Emerging Challenges in Primary Care: 2018

Atopic Dermatitis:
New Insights, New Therapies

Final Live Outcomes Report

October 12, 2018

Sanofi Genzyme and Regeneron Pharmaceuticals
Grant ID: IME-2017-11894

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Executive Summary

- This curriculum focused on characterizing atopic dermatitis and the application of emerging therapies.
- Significant improvements were seen across all learning domains within the curriculum, ranging from 25%–105%.

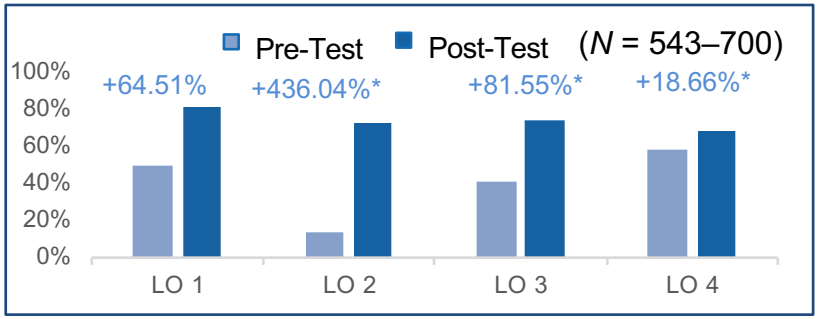
1,608* Total Attendees

3 Cities

581 On Site

1027* Simulcast/ Virtual Symposium

Pre- to Post-Test Results By Learning Objective



- **65% Improvement**: Review and characterize the clinical features of atopic dermatitis (AD).
- **436% Improvement**: Discuss the current immuno-pathophysiology of AD.
- **82% Improvement**: Identify strategies for comprehensive treatment of atopic dermatitis in pediatric and adult populations.
- **19% Improvement**: Evaluate the clinical application of emerging therapies including topical and targeted biologic agents in the management of AD.

Impact

- 1,608 attendees in multiple professional specialties were reached via both online and live formats, with gains consistent across cohorts and modalities.
- Along with these improvements, a deficit in learner understanding of the pathophysiology of AD was identified; this persistent gap could impact clinicians' ability to optimally individualize AD management using the growing number of agents available.

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*These numbers represent the total number of attendees, irrespective of assessment participation

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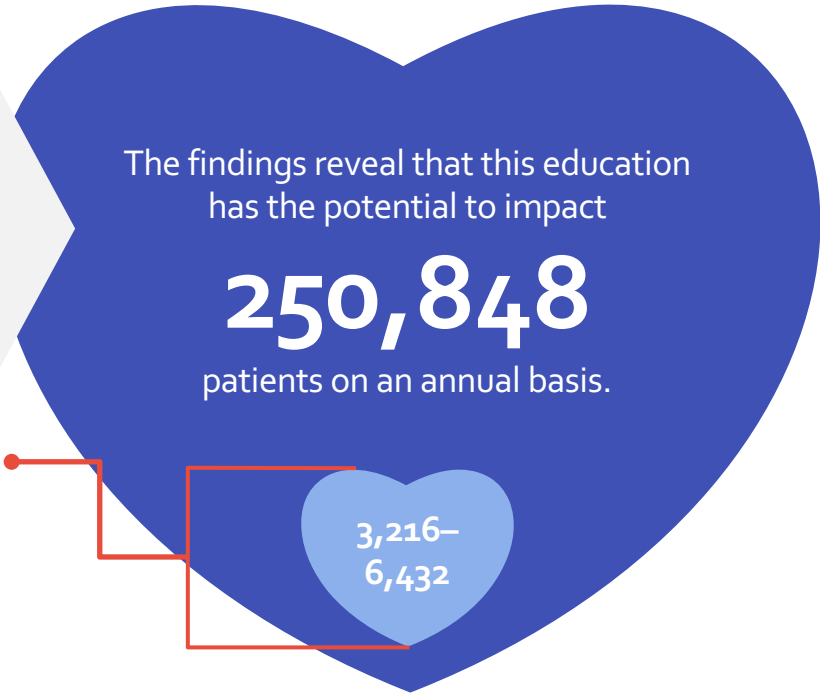
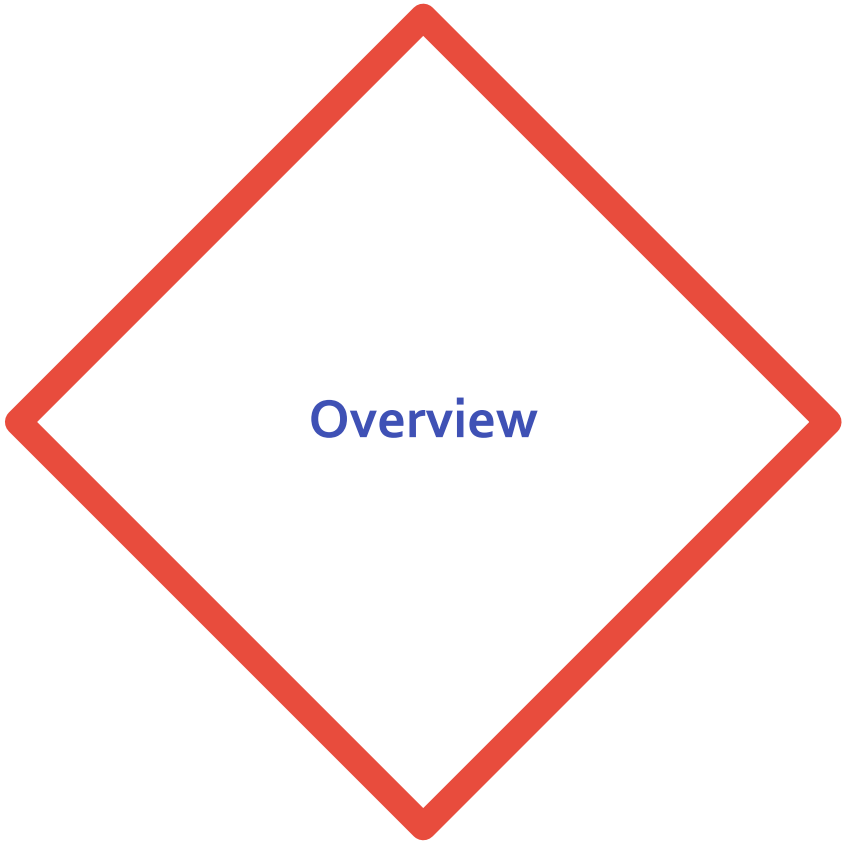
Curriculum Patient Impact

In the evaluation, learners (N = 1,608) were asked to report how many patients with atopic dermatitis they see in any clinical setting per week by selecting a range. The resulting distribution of learner responses was then extrapolated to reflect the total number of learners who have attended the onsite and online meetings.




