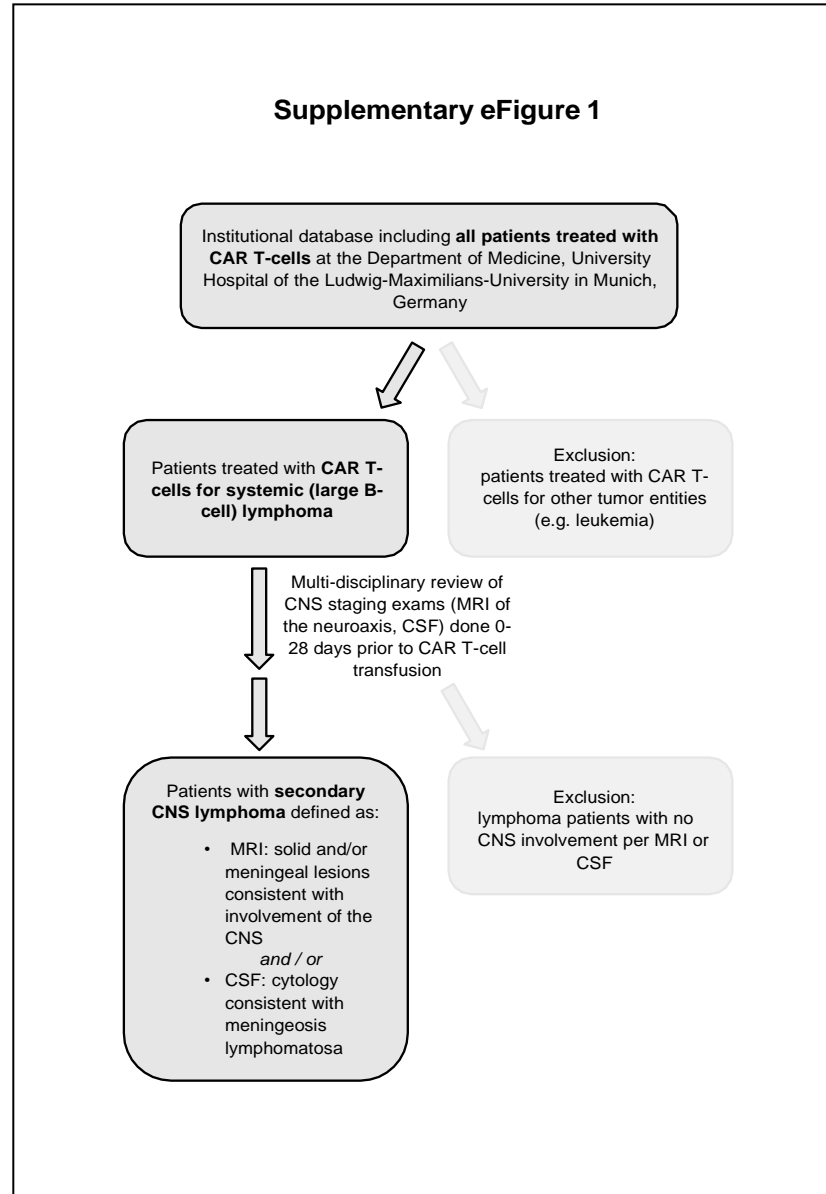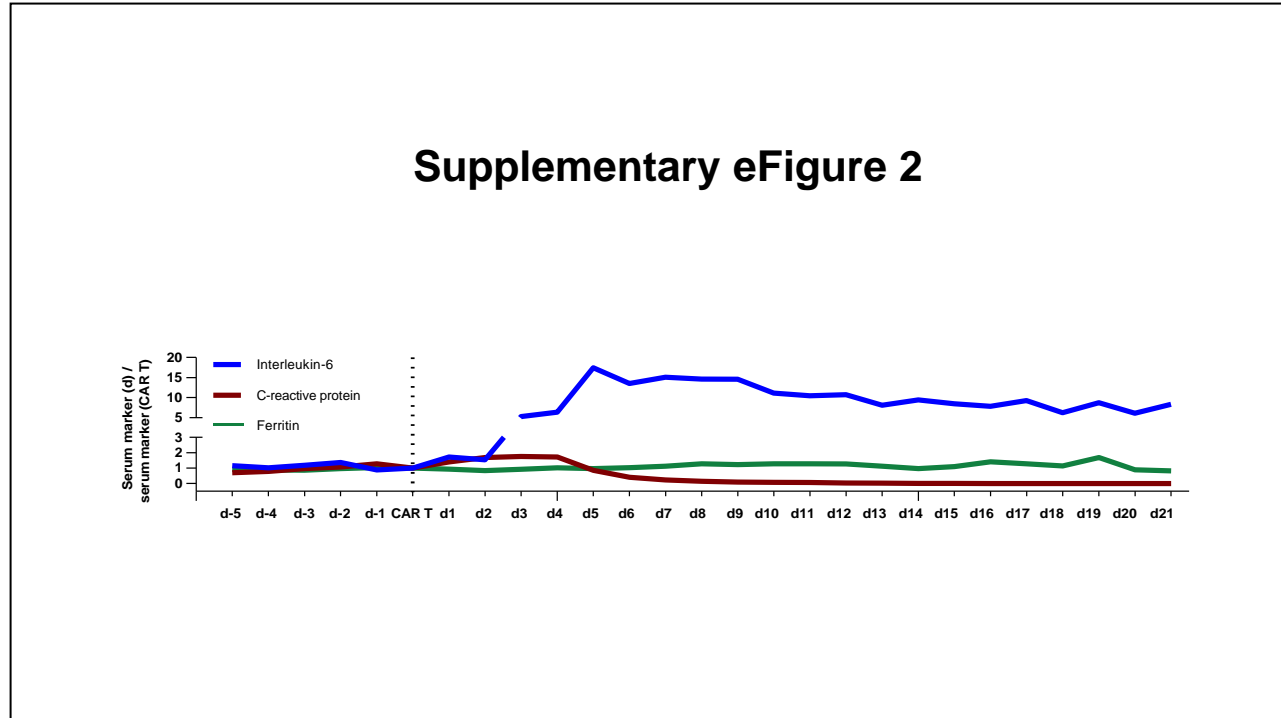**Supplementary eFigure 1: Database search.**

