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## Evaluation of the Reliability of the Cutaneous Dermatomyositis Disease Area and Severity Index (CDASI) and the Cutaneous Assessment Tool Binary Method (CAT-BM) in Juvenile Dermatomyositis Among Pediatric Dermatologists, Rheumatologists, and Neurologists

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### Abstract

**Background**—The Cutaneous Dermatomyositis Disease Area and Severity Index (CDASI) and Cutaneous Assessment Tool-Binary Method (CAT-BM) have been shown to be reliable and valid

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outcome measures to assess cutaneous disease in adult dermatomyositis (DM) and juvenile DM (JDM), respectively.

**Objective**—This study compared the CDASI and CAT-BM for use by pediatric dermatologists, pediatric rheumatologists, and pediatric neurologists in patients with JDM.

**Methods**—Five pediatric dermatologists, five pediatric rheumatologists, and five pediatric neurologists each evaluated 14 patients with JDM using the CDASI, CAT-BM, and skin Physician Global Assessment (PGA) scales. Inter-rater, intra-rater reliability, construct validity, and completion time were compared.

**Results**—Inter-rater reliability for CDASI activity and damage scores was good to moderate for pediatric dermatologists and rheumatologists, but poor for pediatric neurologists. The inter-rater reliability for CAT-BM activity scores was moderate for pediatric dermatologists and rheumatologists, but poor for pediatric neurologists and poor across all specialties for damage scores. Intra-rater reliability for the CDASI and CAT-BM activity and damage scores was moderate to excellent for pediatric dermatologists, rheumatologists, and neurologists. Strong associations were found between skin PGA activity and damage scores and CDASI or CAT-BM activity and damage scores, respectively ( $p < 0.002$ ). The CDASI had a mean completion time of 5.4 minutes versus the CAT-BM of 3.1 minutes.

**Conclusions**—Our data confirm the reliability of the CDASI activity and damage scores and the CAT-BM activity scores when used by pediatric dermatologists and rheumatologists in assessing JDM. Significant variation existed in the pediatric neurologists' scores.

## INTRODUCTION

Dermatomyositis (DM) is an idiopathic inflammatory myopathy characterized by specific cutaneous findings and proximal muscle weakness, along with potential pulmonary, gastrointestinal, cardiac, and ocular involvement [1–2]. Among children, juvenile dermatomyositis (JDM) is the most common idiopathic inflammatory myopathy with an estimated incidence between 2.5 to 4.1 cases per one million [3]. Cutaneous manifestations of JDM precede or accompany the onset of muscle weakness in 76% of cases and are thought to be an important indicator of disease activity [4–6]. Indeed, studies have shown that skin manifestations, rather than muscle, tend to persist over time despite treatment [7–8]. Additionally, current criteria for classifying patients with clinically inactive JDM underestimate the presence of skin activity in this population [9]

Multiple comprehensive instruments exist to assess JDM, including the Disease Assessment Scale (DAS) and the Myositis Disease Activity Assessment Tool. Of these, the DAS has been widely used to assess skin disease in the JDM population. This measure has been shown to have good construct validity and inter-rater reliability, although the skin-specific portion of the DAS demonstrates only moderate responsiveness to change [10–11]. Currently there is only one existing validated tool, the Cutaneous Assessment Tool (CAT), that specifically assesses skin disease in JDM [12–14]. The CAT Binary Method (CAT-BM) was developed as a shortened version of the CAT and dichotomizes the scoring of cutaneous features as present or absent [15]. It has been validated for use in JDM although no comparative studies among specialties other than pediatric rheumatology have been

performed [13–15]. As a result, pediatric dermatologists and pediatric neurologists, who also treat JDM patients and evaluate them in clinical trials, do not commonly use the CAT-BM to assess JDM patients.

In the past ten years, the Cutaneous Dermatomyositis Disease Area and Severity Index (CDASI) has been developed and validated for use in adult DM [16–17]. The CDASI assesses skin activity and damage in fifteen anatomical locations and assigns two scores, 0–100 for activity and 0–32 for damage with higher scores indicating increased disease severity. A previous study has demonstrated that the CDASI has better responsiveness to clinical change when compared to other outcome measures for DM in adult patients, including the CAT-BM [16]. However, it is currently validated for use in adult DM patients only [16–17].