Overview

Curriculum Overview

- Accredited Live Regional Symposia: May 5, 2018 – June 16, 2018
  - The live symposia were held in 3 cities with simulcast from one city.
- Virtual Symposium: June 23, 2018, a presentation as part of the live virtual conference, “Emerging Challenges in Primary Care: 2018.”
- Non-accredited “Clinical Highlights” - The program content was reinforced to participants with a document containing key teaching points from the program and was distributed 1 week after the meeting.
- Enduring Symposium Webcast:
  - Launch Date: August 1, 2018
  - End Date: July 31, 2019
  - Hosted at: http://naceonline.com/CME-Courses/course_info.php?course_id=1025

Learning Objectives

- Review and characterize the clinical features of atopic dermatitis (AD)
- Discuss the current immuno-pathophysiology of AD
- Identify strategies for comprehensive treatment of AD in pediatric and adult populations
- Evaluate the clinical application of emerging therapies including topical and targeted biologic agents in the management of AD

Outcomes Methodology

Learning outcomes were measured using matched Pre-Test and Post-Test scores for the learning domains (Knowledge, Competence, Confidence, and practice strategy) and across all of the curriculum's Learning Objectives.

Outcomes Metric	Definition	Application
Percentage change	This is how the score changes resulting from the education are measured. The change is analyzed as a relative percentage difference by taking into account the magnitude of the Pre-Test average.	Differences between Pre-Test, Post-Test, and PCA score averages
P value (p)	This is the measure of the statistical significance of a difference in scores. It is calculated using dependent or independent samples t-tests to assess the difference between scores, taking into account sample size and score dispersion. Differences are considered significant for when $p \leq .05$.	Significance of differences between Pre-Test, Post-Test, and PCA scores and among cohorts; significance of drivers in predictive modeling
Effect size (d)	This is a measure of the strength/magnitude of the change in scores (irrespective of sample size). It is calculated using Cohen's d formula, with the most common ranges of d from 0-1: d < .2 is a small effect, d=.2-.8 is a medium effect, and d > .8 is a large effect.	Differences between Pre-Test, Post-Test, and PCA score averages
Power	This is the probability (from 0 to 1) that the "null hypothesis" (no change) will be appropriately rejected. It is the probability of detecting a difference (not seeing a false negative) when there is an effect that is dependent on the significance (p), effect size (d), and sample size (N).	Differences between Pre-Test, Post-Test, and PCA score averages
Percentage non-overlap	This is the percentage of data points at the end of an intervention that surpass the highest scores prior to the intervention. In this report, it will reflect the percentage of learners at Post-Test who exceed the highest Pre-Test scores.	Differences between Pre-Test, Post-Test, and PCA score averages

Participation

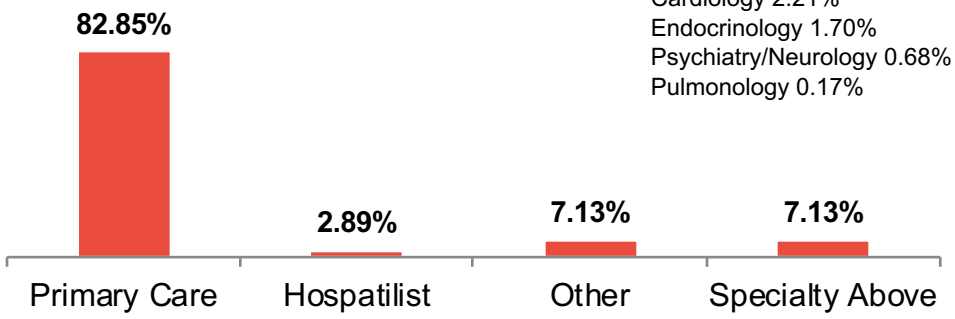
- “Activity participants” are those attendees who responded to any question in the activity.
- “Percentage participants” represents the portion of attendees who are participants.

2018 Symposium/Simulcast	Date	Attendees	Assessment Participants	Percentage Participants
Baltimore, MD	5/5/18	218	181	83%
Baltimore, MD/Simulcast	5/5/18	372	180	48%
Birmingham, AL	5/19/18	195	176	90%
Raleigh, NC	6/16/18	168	139	83%
Virtual Symposium	6/23/18	655	290	44%
Total		**1608**	**966**	66%


Level 1:
Demographics & Patient Reach

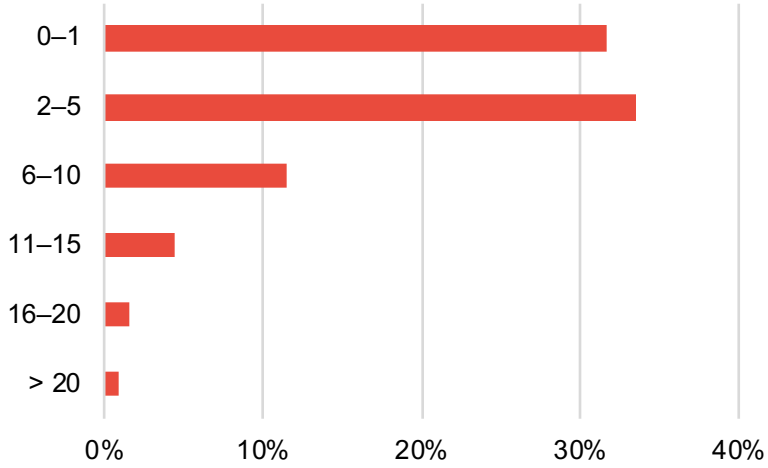
Level 1: Participation

Specialty



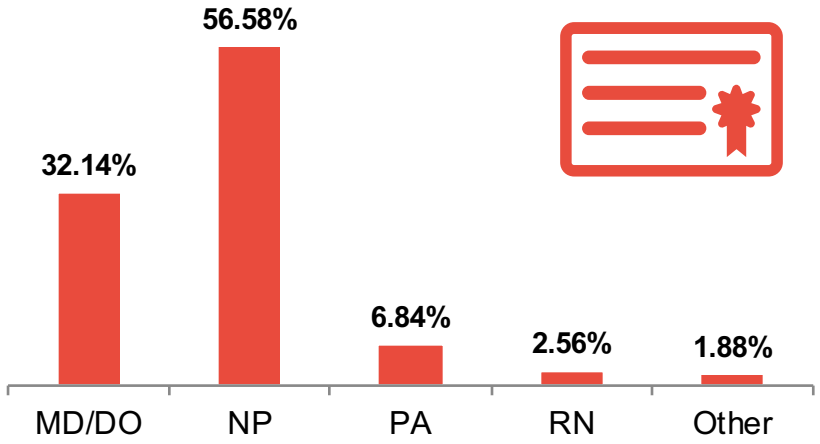
Specialists:
Emergency/critical 2.38%
Cardiology 2.21%
Endocrinology 1.70%
Psychiatry/Neurology 0.68%
Pulmonology 0.17%

