

**2019 ACR Provisional Criteria for Clinically Relevant Improvement in Children and Adolescents With Childhood-Onset Systemic Lupus Erythematosus**

**Supplemental Table 1: Step 2 Patient Profiles by adjudication rule in training-dataset†**

		<i>No Change</i>	<i>Minor</i>	<i>Moderate</i>	<i>Major</i>	<b>Total</b>
<b>Majority Rule</b>	<i>No CRI<sub>cSLE</sub></i>	65	29	1	0	95
		68.42%	30.53%	1.05%	0.00%	100.00%
	<i>Yes CRI<sub>cSLE</sub></i>	0	18	39	48	105
		0.00%	17.14%	37.14%	45.71%	100.00%
<b>67%</b>	<i>No CRI</i>	38	0	0	0	38
		100.00%	0.00%	0.00%	0.00%	100.00%
	<i>Yes CRI</i>	0	0	1	25	26
		0.00%	0.00%	3.85%	96.15%	100.00%

† values are *n* (% of 200);

**\*\*fewer than 4 PP-raters agreed at a 67% level about the course of cSLE between baseline and follow-up.**

**Supplemental table 2: Performance of the ACR/PRINTO Criteria for cSLE Improvement as published by Ruperto et al 2006 – 67% Rule†**

Reference standard (vs. no change)	PCI	Trainings-dataset (N=200)			Validation-dataset (N=233)		
		Sensitivity	Specificity	Kappa ± SE*	Sensitivity	Specificity	Kappa ± SE*
CRI <sub>cSLE</sub>	2/5 by ≥40% and no more than 1 worse by > 30% (DI08)	90.3%	43.1%	0.36 ± 0.07	87.7%	53.1%	0.43 ± 0.07
	2/5 by ≥40% and no more than 1 worse by > 30% DI17	90.3%	43.1%	0.36 ± 0.07	87.7%	53.1%	0.43 ± 0.07
	3/5 by ≥30% and no more than 2 worse by > 30% (DI12)	100.0%	12.3%	0.14 ± 0.05	97.5%	17.2%	0.18 ± 0.06
At least minor improvement	2/5 by ≥50% and no more than 1 worse by > 30% (DI11)	90.3%	56.4%	0.45 ± 0.10	89.5%	55.1%	0.34 ± 0.09
	2/5 by ≥40% and no more than 1 worse by > 30% (DI08)	90.3%	56.4%	0.45 ± 0.10	89.5%	55.1%	0.34 ± 0.09
	2/5 by ≥40% and no more than 1 worse by > 30% DI17	90.3%	56.4%	0.45 ± 0.10	89.5%	55.1%	0.34 ± 0.09
	3/5 by ≥30% and no more than 2 worse by > 30% (DI12)	100.0%	15.4%	0.14 ± 0.06	100.0%	20.4%	0.13 ± 0.04
At least moderate improvement	2/5 by ≥50% and no more than 1 worse by > 30% (DI11)	92.3%	52.3%	0.39 ± 0.09	89.5%	55.1%	0.34 ± 0.09
	2/5 by ≥40% and no more than 1 worse by > 30% (DI08)	92.3%	52.3%	0.39 ± 0.09	89.5%	55.1%	0.34 ± 0.09
	2/5 by ≥40% and no more than 1 worse by > 30% DI17	92.3%	52.3%	0.39 ± 0.09	89.5%	55.1%	0.34 ± 0.09
	3/5 by ≥30% and no more than 2 worse by > 30% (DI12)	100.0%	13.6%	0.10 ± 0.04	100.0%	20.4%	0.13 ± 0.04
Major Improvement	2/5 by ≥50% and no more than 1 worse by > 30% (DI11)	92.0%	51.1%	0.37 ± 0.09	88.9%	54.0%	0.31 ± 0.09
	2/5 by ≥40% and no more than 1 worse by > 30% (DI08)	92.0%	51.1%	0.37 ± 0.09	88.9%	54.0%	0.31 ± 0.09
	2/5 by ≥40% and no more than 1 worse by > 30% DI17	92.0%	51.1%	0.37 ± 0.09	88.9%	54.0%	0.31 ± 0.09
	3/5 by ≥30% and no more than 2 worse by > 30% (DI12)	100.0%	13.3%	0.10 ± 0.04	100.0%	20.0%	0.12 ± 0.04

\* kappa provides agreement between PCI and PP ratings from Step 4

† Ruperto N, Ravelli A, Oliveira S, et al. The Pediatric Rheumatology International Trials Organization/American College of Rheumatology provisional criteria for the evaluation of response to therapy in juvenile systemic lupus erythematosus: prospective validation of the definition of improvement. *Arthritis Rheum.* 2006;55(3):355-363.