Search procedure for the institutional database to identify the patients with secondary CNS lymphoma (n = 10) included in the present study.

Supplementary eFigure 1

Institutional database including **all patients treated with CAR T-cells** at the Department of Medicine, University Hospital of the Ludwig-Maximilians-University in Munich, Germany

Patients treated with **CAR T-cells for systemic (large B-cell) lymphoma**

Exclusion: patients treated with CAR T-cells for other tumor entities (e.g. leukemia)

Multi-disciplinary review of CNS staging exams (MRI of the neuroaxis, CSF) done 0-28 days prior to CAR T-cell transfusion

Patients with **secondary CNS lymphoma** defined as:

- MRI: solid and/or meningeal lesions consistent with involvement of the CNS
  and / or
- CSF: cytology consistent with meningeosis lymphomatosa

Exclusion: lymphoma patients with no CNS involvement per MRI or CSF

Supplementary eFigure 2: Serum inflammatory biomarkers after CAR T-cell transfusion.

Median ratio of the serum levels of CRP (red line), interleukin-6 (blue), and ferritin (green) in relationship to serum levels at CAR T-cell transfusion.

Supplementary eFigure 2

Supplementary eTable 1: Prior therapies, baseline laboratory findings, toxicities, and quantification of extra-axial involvement.

Characteristics are given for all patients with secondary CNS lymphoma (n = 10) treated with CD19-directed CAR T-cells. Baseline clinical performance status, co-stimulatory domains of the used CAR T-cell product, baseline laboratory findings, toxicities, and quantification of extra-axial involvement are given. Bridging therapy was defined as any therapy received within 6 weeks prior to CAR T-cell infusion.

Abbreviations: CD – cluster of differentiation. CRP – C-reactive protein. CRS – cytokine release syndrome. ICANS – immune effector cell-associated neurotoxicity syndrome. ICU – intensive care unit. KPS – Karnofsky performance score. LDH – lactate dehydrogenase. Pembro – pembrolizumab. Pola – polatuzumab. R – rituximab. RT – radiotherapy. 4-1BB: tumor necrosis factor superfamily member 9. '-' - not available for review.