The purpose of the present study is two-fold: first, to compare the abilities of pediatric physicians of various specialties to use the CDASI and CAT-BM in JDM patients; and second, to compare the reliability of the two outcome measures relative to each other in this population.

## METHODS

This study was approved by the University of Pennsylvania Institutional Review Board. Fifteen pediatric physicians and 14 patients with JDM were brought to the Autoimmune Skin Diseases clinic at the University of Pennsylvania on a single day in May 2015. All physicians first completed a 45-minute training session on the assessment of cutaneous DM using three outcome measures, the CDASI, CAT-BM, and skin Physician Global Assessment (PGA). Training modules for the CDASI and the CAT-BM are available online at the respective websites: [http://www.niehs.nih.gov/...s/docs/cdasi\\_training\\_tool.pptx](http://www.niehs.nih.gov/...s/docs/cdasi_training_tool.pptx) and <http://www.niehs.nih.gov/research/resources/imacs/othertools/index.cfm>. The CDASI has previously been published [18], and the CAT-BM is available online at <https://www.niehs.nih.gov/research/resources/imacs/othertools/index.cfm>.

Following the training, physicians individually rated each JDM patient using each measure. Half of the assessments were performed with the CDASI before the CAT-BM, and the other half were performed with the CAT-BM before the CDASI; the skin PGA was assessed last. After completing all 14 assessments, physicians were instructed to re-assess two available patients. At the end of the study activities, each physician completed a brief physician exit survey.

### Physicians

Five pediatric dermatologists, five pediatric rheumatologists, and five pediatric neurologists participated in this study. Of the dermatologists, four were attending-level, academic-based dermatologists, and one was completing a fellowship in pediatric dermatology. All completed or were in the process of receiving formal sub-specialty training in pediatric dermatology at the time of the study with the exception of one dermatologist, who is a member of the Society for Pediatric Dermatology and an assistant professor of dermatology in pediatrics. Of the rheumatologists, four were attending-level, academic-based pediatric

rheumatologists and one was a pediatric rheumatology fellow. Of the neurologists, two were attending-level, academic-based pediatric neurologists and three were postgraduate fifth year pediatric neurology residents. Physicians were instructed to see patients based on availability with no order pre-assigned.

### **Skin Physician Global Assessment**

The skin PGA is a physician-administered overall rating of skin disease severity. Assessments of skin activity, skin damage, and global skin disease are each made on a 10-cm linear visual analog scale (VAS) ranging from 0 (no evidence of disease) to 10 (extremely severe disease). As the skin PGA is a widely used global reference and benchmark in studies comparing outcome instruments in cutaneous DM, it was chosen to test construct validity in the present study [16–17].

### **Assessment of Intra- and Inter-rater Reliability**

Inter-rater reliability was assessed within each group of specialists. All physicians evaluated 14 patients during the study session, except one physician who evaluated 13 patients. To assess intra-rater reliability, all 14 physicians scored two patients twice. To minimize recall bias, physicians were not informed that they would need to re-assess two patients until they had finished the initial assessment.

### **Statistical Analysis**

Previous studies have shown CDASI and CAT-BM scores to be normally distributed, so normality was assumed for this study [17]. Inter-rater reliability was estimated using the intra-class correlation coefficient (ICC), calculated from random effect ANOVA models with patient-specific random effects [19]. If a patient was assessed twice by the same physician, only the first assessment was included in this analysis. In addition, for each physician group, the physician-specific ICC was estimated using the observations by each group of specialists. Previous studies have determined an ICC between 0.50 to 0.70 as moderate, 0.70 to 0.81 as good, and >0.81 as almost perfect [16–17, 20]. For this study, ICC scores between 0.50 and 0.70 were considered moderate and minimally acceptable, 0.70 to 0.81 good, and >0.81 were considered excellent. Any ICC scores <0.5 were considered poor.

Intra-rater reliability of CDASI and CAT-BM activity and damage was estimated using the ICC, calculated from random effect ANOVA models [19]. The repeated CDASI and CAT-BM assessments from the same patients and same physician were included in the analysis. Two reads of the same patient by the same physician were considered to have the same normal distributions, i.e., physician-patient combinations as random effects.

For the difference between pediatric dermatologists, neurologists, and rheumatologists, the group means were estimated from the fixed effects in the same ANOVA models. The means in neurologists or rheumatologists were compared with the mean in dermatologists using t-tests within the ANOVA models with significance level of 0.025 (after adjusting for the number of comparisons). The time spent using the CDASI was summarized within each group of physicians and the differences from the dermatologists were tested using the

Dunnett's comparison in ANOVA. Only the first assessment from a physician on a patient was included in the analysis.

