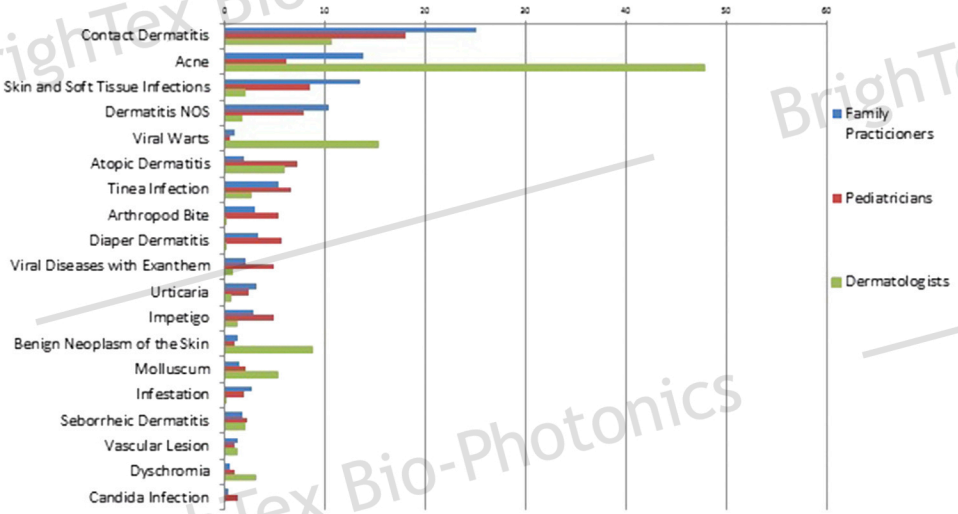

Fig 1. Percentage of patients with each diagnosis as a proportion of all pediatric patients with a dermatology diagnosis as seen by various specialties. *NOS*, Not otherwise specified.

for trainees and health care providers based on the most common dermatologic diagnoses we identified could help alleviate the pediatric dermatology workforce shortage and improve quality of care for many children.

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Objective volumetric grading of postacne scarring

To the Editor: Postacne scarring afflicts up to 95% of individuals with inflammatory acne.[1] Scars range in morphology from altered pigmentation to atrophic or hypertrophic changes in facial topography. Based on the variety of scar subtypes, a multitude of treatment options are available. When

Table I. Interclass correlation coefficients for the Goodman quantitative postacne scarring grading system

Rater	Interclass correlation coefficient (95% CI)
Board-certified dermatologists	0.89 (0.66-0.97)
Dermatology residents	0.62 (0.27-0.82)
Medical students	0.46 (0.136-0.695)

CI, Confidence interval.

Fig 1. Examples of high-resolution 3-view facial photography (**A**) and 3-dimensional reconstructed topographic face map (**B**) with the Clarity 3D Research Ti System (BrighTex Bio-Photonics, San Jose, CA).

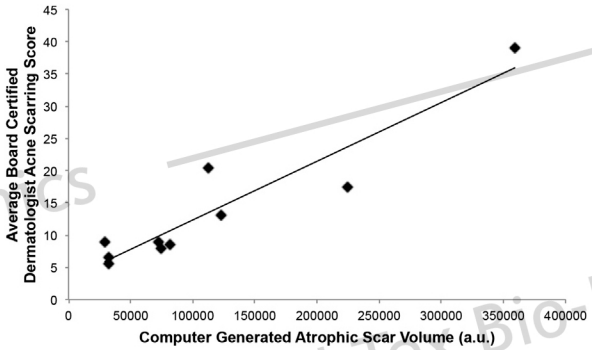

Fig 2. Liner correlation plot of board-certified dermatologists' average Goodman quantitative postacne scar severity score with the computer-generated atrophic scar volume for each patient (N = 10). The Spearman rank order correlation coefficient is 0.76 ($P < .05$). *a.u.*, Arbitrary units.

determining therapeutic approaches, up to 74% of dermatologists agreed that systematic nomenclature is important for acne scar description, yet only 39% were satisfied with the currently available classification systems.[2]