Patients with AD seen each week, in any setting:



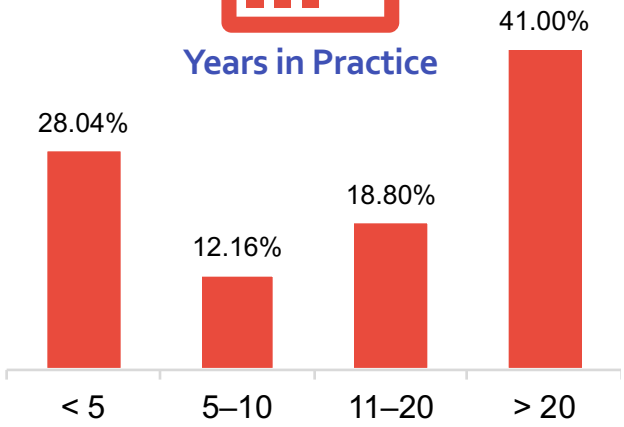
Patient Care Focus: 94%

Profession



Patients with AD seen per week: 3 per clinician

Years in Practice



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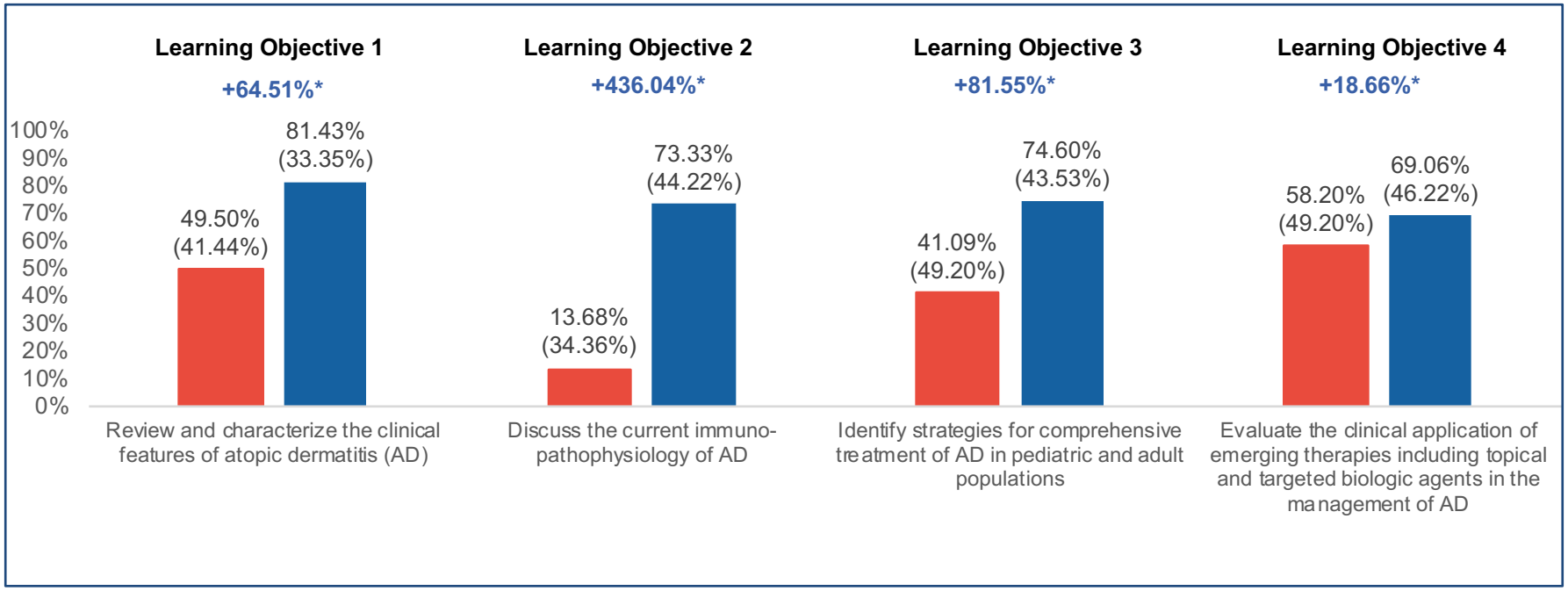
Level 2-5:
Outcomes Metrics