Construct validity was assessed by comparing the change in skin PGA activity to the per unit change in the CDASI and the CAT-BM activity scores and by comparing the change in skin PGA damage to the per unit change in the CDASI and the CAT-BM damage scores.

P values < 0.05 were considered statistically significant for all analyses. The statistical analysis was carried out using R2.15.3.

## RESULTS

### Patients

Characteristics of the patient population are summarized in Table 1.

### Skin Assessment Scores Among Specialists

The mean skin assessment scores for the JDM patients are presented in Table 2. There was no difference between the mean CDASI activity scores of pediatric dermatologists and rheumatologists, although there was a significant difference between the pediatric dermatologists and neurologists. The mean CDASI damage scores differed between pediatric dermatologists and neurologists but not between pediatric dermatologists and rheumatologists.

As with the CDASI activity scores, there was a significant difference in the mean CAT-BM activity scores between pediatric dermatologists and neurologists but not between pediatric dermatologists and rheumatologists. Mean CAT-BM damage scores differed between pediatric dermatologists and neurologists and also between pediatric dermatologists and rheumatologists.

There was no difference in mean skin PGA activity or damage scores between dermatologist and rheumatologists or between dermatologists and neurologists.

Twelve of 14 patients had mild activity, defined as a CDASI activity score equal to or less than 14 [21]. The standard deviations of CDASI activity scores of patients with moderate to severe activity were not appreciably greater than the standard deviations of CDASI activity scores of patients with mild activity, suggesting that variance was not greater in patients with greater activity.

### Inter-rater Reliability

The CDASI was found to have moderate inter-rater reliability in activity scores among pediatric dermatologists, good inter-rater reliability among pediatric rheumatologists, and poor inter-rater reliability among pediatric neurologists (Table 3). CDASI damage scores had moderate inter-rater reliability among pediatric dermatologists and rheumatologists and poor inter-rater reliability among pediatric neurologists.

The CAT-BM activity scores had moderate inter-rater reliability among pediatric dermatologists and rheumatologists but poor inter-rater reliability among pediatric neurologists. The CAT-BM was found to have poor inter-rater reliability in damage scores across all three specialties.

The skin PGA activity scores had moderate inter-rater reliability among pediatric dermatologists, but poor inter-rater reliability among pediatric rheumatologists and neurologists. Skin PGA damage scores had good inter-rater reliability among pediatric dermatologists and neurologists, but poor inter-rater reliability among pediatric rheumatologists.

### **Intra-rater Reliability**

Intra-rater reliability was excellent among pediatric dermatologists and rheumatologists for the CDASI activity scores and moderate among pediatric neurologists (Table 4). For CDASI damage, the intra-rater reliability was excellent among pediatric dermatologists, good among pediatric neurologists, and moderate among pediatric rheumatologists.

Intra-rater reliability was excellent across all three specialties for CAT-BM activity scores. Damage scores for the CAT-BM were excellent for pediatric dermatologists and neurologists and good for pediatric rheumatologists.

The skin PGA activity and damage scores had excellent intra-rater reliability among pediatric dermatologists and neurologists, but only moderate intra-rater reliability among pediatric rheumatologists.

### **Outliers**

Two outliers were noted. One pediatric neurologist consistently scored patients outside the group mean of pediatric neurologists, and one JDM patient yielded scores that showed more variation than other patients. When these two individuals were removed, the pediatric neurologists' inter-observer ICC for CDASI activity and damage scores improved from poor to moderate (ICC 0.66 and 0.61, respectively). The pediatric rheumatologists' inter-observer ICC for CDASI activity also improved from good to excellent (ICC 0.83). Although pediatric dermatologists' inter-observer ICC for CDASI activity and damage scores stayed within the same moderate category, their activity and damage inter-observer ICC scores for the CDASI also improved to ICC 0.68 and 0.63, respectively. Scores otherwise showed little change.

### **Construct Validity**

There were positive associations between the skin PGA activity and corresponding CDASI and CAT-BM activity scores as well as between the skin PGA damage and corresponding CDASI and CAT-BM damage scores. After adjusting for within-patient correlation and physician's difference, the CDASI activity score increased 0.224 ( $p < 0.001$ ) and the CAT-BM activity score increased 0.484 ( $p < 0.001$ ) for each unit increase in skin PGA activity. For each unit increase in skin PGA damage, the CDASI damage score increased 0.343 ( $p < 0.001$ ) and the CAT-BM damage score increased 0.256 ( $p = 0.002$ ).