Jacob et al[3] categorized atrophic scars into 3 subtypes (ice pick, boxcar, and rolling) for a simplified subjective standard that encompasses the majority of scar contours. Up to 74% of acne experts reported using the Jacob system.[2] However, the nomenclature for describing individual scars was highly inconsistent among dermatologists, highlighting the subjective nature of descriptive classification systems.[2] Other descriptive acne scarring scales include the Goodman quantitative, Goodman qualitative, and the ECCA (échelle d'évaluation clinique des cicatrices d'acné).[4-6] The Goodman qualitative scale is a 4-point subjective assessment of patient photographs that incorporates 3 scar morphologies and area of involvement. The Goodman quantitative postacne scarring grading system is a photographic assessment that results in a more detailed global severity score ranging from 0 to 84 points. The grading scale is based on scar counts of 5 different morphologies and encompasses the severity of each scar subtype. Although the authors of the scale reported its reproducibility regardless of graders' level of medical training, interrater agreement statistics were not noted.[4]

We evaluated the reproducibility of the Goodman grading system based on high-resolution photographs of patients with a range of postacne scarring. Nine graders underwent a group training session and individually evaluated 10 patient photographs. The University of California—Davis Institutional Review Board approved this research protocol and all patients provided written informed consent.

Our interrater agreeability significantly differed among the graders: "fair" for medical students, "moderate" for dermatology residents, and "good" for board-certified dermatologists (Table I). The results suggest that the Goodman scale's reliability depends on the grader's level of training in dermatology. The study also highlights that even among trained specialists, the subjective system does not reach an "excellent" level of reproducibility. Therefore, a more objective grading system is necessary.

Although there is no single objective validated system for acne scars, several imaging techniques

have been proposed in the literature ranging from ultrasound devices to ultraviolet cameras. In our study, we used a novel 3-dimensional facial modeling device (Clarity 3D Research Ti System, BrighTex Bio-Photonics, San Jose, CA) that uses 3 angled cameras to reconstruct a topographic map with quantitative volumetric measurements for each scar (Fig 1). We used the device to compare our graders' Goodman scores to computer-generated volume calculations of the patients' scars. For board-certified dermatologists, there was a statistically significant linear correlation (Spearman rank order correlation 0.76, $P < .05$) suggesting that facial scar imaging may help quantify postacne scarring (Fig 2).

In conclusion, based on this novel study, it appears that the level of dermatology training plays a significant role in the reliability of the acne scar grading. In addition, with increasing development of facial imaging and modeling, incorporation of these technologies for objective analysis will be essential for high-quality acne scarring research.

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The knock: An adjunct to education for improving outpatient hand hygiene

To the Editor: Evidence supports the effectiveness of hand hygiene in reducing health care—associated infections in hospitalized patients.[1] Infections are also commonly transmitted in the outpatient setting.[2] The importance of hand hygiene has been championed by the World Health Organization, Centers for Disease Control and Prevention, and Joint Commission as a critical component of high reliability health care.[1,3-5] Even so, adherence to hand hygiene protocols is far from perfect.[1] Dermatology resident physicians at the University of Mississippi Medical Center (UMMC) recognized that faculty members often failed to adhere to hand hygiene protocols in outpatient clinics.

A quasi-experimental study involving direct observation of hand hygiene behavior assessed the benefit of interventions designed to improve hand hygiene adherence. The system is time-efficient, provides a simple method for monitoring and

Table I. Hand hygiene adherence before and after intervention

	Encounters (n)	Encounters with Adherence Documented	% Adherence
First observation (pre-interventions)	69	38	55.1
Second observation (post-interventions)	101	82	81.2
Third observation (post-interventions)	94	84	89.4

A chi-square analysis demonstrated a significant difference in these proportions χ^2 (2,N = 264) = 28.068, $P < .0001$). IBM Statistical Package for the Social Sciences (SPSS) software version 22 was used to analyze the data.