Learning Objectives Analysis

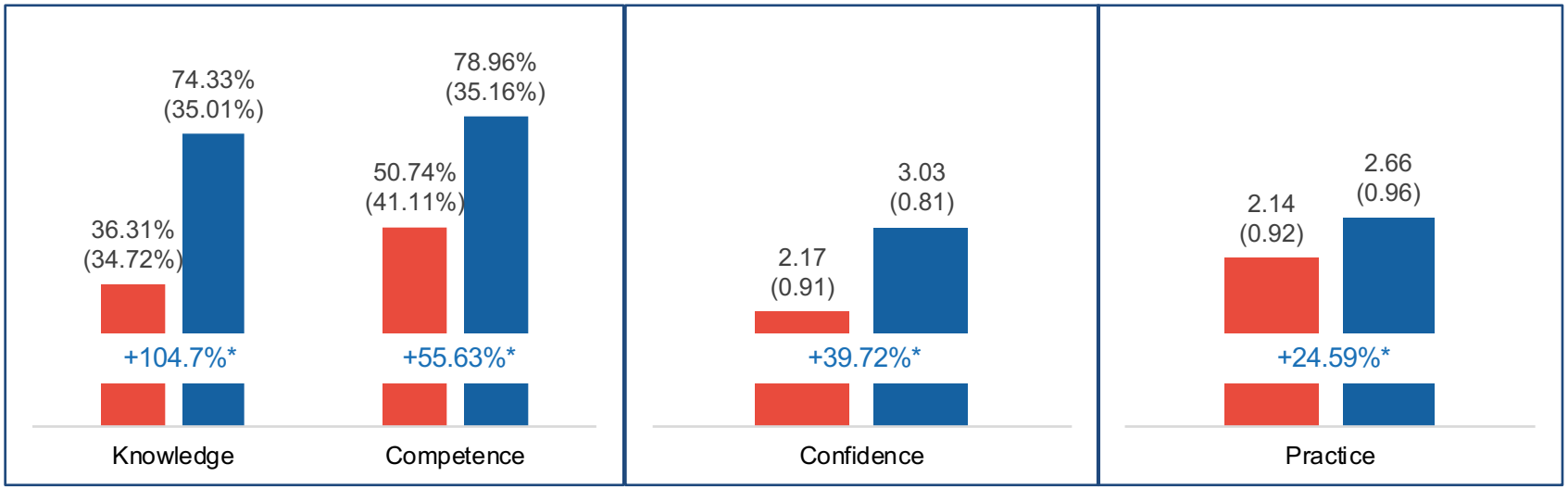


(*N* = 543–700)

significant at the $p \leq 0.05$ level

- Significant gains on all Learning Objectives were achieved, ranging from 19% to 436%.
- Learning Objective 2 showed the greatest score increase from the lowest Pre-Test average score.
- Learning Objective 4 showed the smallest gains, despite having the highest Pre-Test score.
  - Learners demonstrated difficulty identifying the mechanism of action for the biologic agent dupilumab.

Learning Domain Analysis



significant at the p ≤ 0.05 level, matched data

- Significant gains (25%–105%) were achieved in all learning domains from Pre-Test to Post-Test.
- Learners improved their proficiency most strongly in the Knowledge and Competence domains (56%–105%).
- Learners substantially (40%) increased their reported Confidence in their ability to manage patients with moderate-to-severe atopic dermatitis.
- In the Practice domain, there was also a substantial (25%) increase in reported intent to use systemic therapy for patients with moderate-to-severe atopic dermatitis.

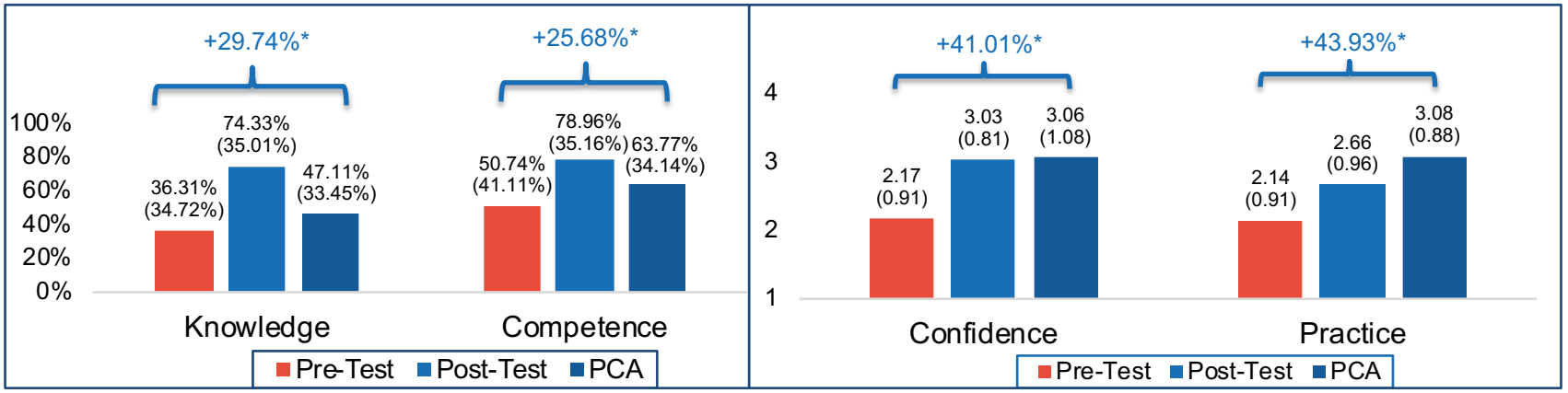
Learning Domain by Professional Cohort

Learning Domain	Nurse Practitioner				Physician			
	N	Pre Test	Post Test	% Change	*N*	Pre Test	Post Test	% Change
Knowledge	169	31.74% (29.61%)	72.48% (32.11%)	+128.3%*	112	41.88% (35.14%)	80.06% (30.98%)	+91.16%*
Competence	184	49.60% (38.71%)	82.84% (29.44%)	+67.03%*	105	48.37% (40.37%)	75.35% (37.56%)	+55.77%*
Confidence	168	2.13 (0.86)	3.04 (0.84)	+42.74%*	119	2.26 (0.92)	3.11 (0.79)	+37.55%*
Practice	183	2.03 (0.89)	2.73 (0.94)	+34.68%*	119	2.11 (0.96)	2.59 (0.88)	+22.22%*

significant at the $p \leq 0.05$ level

- Nurse practitioners and physicians demonstrated statistically significant gains in all learning domains.
- Comparable ratings were observed by both cohorts in Confidence and practice strategy.
- Physicians demonstrated higher Pre-Test and Post-Test scores in Knowledge, while NPs demonstrated higher scores in Competence.
  - These differences were present across questions in each domain, and not driven by outliers.