### Physician Exit Questionnaire

When asked how comfortable they felt using the CDASI on a scale of 1–5 (1=not comfortable at all, 5=very comfortable), physicians responded with a mean score of 3.8 among pediatric dermatologists, 3.8 among pediatric rheumatologists, and 3.2 among pediatric neurologists. When asked how comfortable they felt using the CAT-BM on the same scale, physicians responded with a mean score of 3.6 among pediatric dermatologists, 3.8 among pediatric rheumatologists, and 3.2 among pediatric neurologists.

### Completion Time

The CDASI had a mean completion time of 5.4 minutes, with pediatric dermatologists averaging  $5.2 \pm 2.8$  minutes (mean  $\pm$  S.D.), pediatric rheumatologists averaging  $4.5 \pm 1.4$  minutes, and pediatric neurologists averaging  $6.5 \pm 3.8$  minutes. The CAT-BM had a mean completion time of 3.1 minutes, with pediatric dermatologists averaging  $2.6 \pm 1.7$  minutes, pediatric rheumatologists averaging  $2.5 \pm 1.2$  minutes, and pediatric neurologists averaging  $4.1 \pm 3.1$  minutes.

## DISCUSSION

The CDASI was developed in order to provide an objective and reproducible outcome instrument to assess cutaneous manifestations of DM for use in clinical trials [16–17]. Validation studies of the CDASI have established its face, content, and construct validities, and comparisons of the CDASI to other outcome instruments including the CAT have consistently demonstrated the superiority of the CDASI in inter- and intra-observer reliability in studies with adult DM patients [16–17]. Most recently, the CDASI has been shown to yield good responsiveness, a key component of a valid outcome measure [21]. These studies have demonstrated the validity of the CDASI when used by dermatologists in the adult DM population.

Development of the CAT-BM, an outcome measure designed for the JDM population, occurred with similar goals as the CDASI [13–15]. Initial validation studies in the JDM population by pediatric rheumatologists demonstrated good construct validity and internal consistency [13–15], and subsequent studies in the adult DM population have confirmed its good construct and content validity along with moderate intra-rater reliability and responsiveness in the adult DM population [16]. Most recently, a study examining the CAT-BM in 71 JDM patients found the CAT-BM to have poorer correlation with the VAS compared to the DAS and poorer responsiveness than both the VAS and DAS [11]. Previous work in the adult DM population, however, has shown that the CDASI demonstrates better responsiveness than either the VAS or CAT-BM [16]. A comparative study of the CDASI and the CAT-BM in the JDM population has not yet been performed. The present study examines the reliability and validity of the CDASI and the CAT-BM in the JDM population when used by pediatric dermatologists, rheumatologists, and neurologists.

Among pediatric dermatologists and rheumatologists, the inter-rater reliability of the CDASI activity and damage scores ranged from moderate to very good. Similarly, the inter-rater reliability of CAT-BM activity scores was moderate among these specialists, although



damage scores were poor. Intra-rater reliability for both the CDASI and CAT-BM was generally excellent, and both demonstrated good construct validity. Mean scores between pediatric dermatologists and rheumatologists were generally similar for the CDASI and CAT-BM, and both outcome instruments were found to have comparable and short completion times. These findings support the use of the CDASI and CAT-BM to assess skin activity in JDM patients when used by pediatric dermatologists and rheumatologists.

Of all the specialties involved in the study, the pediatric neurologists had the most difficulty with the outcome measures. Inter-rater reliability among pediatric neurologists was poor in the activity and damage scores of both the CAT-BM and the CDASI. The removal of the outlier pediatric neurologist improved the inter-rater reliability ICC for the CDASI activity and damage scores to moderate, although the presence of the outlier suggests that there is significant variation in the performance of the pediatric neurologists when using the CDASI. The group of neurologists included a greater number of trainees than the other specialty groups; however, the outlier neurologist was an attending pediatric neuromuscular specialist, suggesting that trainee level did not affect performance. On the physician exit questionnaire, all five pediatric neurologists indicated that they felt they did not have enough training in assessing skin disease. The appropriate attribution of skin lesions remains a potential issue when using either the CDASI or the CAT-BM, and given that pediatric neurologists receive little training in assessing skin disease, this may present a challenge to pediatric neurologists when using the CDASI and/or CAT-BM in clinical research studies and trials.