**Supplemental Table 3a: Changes in the core response variables with various levels of cSLE improvement considering either absolute as compared to relative (percentage) changes between baseline and follow-up in the training-dataset†**

Method of Change	cSLE-CRV‡	Level of Improvement				P-value		
		(1) No Change	(2) Minor	(3) Moderate	(4) Major	(1) vs.(2)	(2) vs. (3)	(3) vs. (4)
Absolute difference	<i>UPCR</i>	-0.17 ± 0.21	-0.29 ± 0.24	-0.85 ± 0.27	-1.75 ± 0.24	0.981	0.403	0.065
	<i>SLEDAI</i>	-2.14 ± 0.53	-5.00 ± 0.62	-9.28 ± 0.67	-18.29 ± 0.62	0.003	0.000	0.000
	<i>MD-global</i>	-0.11 ± 0.21	-1.94 ± 0.25	-3.40 ± 0.27	-5.65 ± 0.25	0.000	0.001	0.000
	<i>Patient global</i>	0.37 ± 0.36	-1.35 ± 0.43	-2.14 ± 0.46	-3.83 ± 0.42	0.013	0.600	0.036
	<i>CHQ-PHS</i>	-0.09 ± 1.51	7.40 ± 1.78	10.23 ± 1.93	20.15 ± 1.76	0.008	0.702	0.001
Percentage difference	<i>UPCR</i>	0.60 ± 0.36	0.11 ± 0.43	-0.44 ± 0.46	-0.55 ± 0.42	0.818	0.815	0.998
	<i>SLEDAI</i>	-0.20 ± 0.04	-0.41 ± 0.04	-0.66 ± 0.05	-0.83 ± 0.04	0.003	0.001	0.049
	<i>MD-global</i>	0.01 ± 0.03	-0.38 ± 0.04	-0.58 ± 0.04	-0.73 ± 0.04	0.000	0.005	0.058
	<i>Patient global</i>	0.51 ± 0.15	-0.20 ± 0.18	-0.25 ± 0.19	-0.38 ± 0.17	0.012	0.998	0.955
	<i>CHQ-PHS</i>	0.11 ± 0.34	0.38 ± 0.40	1.38 ± 0.43	2.02 ± 0.39	0.954	0.329	0.689

† Values are mean and standard errors

‡ UPCR: urine protein to creatinine ratio from random urine sample; SLEDAI: SLE disease activity summary score; MD-global: physician global assessment of cSLE activity; Patient-global: patient assessment of overall well-being; CHQ-PHS Child Health Questionnaire, P50 version Physical function summary score

**Supplemental Table 3b: Changes in the core response variables by improvement level in the validation-dataset from Majority Rule**

Method of Change	CRV	Any Improvement				At least Moderate Improvement				Major Improvement`			
		AUC	Sensitivity	Specificity	Threshold score]†	AUC	Sensitivity	Specificity	Threshold score	AUC	Sensitivity	Specificity	Threshold score
Absolute difference	<i>UPCR</i>	0.67	70%	58 %	-0.03	0.69	81%	48%	-0.02	0.69	44%	88%	-0.92
	<i>SLEDAI</i>	0.89	88%	80%	-4.00	0.94	93%	82%	-7.00	0.97	92%	88%	-11
	<i>MD-global</i>	0.92	87%	82%	-1.00	0.92	85%	82%	-2.40	0.92	90%	80%	-3.40
	<i>Patient global</i>	0.77	69%	80%	-0.30	0.74	73%	73%	-0.80	0.76	79%	72%	-1.20
	<i>CHQ-PHS</i>	0.78	59%	91%	6.56	0.76	71%	73%	5.15	0.81	79%	72%	7.91
Percentage difference	<i>UPCR</i>	0.67	62%	71%	-0.34	0.73	72%	71%	-0.40	0.72	65%	76%	-0.60
	<i>SLEDAI</i>	0.84	70%	92%	-0.52	0.90	91%	83%	-0.52	0.91	94%	75%	-0.65
	<i>MD-global</i>	0.91	86%	80%	-0.31	0.91	85%	85%	-0.53	0.90	94%	72%	-0.54
	<i>Patient global</i>	0.77	64%	85%	-0.23	0.75	74%	72%	-0.25	0.77	71%	79%	-0.54
	<i>CHQ-PHS</i>	0.76	59%	91%	0.16	0.75	67%	77%	0.16	0.81	68%	84%	0.42

† Values are mean and SD; AUC: area under the receiver operating characteristic curve in %; \* sensitivity and specificity at the threshold score  
 ‡ UPCR: urine protein to creatinine ratio from random urine sample; SLEDAI: SLE disease activity summary score; MD-global: physician global assessment of cSLE activity; Patient-global: patient assessment of overall well-being; CHQ-PHS Child Health Questionnaire, P50 version Physical function summary score

] Optimal score from univariate logistic regression to discriminate between the presence vs. absence of CRIC<sub>5</sub>