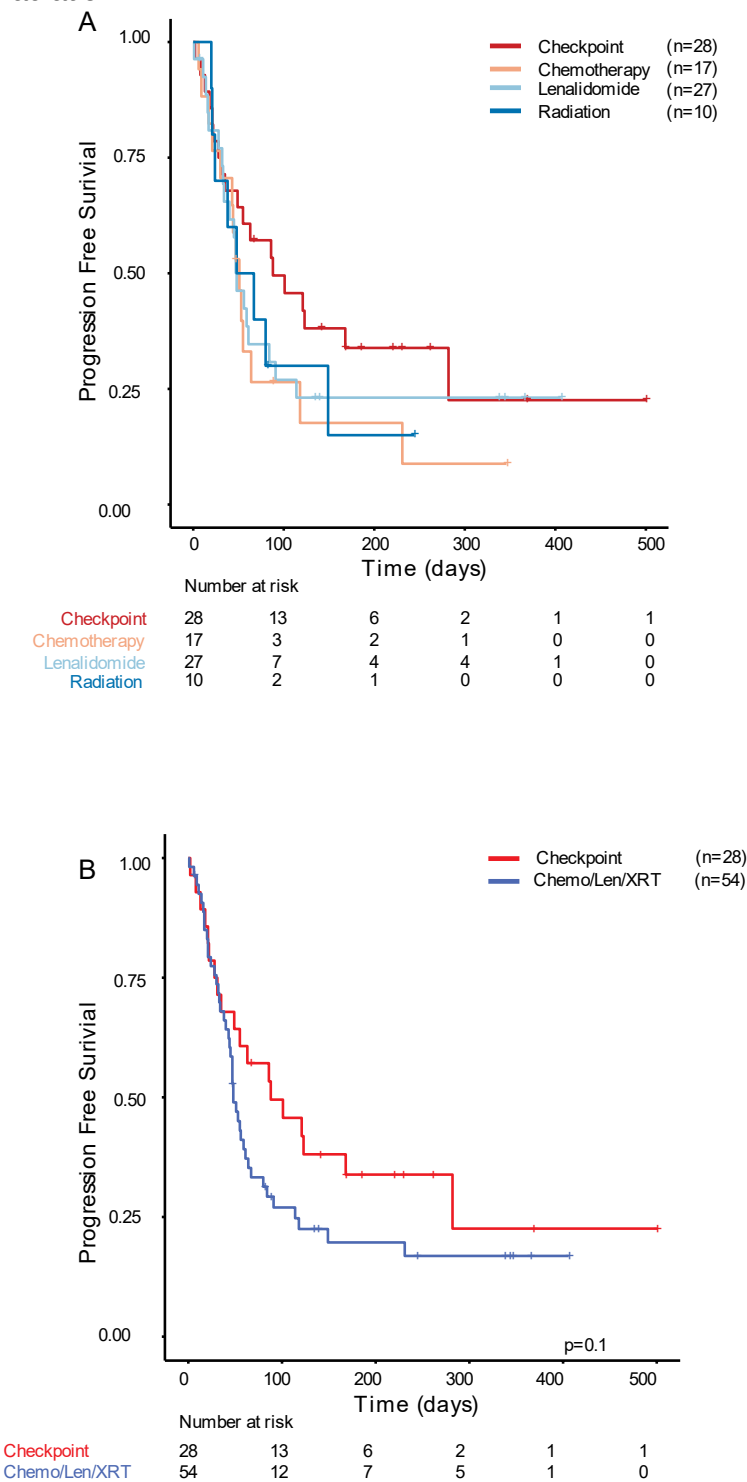
Chemotherapy	Bendamustine + Rituximab			PR	1	1	Yes	0.93
Chemotherapy	R-EPOCH			PR	0	0	No	3.84
Chemotherapy	Part B of Hyper CVAD			PR	2	1	No	2.52
Chemotherapy	R-GVP			SD	2	2	Yes	2.97
Lenalidomide-based	Lenalidomide + Rituximab			CR	2	2	No	5.87
Lenalidomide-based	Lenalidomide + Rituximab			CR	2	0	Yes	4.16
Lenalidomide-based	Lenalidomide			CR	1	0	No	2.94
Lenalidomide-based	Lenalidomide + Rituximab			CR	2	4	Yes	3.03
Lenalidomide-based	Lenalidomide + Obinutuzumab			CR	2	3	No	7.00
Lenalidomide-based	Lenalidomide + Rituximab			PR	1	3	Yes	8.33
Lenalidomide-based	Lenalidomide + Rituximab			PR	1	2	Yes	6.43
Lenalidomide-based	Lenalidomide + Rituximab			PR	2	3	No	1.10
Lenalidomide-based	Lenalidomide + Rituximab	Radiation		PR	1	0	Yes	2.97
Lenalidomide-based	Lenalidomide + Rituximab			PR	2	1	Yes	3.03
Lenalidomide-based	Lenalidomide	Radiation		PR	2	2	No	3.90
Lenalidomide-based	Lenalidomide			PR	2	3	Yes	3.30
Lenalidomide-based	Lenalidomide + Rituximab			PR	2	0	No	6.97
Lenalidomide-based	Lenalidomide + Rituximab			PR	2	0	No	6.13
Lenalidomide-based	Lenalidomide + Rituximab			PR	1	0	Yes	1.45
Lenalidomide-based	Lenalidomide + Rituximab			PR	2	2	No	3.06
Lenalidomide-based	Lenalidomide + Rituximab			PR	2	2	No	7.32
Lenalidomide-based	Lenalidomide			PR	1	2	Yes	0.55
Lenalidomide-based	Lenalidomide + Obinutuzumab			PR	1	2	Yes	3.39
Lenalidomide-based	Lenalidomide			PR	3	3	Yes	0.94