Regardless of specialty, all of the participating physicians indicated on the exit questionnaire that they felt on average only somewhat comfortable when using either the CDASI or the CAT-BM. In particular, unclear terminology on the CAT-BM seemed to present an issue, while both instruments suffered from unclear scoring instructions, according to responses from the physician exit questionnaire. Given these responses, and the limited preparation prior to using the instruments, physicians who are expected to use the instruments would likely benefit from more extensive training before using either instrument.

We suggest that physicians with regular exposure to JDM are perhaps best suited to using these instruments. Pediatric rheumatologists outperformed all other specialties in the activity scores of both the CDASI and the CAT-BM. With the removal of one outlier patient, their inter-observer ICC for the CDASI activity score reached 0.83, considered to be excellent. Although one of the pediatric rheumatologists was involved in the development of the CAT-BM, none of the other physicians who performed assessments were involved in developing either instrument, suggesting that the pediatric rheumatologists' performance should not be attributed to prior experience with the instruments. We speculate that these results may be due to the reality that JDM patients often receive primary management of their disease from pediatric rheumatologists as opposed to other specialists. However, any physician with sufficient experience in JDM is likely to use these outcome instruments adequately.

Limitations of the study include the relatively mild skin activity of the patients, which may underestimate the reliability of these outcome instruments. This study also did not include an evaluation of the DAS, which has recently demonstrated superior correlation with skin



VAS than the CAT-BM, although with poorer responsiveness [11]. A direct comparison of the CDASI and DAS in the JDM population would be an informative future study.

In conclusion, the CDASI activity and damage scores demonstrate moderate to excellent reliability in patients with JDM when assessed by either pediatric rheumatologists or dermatologists. In contrast, the CAT-BM activity scores demonstrate moderate reliability among pediatric rheumatologists and dermatologists, while the CAT-BM damage scores are poor across all specialties. Both outcome measures show good construct validity with skin global activity. Physicians who plan to use these outcome measures may consider receiving formal training in the use of these instruments, but pediatric rheumatologists and dermatologists with experience in JDM may expect to use the CDASI and CAT-BM adequately. Previous studies in adult DM have shown increased responsiveness of the CDASI relative to the CAT-BM, potentially because the binary nature of the CAT-BM makes detection of anything other than complete resolution of skin activity difficult [14,20]. Further studies of responsiveness of both measures applied to JDM patients are needed to determine which outcome instrument, if any, is preferred.

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**What's already known about this topic?**

- The CDASI was developed by dermatologists as a reliable and valid outcome measure to assess cutaneous disease in adult dermatomyositis (DM)
- The CAT-BM was similarly developed by pediatric rheumatologists for use in juvenile DM (JDM)

**What does this study add?**

- This study expands the application of the CDASI activity and damage scores for use in JDM patients when performed by pediatric dermatologists and rheumatologists
- This study also finds that CAT-BM activity scores are reliable when used by pediatric dermatologists and rheumatologists to assess skin findings in JDM patients

**Table 1**

## Characteristics of the JDM patient study population

Number of JDM patients	14
Race, n (%)	
White/Caucasian	12 (85.7%)
African American	1 (7.1%)
Mixed	1 (7.1%)
Hispanic/Latino	1 (7.1%)
Female sex, n (%)	8 (57.1%)
Age in years at study entry, mean (S.D.)	12.6 (5.6)
JDM duration in years, median (IQR)	4.0 (1.1, 7.0)
JDM subtype, n (%)	
Classic	11 (78.6%)
Hypomyopathic	2 (14.3%)
Amyopathic	1 (7.1%)

Abbreviations: JDM: juvenile dermatomyositis, S.D.: standard deviation, IQR: interquartile range