4 Week Retention Analysis



significant at the p ≤ 0.05 level

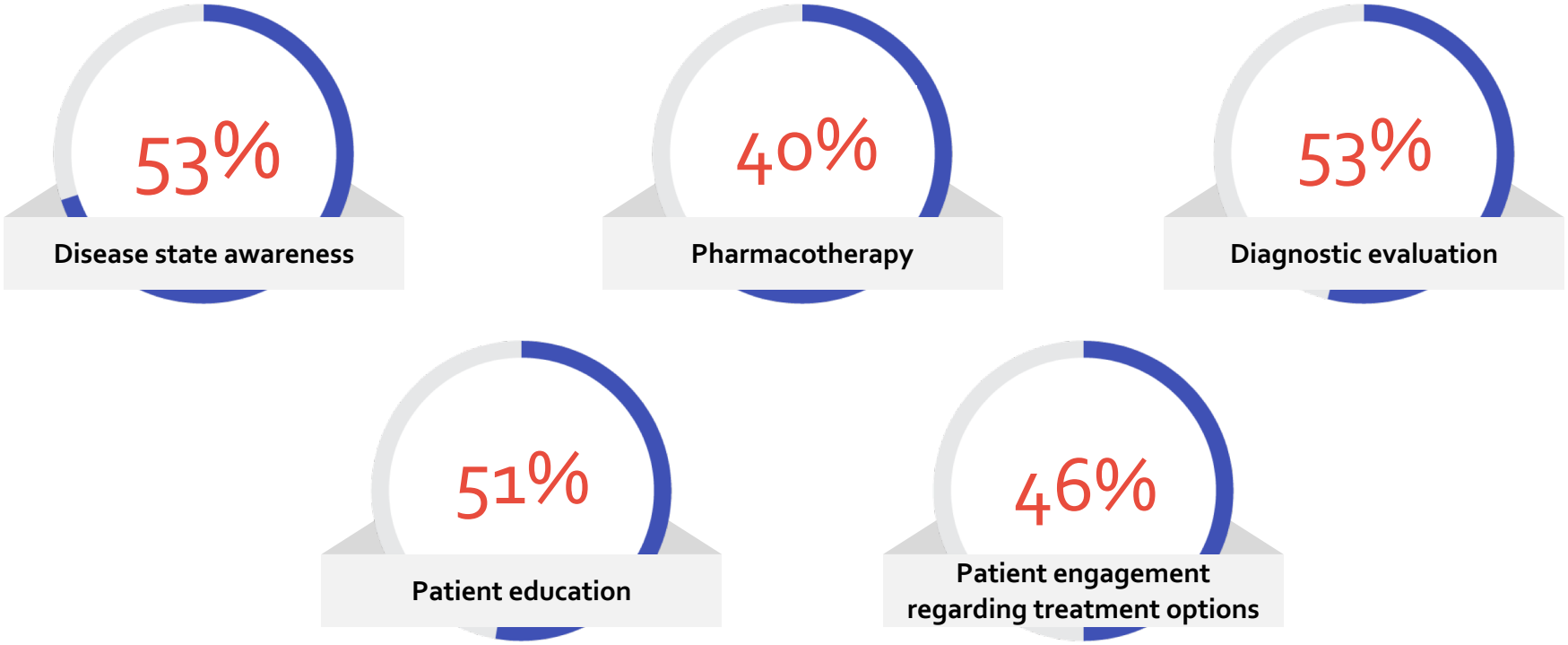
At follow-up (N = 225):

- Net gains were measured from Pre-Test to the Post Curriculum Assessment (PCA) in all learning domains.
  - Unmatched t-tests showed that the net gains in all domains were significant.
- Score slippage was observed in Knowledge and Competence from Post-Test to PCA. Confidence and practice strategy ratings increased significantly.

(4-week Post Assessment)

Please select the specific areas of skills, or practice behaviors, you have improved regarding the treatment of patients with atopic dermatitis since this CME activity. (Select all that apply.)

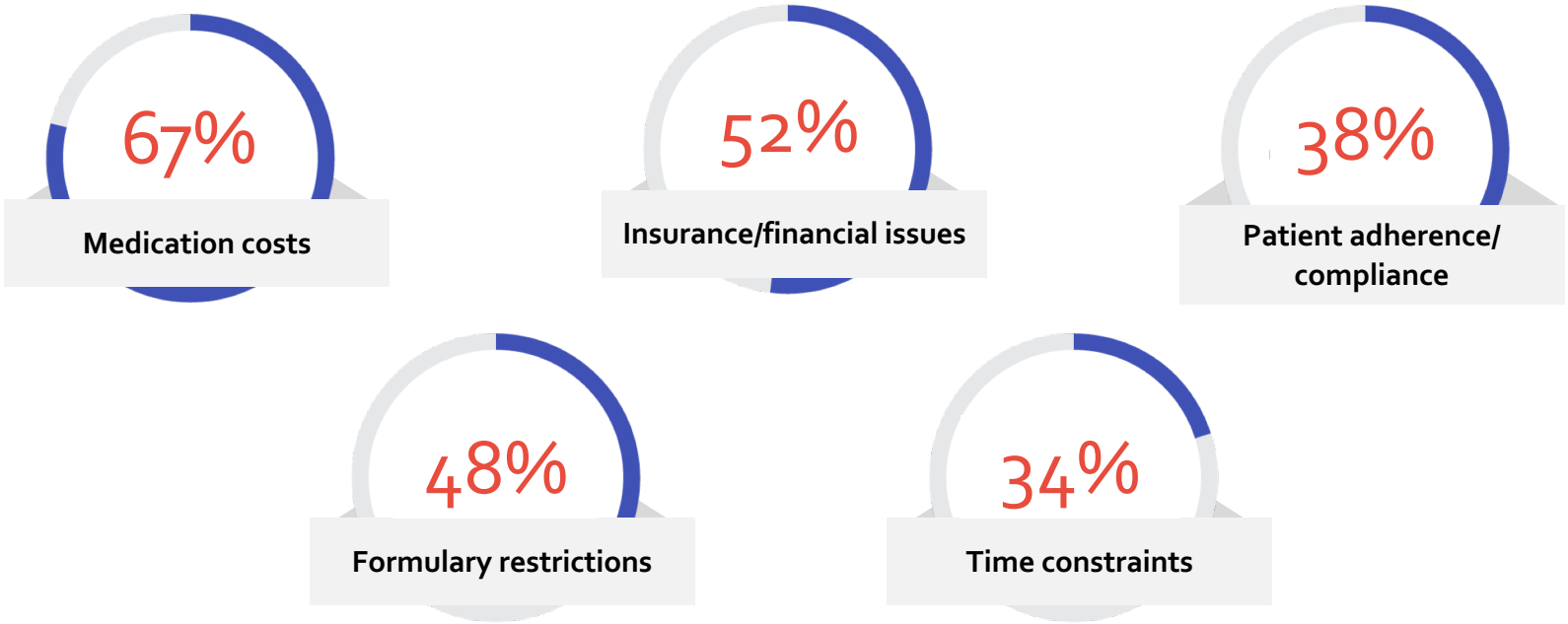
N=297



(4-week Post Assessment)

What specific barriers have you encountered that may have prevented you from successfully implementing strategies for patients with atopic dermatitis since this CME activity? (Select all that apply)

N=297



Curriculum/Activity Intervention Effect

Learning Domain	Effect Size*	% Non-Overlap
Knowledge	0.890	48.63%
Competence	0.625	38.44%

*Effect Size Definition: This is a measure of the strength/magnitude of the change in scores (irrespective of sample size). It is calculated using Cohen's d formula, with the most common ranges of d from 0-1: d < .2 is a small effect, d=.2-.8 is a medium effect, and d > .8 is a large effect.

