

# Improving Pediatric Acne Management and “Filling in Practice Gaps”: a Prospective Multicenter Study of Case-based Guideline Education

S. Feldstein, B.A., M. Afshar, M.D., A. Krakowski, M.D., L. Eichenfield, M.D.  
University of California, San Diego, and Rady Children's Hospital

## Practice Gaps in Pediatric Acne Treatment

A practice gap is “the gap between what the medical professional is doing or accomplishing in clinical practice (current reality) compared with what is or should be achieved in practice based on the best available evidence or professional knowledge (1).” Practice gaps are a problem in acne management. Though one of the most common skin conditions in children and adolescents, there is tremendous variation in acne treatment amongst health care professionals.

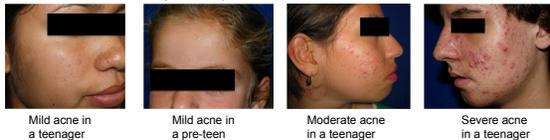
For example, while topical retinoids are extremely beneficial in the treatment of mild-to-moderate acne, and are important in maintenance therapy of all types of acne, they are inconsistently prescribed, especially by non-dermatologists (2). A retrospective review of the National Ambulatory Medical Care Survey (NAMCAS) found that amongst teenagers, topical retinoids were prescribed at 36.3% of dermatology visits but only at 15.7% of primary care visits (3). In preteens, topical retinoids were prescribed at 52% of dermatology visits but only 10.5% of primary care visits (3). In addition, a NAMCAS review reported significant use of topical antibiotic monotherapy, a practice that may lead to antimicrobial resistance (4,5). Primary care physicians also more commonly utilize oral antibiotics, without concurrent topical retinoids, a pattern of use different than dermatologists (3).

Interventions targeting providers can help decrease practice gaps (6,7), and adults have been shown to learn best in case-based, interactive educational sessions, as opposed to traditional didactic formats (8). In our study, we employ a case-based educational intervention targeting pediatrician's knowledge of the 2013 evidence-based guidelines for the treatment of pediatric acne published by the American Acne and Rosacea Society (AARS) in conjunction with *Pediatrics* (5). We surveyed both baseline knowledge and immediate knowledge gain after a 1 hour-case based interactive learning session. We hypothesized that after the intervention, providers would demonstrate increased ability to choose acne treatments in concordance with the evidence-based guidelines.

## Methods and Case-Based Questions

Participants were recruited at 3 educational conferences throughout the United States. They rated their knowledge of and confidence in prescribing according to the AARS guidelines on a 5-point scale. They also answered 5 case-based questions choosing the next best step for a variety of patients with acne both before and after the educational intervention. Responses were evaluated for being consistent with guideline recommendations or not consistent.

- 1) A 16-year-old girl with 25 closed comedones on her face and a few inflammatory lesions (mild acne).
- 2) A 10-year-old girl with 20 closed comedones on the forehead and no inflammatory lesions (mild acne).
- 3) A 14-year-old girl with 25 inflammatory papules and 35 open and closed comedones on the face (moderate acne).
- 4) A 14-year-old boy with a moderate amount of inflammatory papules and pustules on the forehead, cheek, chin, chest, and back (moderate acne).
- 5) A 15-year old boy with extensive inflammatory lesions and a small amount of diffuse scarring on his face (severe acne). He has been using OTC salicylic acid wash.