				Baseline laboratory findings			Toxicitiy profile					Extra-axial involvement
#	KPS / ECOG	Co-stimulatory domain	Prior therapy lines (incl. CNS-directed + bridging therapy)	LDH (U/L)	CRP (mg/dL)	Ferritin (µg/L)	Maximal CRS grade	Maximal ICANS grade	Tocilizuamb (doses)	Steroids (days)	ICU admission	Systemic tumor volume quantification (mL)
1	90 / 0	CD28z	4x R-CHOP / 2x R-DHAP + 1x R-Dexa / 1x R-Dexa-BEAM / 1x R-Dexa-CHOP/ **1x R-Dexa-Pola-Benda**	170	4.5	2878	1	0	yes (4)	no	no	258
2	90 / 1	4-1BB	6x R-CHO(E)P + 2x R / 4 x R-MTX + i.th. triple / 2x Ara-C/Thiotepa + i.th. triple / local RT (L2-3) with 30 Gy / **2x R-Pola-Benda**	290	0.8	1547	1	0	yes (4)	no	no	4
3	70 / 2	4-1BB	6x R-CHOP / 2x HD-MTX / Emergent-RT 30 Gy (lumbar) / 2x R-AraC/Thiotepa / 1x R-MTX / **RT 40 Gy (cerebral) + Dexa**	319	1.4	843	1	0	yes (4)	no	no	20
4	90 / 0	4-1BB	3x R-MTX-Ifosfamide / 6x MTX, R-Ara-C, Procarbazine / High-dose CTX + i.th. CTX + ASCT (MATRIX protocol) / 4x R-MTX / RT left cerebral w/ 30 Gy + Lenalidomid /RT (40 Gy cerebral) + Ibrutinib / 6x R-CHOP / **1x R-Pola-Benda**	207	0.9	455	2	0	yes (4)	no	no	1
5	90 / 0	4-1BB	6x R-CHOP + 2x R / High-dose CTX + i.th. CTX + ASCT (MATRIX protocol) / **2x R-MTX + i.th. CTX**	179	0.2	1434	2	2	yes (4)	yes (1)	no	0
6	60 / 2	4-1BB	2x CHOP-miniCHOP / 6x Gem-Ox / 2x Cytarabine/Thiotepa (Freiburg Protocol) / Nivolumab / Local RT (cerebral) / **Nivolumab + RT mediastinal (20 Gy) + Dexa**	740	1.5	2283	2	2	yes (4)	no	no	474
7	60 / 2	4-1BB	1x R-miniCHOP / EBV-specific T cells / 5x Daratumumab-miniCHOP / 3x R-Pola / local RT left knee (30 Gy) / **2x (Dara)-Vindesin-Dexa**	947	4.3	8835	2	2	yes (2)	yes (5)	no	730
8	70 / 1	4-1BB	6x R-CHOEP / 2x R-DHAP + HD-BEAM + ASCT / Emergent RT + 1x HD-MTX / CTX + i.th. CTX (MATRIX protocol) / RT cerebral 23 x 2Gy / 2x R-Lenalidomide / **Emergent RT (spinal, 30 Gy) + operative decompression + Dexa**	623	3.4	3358	1	3	yes (1)	yes (21)	no	0
9	90 / 0	CD28z	3x R-CHOP / 2x R-MTX / 2x R-DHAP + HD-BEAM +ASCT / **R-HYPER-CVAD (BLOCK A)**	143	0.2	1556	2	3	yes (2)	yes (18)	yes	-
10	70 / 1	4-1BB	7x R-CHOP / 1x R-MTX + 2x i.th. CTX / 2x R-DHAP / R-Dexa-BEAM / **1x R-Dexa-Cyclo + 2 x R-Pola-Benda + i.th. CTX**	381	22.5	>8000	3	4	yes (4)	yes (7); early death	yes	434
Total	80 / 1 (med.)	8/10 4-1BB	5.5 (4 – 7) / 2 (1 – 4) (median)	305 (median)	1.5 (median)	1920 (median)	1 (median)	2 (median)	10/10 yes	5/10 yes	2/10 yes	20 (median)