Identified Learning Gaps:

Pathophysiologic mechanisms underlying AD and the mechanism of action of biologic agents

The lowest scoring questions in the curriculum included Knowledge questions that related to the role of Th2/Th22 immune abnormalities in the pathophysiology underlying AD and the mechanism of action of dupilumab.

Knowledge Questions:

Which of the following pathophysiologic mechanisms is the fundamental abnormality underlying atopic dermatitis?

Results:

- At Post-Test, 68% of learners correctly answered: “Th2/Th22 immune abnormalities”.
- At Post-Test, 13% of learners incorrectly answered “Overproduction of IgM in response to allergens” and 13% incorrectly answered “Inflammation driving increased keratinocyte turnover”.

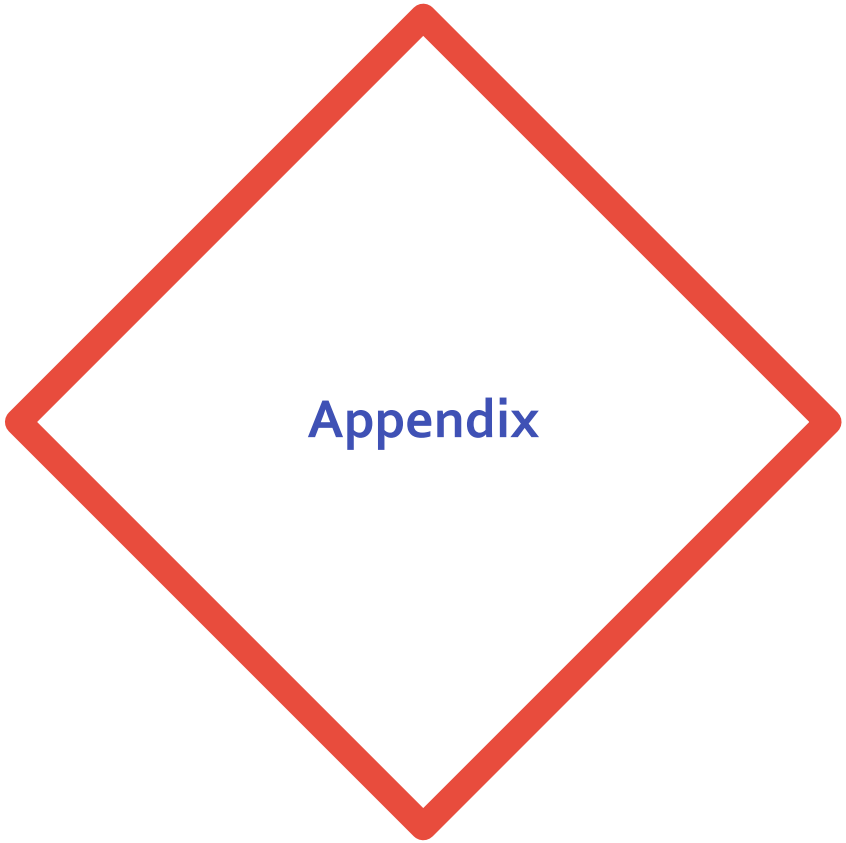
The new biologic agent dupilumab acts through which of the following mechanisms?

Results:

- At Post-Test, 67% of learners correctly answered: “Blocks IL-4 receptors.”
- At Post-Test, 15% of learners incorrectly answered “Blocks JAK activity.”

Overall Educational Impact

- This curriculum focused on discussing and developing care of moderate-to-severe patients with atopic dermatitis, with a focus on emerging therapies.
- Significant improvements were seen across all learning domains, ranging from 25%–105%.
  - Nurse practitioners and physicians independently demonstrated improvement in all learning domains.
  - There were comparable improvements in all learning domains demonstrated by simulcast and live meeting learners.
- Significant improvements were seen across all Learning Objectives, ranging from 19%–436%.
- The analysis of the Knowledge and Competence domains identified a **persistent learning gap related to specific biological mechanisms related to atopic dermatitis.** These included the mechanism of action of dupilumab, and the relation of Th2/Th22 abnormalities to AD pathophysiology.
  - For the Knowledge question on the pathophysiology of AD, 68% of learners recognized “Th2/Th22 immune abnormalities” as an underlying mechanism, with large proportions of learners (26%) incorrectly answering either “Overproduction of IgM in response to allergens” or “Inflammation driving increased keratinocyte turnover”.
  - For the Knowledge question on the mechanism of action of dupilumab, 67% of learners correctly answered “Blocks IL-4 receptors”, with a large proportion (15%) incorrectly answering “Blocks JAK activity.”


Appendix

Learning Objectives Analysis – Live Onsite vs. Live Online Audience

- "Live onsite learners" include only those attending in-person meetings.
- "Live online learners" include those from both the Simulcast and Virtual Symposium.

Learning Objective	Live Onsite Learners				Live Online Learners			
	N	Pre-Test	Post-Test	% Change	*N*	Pre-Test	Post-Test	% Change
1: Review and characterize the clinical features of atopic dermatitis (AD)	412	49.64% (41.00%)	84.34% (30.63%)	**+69.9%***	288	49.31% (42.08%)	77.26% (36.49%)	**+56.7%***
2: Discuss the current immuno-pathophysiology of AD	351	10.54% (30.71%)	74.64% (43.50%)	**+720%***	234	18.38% (38.73%)	71.37% (45.20%)	**+388%***
3: Identify strategies for comprehensive treatment of AD in pediatric and adult populations	320	39.69% (48.93%)	72.19% (44.81%)	**+81.9%***	247	42.92% (49.50%)	77.73% (41.60%)	**+81.1%***
4: Evaluate the clinical application of emerging therapies including topical and targeted biologic agents in the management of AD	331	54.38% (49.81%)	69.18% (46.17%)	**+27.2%***	212	64.15% (47.96%)	68.87% (46.30%)	**+7.35%**

significant at the $p \leq 0.05$ level

Learning Domain Analysis – Live Onsite vs. Live Online Audience

- "Live onsite learners" include only those attending in-person meetings.
- "Live online learners" include those from both the Simulcast and Virtual Symposium.

