Scenarios were identified using the top 13 organ involvement combinations, then patients were grouped into 7 categories based on GC dose and 10 patients per category were selected. Scenario information included: SLEDAI-2K score, organ involvement combination and GC dose.

3 rheumatologists ranked disease activity with PGA. An independent cohort was used for the validation in phase 3. We hypothesised that in patients with improvement/worsening by SLEDAI-2K, the change in SLEDAI-2K and SGI will correlate.

**Results** Scenario development was summarised in Table 1. 131 scenarios were ranked by 3 rheumatologists leading to 393 records. Perfect LS agreement was achieved; ICC (2, k) of 0.89 (95% CI: 0.83, 0.89). A quadratic linear regression model relating GC and SLEDAI-2K was structured; SGI score=SLEDAI-2K + [3.65+0.29*GC–0.0027(GC²*GC)]. The weight score of GC doses was derived (Table 2). Construct Validity: 109 of the 158 patients improved, 38 remained unchanged, 11 worsened. SLEDAI-2K and SGI correlated highly (r=0.87) and changed in the same direction in patients with improvement/worsening proving the validity of SGI.

**Conclusions** We developed and validated a novel lupus disease activity index, SGI, that describes disease activity while accounting for GC dose.

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**Validation of a novel definition of low disease activity state in systemic lupus erythematosus**

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**Abstract:**

Background and aims While a “Treat-to-target” principle is widely advocated in management of systemic lupus erythematosus (SLE), there is currently no internationally agreed definition of low disease activity in lupus. In 2015, the Asia-Pacific Lupus Collaboration presented a novel consensus definition of a safe state in lupus, the “Lupus Low Disease Activity State” (LLDAS). Aims: 1) to develop a novel lupus low disease activity state metric, and 2) to validate this model in a prospective study. Methods This was a prospective study to determine whether LLDAS predicted lower flare-ups, damage and mortality. 339 SLE patients were recruited and followed for 30 months. Multivariable binomial regression was used to determine factors associated with LLDAS and Cox proportional hazard model to determine whether prior higher% of days in LLDAS would be associated with lower future flare-ups.

**Results** Mean patient age was 48.1 years and mean disease duration 19.6 years. Female to male ratio=16 to 1. 79 flare-ups were documented. 92.6% of patients had ever achieved LLDAS during the study period and 62.1% of patient-days were in LLDAS. No major demographic or prior disease presentations were found to be associated with the attainment of LLDAS. Patients with prior higher percentage of days in LLDAS had lower hazard of lupus flare-ups (HR=0.420, p=0.015) after adjustment for gender and age. The numbers of patient damage and death were insufficient for analysis.

**Conclusions** LLDAS is an independent construct achievable by most patients of different history or background. Our preliminary study shows LLDAS can predict the risk of future flare-ups though further studies are needed to determine whether it is associated less lupus-related damage and lower mortality.