## Demographics

134 providers participated. We collected the following data: % (number)  
**Specialty:** Pediatricians 81% (108); Pediatric Residents 10% (13); Nurse Practitioners 5% (7); Physician Assistants 4% (5); Family Practitioners 1% (1)  
**Gender:** Female 64% (86); Male 36% (48)  
**Location:** Suburban 58% (77); Urban 35% (47); Rural 7% (10)  
**Practice Setting:** Pediatric Group Practice 44% (59); Academic Center 18% (24); Pediatric Solo Practice 16% (21); Multi-Specialty Group 16% (21); Hospital 5% (7); Other 1% (2)  
**Years in Practice:** 0-5 years 19% (25); 5-10 years 13% (18); 10-20 years 23% (31); >20 years 45% (60)

## Pre-Intervention Guideline Knowledge

Figure 1a. Self-Rated Knowledge of the AARS Guidelines

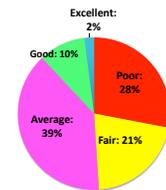


Figure 1b: Self-Rated Confidence in Prescribing According to the AARS Guidelines



## Case-Based Exam Results

Figure 2. Percentage of Correct Answers to the Case-Based Exam, Before and After an Educational Intervention

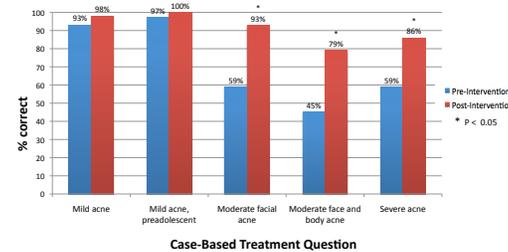
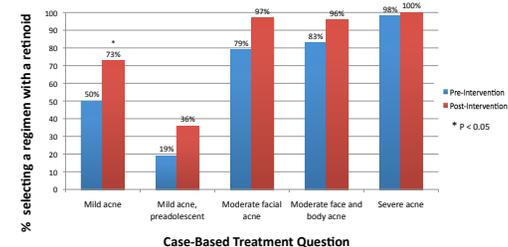
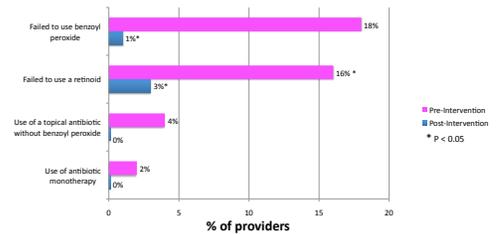


Figure 3. Percentage of Providers Including a Retinoid in the Treatment Regimen, Before and After an Educational Intervention



## Moderate Acne Management Errors

Figure 4. Errors in Management of Moderate Acne, Pre- and Post-Intervention



## Discussion

The AARS guidelines on pediatric acne management have been disseminated with mixed impact on pediatric care providers; pre-intervention, almost 1/3 of participating providers reported “poor” knowledge of them, and only 2% of providers had “excellent” knowledge of them. Confidence in prescribing according to the guidelines was similarly low. These trends illustrate the importance of targeted interventions to improve provider knowledge of and confidence in using evidence-based guidelines.

Total test scores increased significantly ( $P < 0.05$ ) after the case-based learning intervention; average pre-test score was 71%, and average post-test score was 87%. While most providers were able to choose a treatment regimen consistent with guideline recommendations for mild acne before our intervention, many had difficulty initiating treatment for moderate and severe acne, commonly omitting one or more elements of the recommended combination therapy. A small number of providers also inappropriately chose to treat with antibiotic monotherapy or with topical antibiotics unaccompanied by benzoyl peroxide. Post-intervention, significantly more providers chose a treatment in accordance with evidence-based guidelines for pediatric patients with moderate and severe acne, and no providers chose inappropriate antibiotic therapy. These results demonstrate that a learning intervention targeting practice gaps can have a significant impact on provider knowledge.

Though retinoids are a fundamental acne treatment, only 50% of providers before the intervention would prescribe them to treat mild acne in a teenager, and only 19% to treat mild acne in adolescents, but not in preteens (36%). This is an important area for further education, as pre-adolescents tend to be comedone-predominant and could especially benefit from retinoid use.

Study limitations: The prescribing behavior of pediatric providers caring for actual patients was not observed; instead, behavior was assessed using case-based scenarios. Also, there is a lack of long term-follow up to evaluate retention of knowledge gained from the intervention.

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