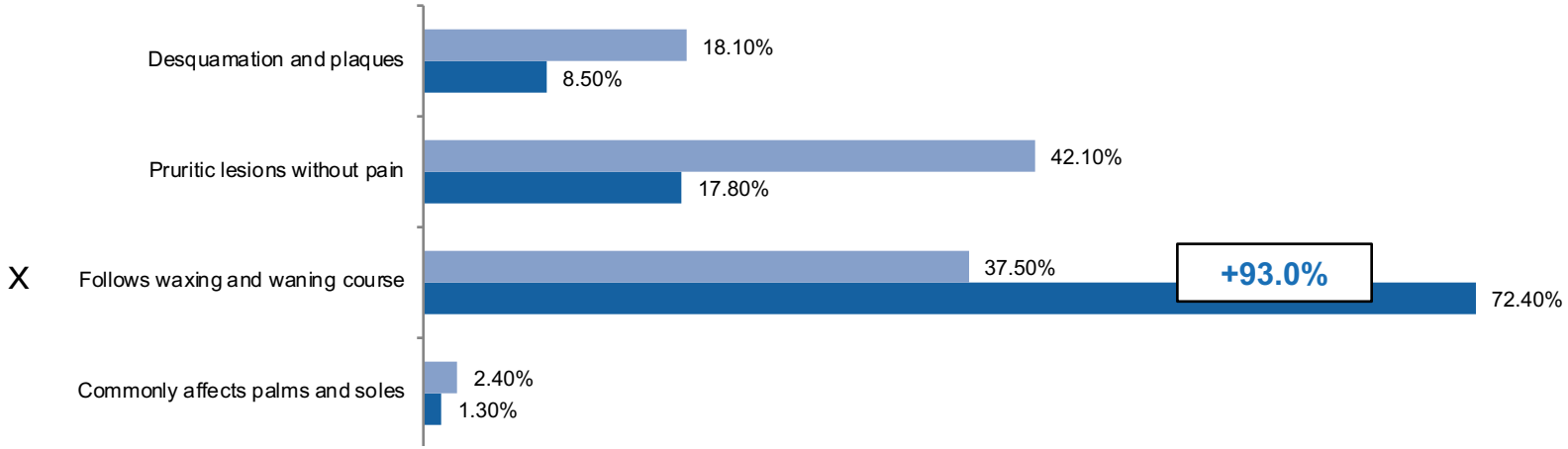
Learning Domain	Live Onsite Learners				Live Online Learners			
	N	Pre Test	Post Test	% Change	*N*	Pre Test	Post Test	% Change
Knowledge	331	35.70% (32.41%)	76.68% (31.88%)	+114.8%*	203	37.29% (37.69%)	70.57% (38.54%)	+89.26%*
Competence	320	49.24% (40.23%)	78.03% (36.03%)	+58.46%*	247	52.72% (42.14%)	80.20% (33.97%)	+52.10%*
Confidence	353	2.19 (0.95)	3.07 (0.82)	+39.87%*	148	2.09 (0.80)	2.92 (0.76)	+39.35%*
Practice	340	2.03 (0.93)	2.64 (1.00)	+29.29%*	231	2.28 (0.86)	2.70 (0.88)	+18.41%*

significant at the p ≤ 0.05 level

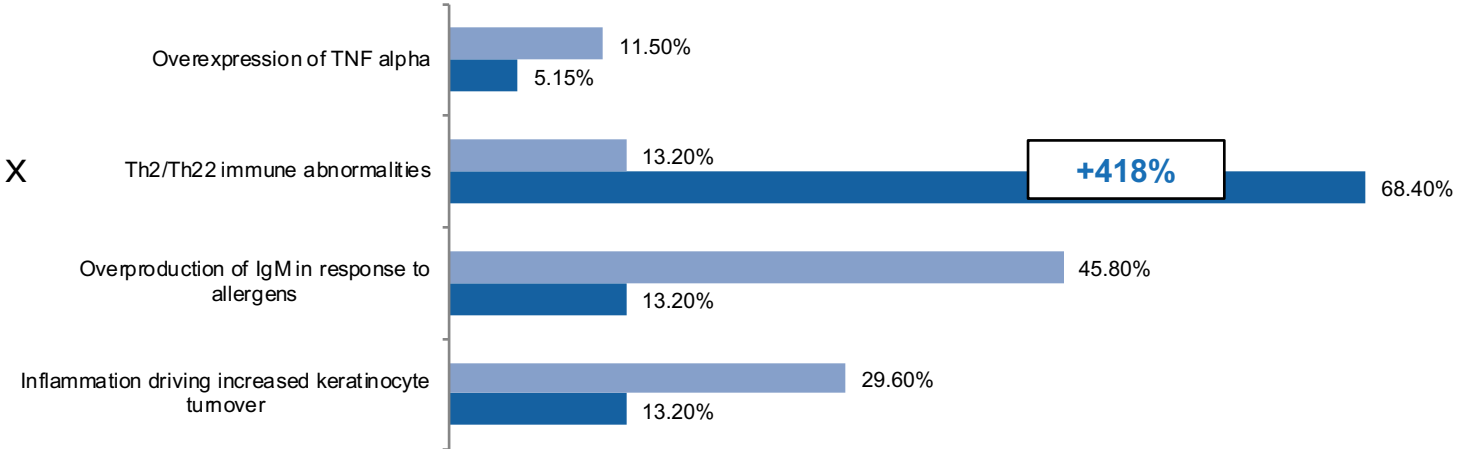
Knowledge Questions

N = (675–765)

Which of the following features is a characteristic of atopic dermatitis?



Which of the following pathophysiologic mechanisms is the fundamental abnormality underlying atopic dermatitis?



