Table S1: Summary table demonstrating observed updates and modifications in therapy-specific Criteria applied since Lugano classification
[1]PET: Positron emission tomography; [2]CT: Computed tomography; [3]FDG: Fluorodeoxyglucose; [4]DS: Deauville score; [5]SPD: Sum of perpendicular diameters; [6]N/A: Not Applicable; [7]IR: Indeterminate response; [8]LD: Long diameter; [9]SLD: Sum of longest diameters.

Criteria	Complete Response		Partial Response		Stable Disease		Progression		Pseudoprogression	Value	Modifications
	PET[1]	CT[2]	PET	CT	PET	CT	PET	CT			
Lugano	FDG[3] uptake normalization DS= 1-3.	Reduction of all involved lesion to normal size	FDG uptake Reduction DS[4] = 4-5	≥ 50% reduction in SPD[5] of up to 6 target lesions	Stable FDG uptake	No interval change	- Metabolic progression with DS= 4-5 - New FDG-avid lesions	- ≥ 50% increase in SPD of lesions - New lesion(s)	Not account for	Widely used	N/A[6]
LYRIC	FDG uptake normalization DS= 1-3.	Reduction of all involved lesion to normal size	FDG uptake Reduction DS= 4-5	≥ 50% reduction in SPD of up to 6 target lesions	Stable FDG uptake	No interval change	Labelled IR[7]: - IR(1): >50% increase in SPD in first 12 weeks -IR(2): >50% increase in SPD with emergence of new lesion(s), or >50% increase in PPD of a lesion or set of lesions at any time during treatment -IR(3): Increase in FDG uptake without a concomitant increase in lesion size meeting criteria for PD		Diagnosed retrospectively after achieving metabolic response following initial DP.	Accounting for pseudoprogression	Adding IR category to account for pseudoprogression
RECIL	FDG uptake normalization DS= 1-3.	Complete resolution of all target lesions and all nodes with LD[8] < 1 cm	FDG uptake Reduction DS= 4-5	≥ 30% decrease in SLD[9] of target lesions.	Any DS	Decrease < 10% to increase ≤ 20% in target lesions	Any DS	> 20% increase in SLD	Same as LYRIC	Accounting for pseudoprogression	- Adding new category under the name of (Minor Response) associated with reduction in SLD between ≥ 10% and < 30%. -Progressive and minor response do not require correlation with Deauville criteria - Using Uni-dimensional, longest diameter of any target lesion to measure tumor burden

Table S2: Summary table demonstrating previous observations from the utilization of immune checkpoint inhibitors in lymphoma

Author/	Year of publication	No. of patients	Median follow-up	Lymphoma type	Therapy regimen	Purpose	Observation
Ansell et al. [72]	2015	23	40 weeks	R/R HL	Nivolumab	Safety and efficacy	Safety and efficacy established
Armand et al. [73]	2016	31	18 months	R/R HL	Pembroluzimab	Safety and efficacy	Safety and efficacy established
Younes et al. [75]	2016	80	9 months	R/R HL	Nivolumab	Safety and efficacy	Safety and efficacy established
Chen et al. [74]	2017	210	10 months	R/R HL	Pembroluzimab	Safety and efficacy	Safety and efficacy established
Ansell et al. [112]	2019	121	9 months	R/R DLBCL	Nivolumab	Safety and efficacy	Safety established with suboptimal response rates
Younes et al. [123]	2019	42	21 months	Untreated DLBCL	Atezolizumab + R-CHOP	Safety and efficacy	Encouraging results obtained
Smith et al. [122]	2020	30	26 months	Untreated DLBCL	Pembroluzimab + R-CHOP	Efficacy and survival	Excellent response and survival outcomes
Dercle et al. [76]	2018	16	23 months	R/R HL	Pembrolizumab or nivolumab	Response assessment through the use of Lugano/LYRIC Criteria	Unique immunotherapy patterns observed in 31% of case
Castello et al. [59]	2019	43	19 months	R/R HL	Pembrolizumab or nivolumab	FDG PET/CT role in therapy response assessment through the use of Lugano/LYRIC Criteria + PET parameters	Early FDG PET/CT reliability in response assessment is established
Park et al. [83]	2022	83	22 months	Limited stage HL	Nivolumab following BV-AVD	Efficacy and survival	Favorable safety and clinical outcomes of BV-AVD induction followed by Nivolumab consolidation in limited stage HL

Table S3: Summary table demonstrating previous observations from the utilization of CAR-T in Non-Hodgkin's Lymphoma.

Author/	Year of publication	No. of patients	Median follow-up	Lymphoma type	Purpose	Observation
Shah et al. [124]	2018	7	11.5 months	NHL	FDG PET/CT role in therapy response assessment	MTV predicitve value is observed
Cohen et al. [125]	2022	48	12.8 months	DLBCL	FDG PET/CT role in therapy response assessment through the use of PET parameters	DS and ΔSUVmax can help identify treatment failure at TD interval
Galtier et al. [126]	2022	160	12.6 months	R/R LBCL	FDG PET/CT role in therapy response assessment	High predictive value for both 5 PS and MTV have been observed
Kuhnl et al. [127]	2022	171	14.5	R/R LBCL	FDG PET/CT role in therapy response assessment	Early PET/CT response can predict CAR-T failure in LBCL
Breen et al. [128]	2022	69	13.3	R/R LBCL	Prognostic role of FDG PET/CT	SUVmax threshold of 10 can provide prognostic feedback
Al Zaki et al. [129]	2022	206	12	R/R LBCL	Prognostic role of FDG PET/CT	SUVmax threshold of 10 at M1 can provide prognostic feedback
Wang et al. [130]	2019	19	5	R/R NHL	FDG PET/CT role in assessment of CAR-T related side effects	High tumor burden observed by PET/CT was related
Bailly et al. [131]	2022	40	5.4	NHL	Prognostic role of FDG PET/CT	PET/CT observed more events in patients with inadeuqate lymphodepletion prior to CAR-T transfusion considering the benefitial effects of providing adequate disease control prior to therapy.