Table 2

Skin assessment scores in JDM patients among specialties

	Pediatric dermatologists (n=5)		Pediatric rheumatologists (n=5)		Pediatric neurologists (n=5)		Overall	
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	p-value*	Mean (S.D.)	p-value*	Mean (S.D.)	Range
CDASI								
Activity	8.6 (5.5)	8.2 (5.4)	11.2 (6.6)	0.612	9.4 (6.0)	<0.001	9.4 (6.0)	0–29
Damage	2.1 (1.9)	2.2 (1.9)	3.4 (2.5)	0.510	2.6 (2.2)	<0.001	2.6 (2.2)	0–11
CAT-BM								
Activity	3.9 (2.1)	3.7 (2.2)	4.8 (2.4)	0.570	4.1 (2.3)	0.003	4.1 (2.3)	0–12
Damage	1.2 (1.2)	1.8 (1.5)	2.4 (1.5)	0.002	1.8 (1.5)	<0.001	1.8 (1.5)	0–5
Skin PGA								
Activity	3.4 (2.3)	3.0 (2.5)	3.2 (2.3)	0.180	3.2 (2.4)	0.613	3.2 (2.4)	0.0–9.3
Damage	2.4 (2.5)	1.8 (1.9)	2.1 (2.0)	0.020	2.1 (2.1)	0.215	2.1 (2.1)	0.0–9.0

\* Mean values by t-tests compared with pediatric dermatologists

Abbreviations: CDASI: Cutaneous Dermatomyositis Disease Area and Severity Index; CAT-BM: Cutaneous Assessment Tool-Binary Method; PGA: Physician Global Assessment

Summary: Dermatologists were the reference standard. There was no difference between pediatric dermatologists and rheumatologists in the CDASI, CAT-BM activity, and skin PGA scores, whereas there was a significant difference across CDASI and CAT-BM scores when evaluated by pediatric neurologists.

**Table 3**

Inter-rater reliability of Skin Assessment Tool Scores in JDM patients among pediatric specialists\*

	Within pediatric dermatologists (n=5)	Within pediatric rheumatologists (n=5)	Within pediatric neurologists (n=5)
CDASI			
Activity	0.52 (0.44–0.61)	0.81 (0.76–0.85)	0.47 (0.39–0.56)
Damage	0.59 (0.51–0.67)	0.59 (0.51–0.66)	0.46 (0.37–0.54)
CAT-BM			
Activity	0.58 (0.50–0.66)	0.67 (0.60–0.74)	0.42 (0.33–0.51)
Damage	0.49 (0.41–0.58)	0.48 (0.39–0.57)	0.29 (0.20–0.38)
Skin PGA			
Activity	0.64 (0.50–0.78)	0.47 (0.39–0.56)	0.38 (0.29–0.47)
Damage	0.71 (0.65–0.83)	0.31 (0.22–0.40)	0.73 (0.67–0.79)

\* Intra-class correlation coefficients (95% C.I.)

Abbreviations: CDASI: Cutaneous Dermatomyositis Disease Area and Severity Index; CAT-BM: Cutaneous Assessment Tool-Binary Method; PGA: Physician Global Assessment

Summary: The inter-rater agreement was moderate to good for pediatric rheumatologists and dermatologists using the CDASI and CAT-BM activity scores whereas the inter-rater agreement was poor for pediatric neurologists using the same scores.

**Table 4**

Intra-rater reliability of Skin Assessment Tool Scores in JDM patients among pediatric specialists\*

	Within pediatric dermatologists (n=5)	Within pediatric rheumatologists (n=5)	Within pediatric neurologists (n=5)
CDASI			
Activity	0.90 (0.78–1.00)	0.91 (0.79–1.00)	0.65 (0.29–1.00)
Damage	0.97 (0.94–1.00)	0.64 (0.27–1.00)	0.78 (0.53–1.00)
CAT-BM			
Activity	0.86 (0.70–1.00)	0.88 (0.74–1.00)	0.91 (0.80–1.00)
Damage	0.93 (0.85–1.00)	0.73 (0.44–1.00)	0.89 (0.76–1.00)
Skin PGA			
Activity	0.95 (0.90–1.00)	0.50 (0.03–0.96)	0.83 (0.64–1.00)
Damage	0.84 (0.66–1.00)	0.55 (0.12–0.98)	0.96 (0.91–1.00)

\* Intra-class correlation coefficients (95% C.I.)

Abbreviations: CDASI: Cutaneous Dermatomyositis Disease Area and Severity Index; CAT-BM: Cutaneous Assessment Tool-Binary Method; PGA: Physician Global Assessment

Summary: The intra-rater agreement was excellent for pediatric dermatologists using the CDASI and CAT-BM measures, and the intra-rater agreement was good to excellent for pediatric rheumatologists and neurologists using the same outcome instruments.