Lenalidomide-based	Lenalidomide + Rituximab			PR	1	3	No	3.97
Lenalidomide-based	Lenalidomide + Obinutuzumab			PR	1	3	Yes	4.35
Lenalidomide-based	Lenalidomide			PR	2	4	Yes	0.73
Lenalidomide-based	Lenalidomide			PR	0	0	No	3.06
Lenalidomide-based	Lenalidomide + Rituximab	Non-len Targeted Therapy	Ibrutinib	PR	1	2	No	2.37
Lenalidomide-based	Lenalidomide + Rituximab	Radiation		PD	1	0	No	3.03
Lenalidomide-based	Lenalidomide + Rituximab	Non-len Targeted Therapy	Polatuzumab	PD	2	2	Yes	12.00
Non-len Targeted Therapy	Ibrutinib	Radiation	30 Gy	CR	2	1	Yes	11.36
Non-len Targeted Therapy	Brentuximab			PR	2	1	No	0.81
Non-len Targeted Therapy	Venetoclax + Rituximab			PR	0	0	No	2.90
Non-len Targeted Therapy	Ibrutinib + Rituximab			SD	2	0	Yes	0.87
Non-len Targeted Therapy	Brentuximab			NA	2	0	No	3.90
Novel Therapy				PR	2	1	No	4.29
Novel Therapy	Mosunetuzumab			PR	0	0	No	10.17
Novel Therapy	GSK3326595			PR	1	3	Yes	3.00
Novel Therapy	GSK3326595			PR	1	3	No	3.00
Novel Therapy	BET inhibitor			PR	2	4	No	1.97
Novel Therapy	REGN1979			SD	0	0	No	1.07
Novel Therapy	ADCT-402	Steroids		SD	1	2	Yes	4.70
Novel Therapy	GSK3326595			PD	2	3	Yes	3.00
Radiation				CR	2	3	Yes	6.16
Radiation	45Gy			CR	0	0	Yes	9.00
Radiation				PR	1	1	No	3.06
Radiation				PR	1	0	No	2.35
Radiation	External Beam Radiation			PR	3	2	Yes	2.45

Radiation				PR	0	0	No	3.03
Radiation	2520 cGy to scrotum			PR	1	0	No	4.23
Radiation	45 Gy to spleen, 50 Gy to chest wall mass	Rituximab	Weekly rituximab x 4	PR	0	0	Yes	1.00
Radiation				PR	1	1	Yes	1.03
Radiation				SD	2	3	Yes	3.16
Allo-SCT	Sib Allo-HCT w/ BuCy			PR	1	2	Yes	3.00
Second CAR-T	PBCAR0191 allogeneic CD19 CAR T			SD	2	0	No	12.17
Steroids				PR	2	2	Yes	3.03

Supplemental Figures:

Supplemental Figure 1: Progression free survival for the first therapy after axi-cel progression. Therapies with ≥ 10 patients were selected for PFS analysis. (A) Unstratified KM analysis. (B) Checkpoint therapy compared to a grouping of chemotherapy, lenalidomide and radiation.



**Supplemental Figure 2: PFS for checkpoint-inhibitor based
Therapy as the first therapy after axi-cel progression stratified by disease histology.**
DLBCL (Diffuse large B-cell lymphoma), PMBCL (Primary Mediastinal B-cell lymphoma, TFL
(Transformed Follicular lymphoma)