Pre-Test Post-Test

Note: Data is unmatched

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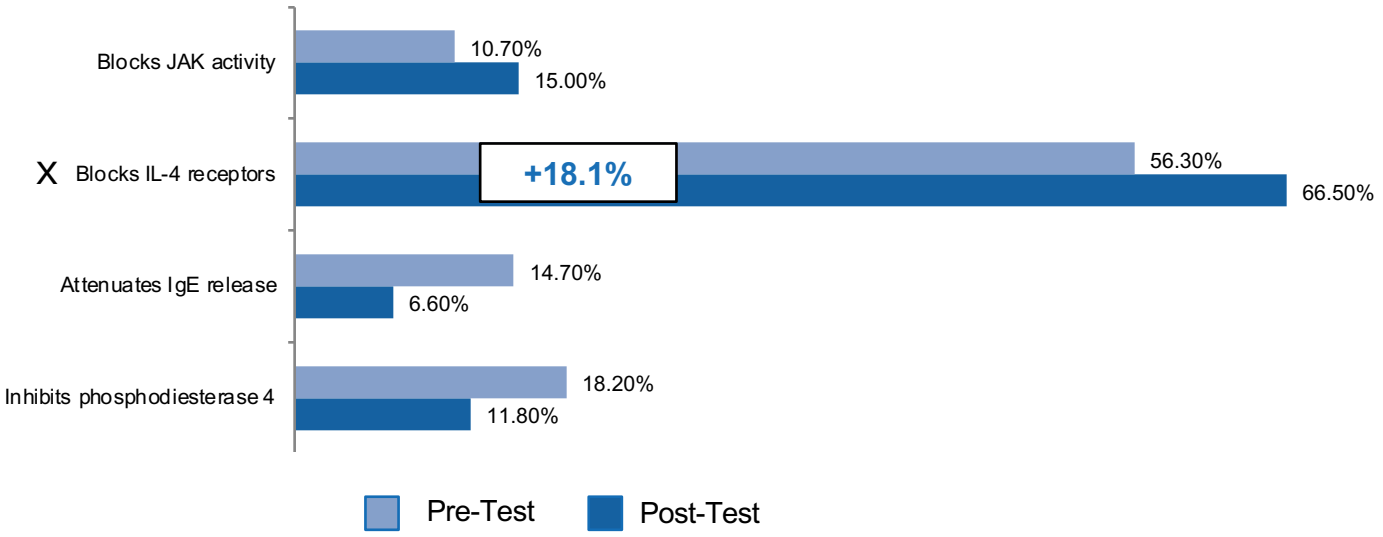
Knowledge Questions

N = (626–693)

The new biologic agent dupilumab acts through which of the following mechanisms?

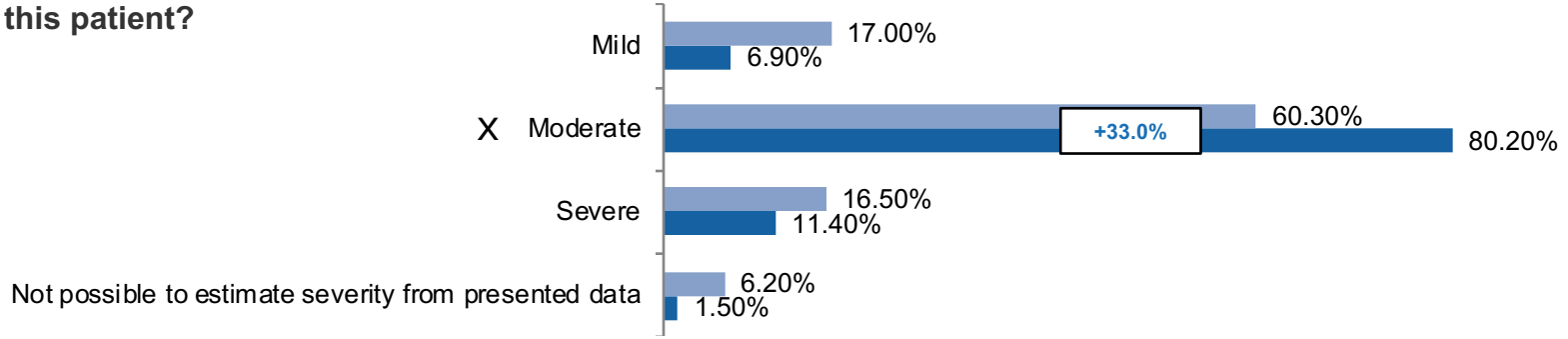


Note: Data is unmatched

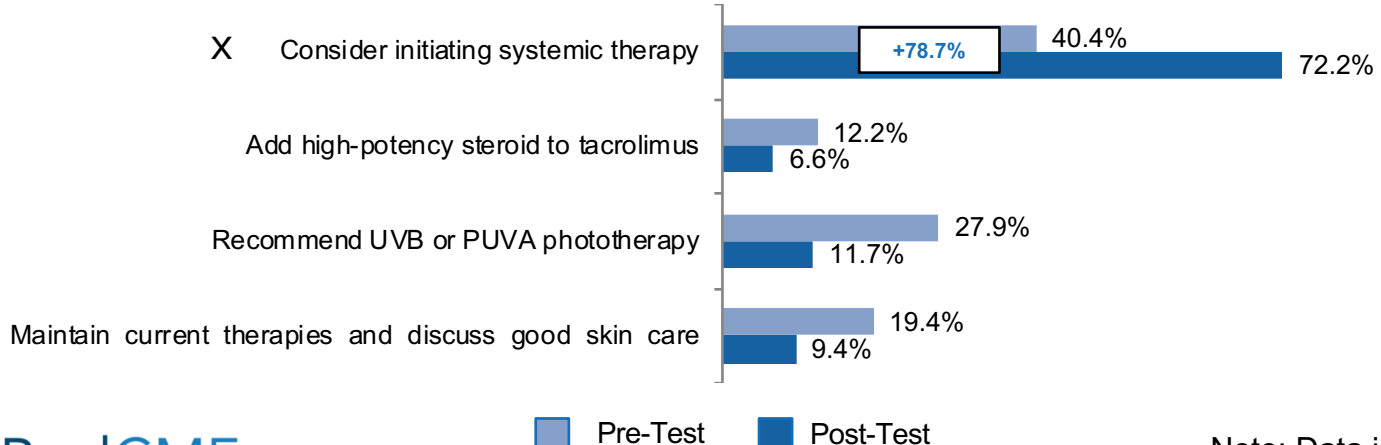
Competence Questions

N = (690–743)

A 19-year-old woman presents with a chief complaint of eczema on her face, arms, and abdomen. The rashes have a dull red appearance with perceptible elevation and mild excoriation. The patient says she scratches the rashes frequently and sometimes does not sleep well because of the itching. Using one palm, the clinician estimates that 8% of her body surface area is affected. What is the best estimate of disease severity in this patient?



26 y/o overweight woman with 15-yr hx of moderate-to-severe atopic dermatitis, asthma, and allergic rhinitis presents for a check-up Severity of atopic dermatitis is estimated to be moderate (15% BSA) with occasional trouble sleeping because of itching. Meds: fluticasone propionate, desloratadine, tacrolimus 0.1%, and moisturizers. Prior therapies include high-potency topical corticosteroids and pimecrolimus. She reports good adherence to therapy. What might be an appropriate action at this time?



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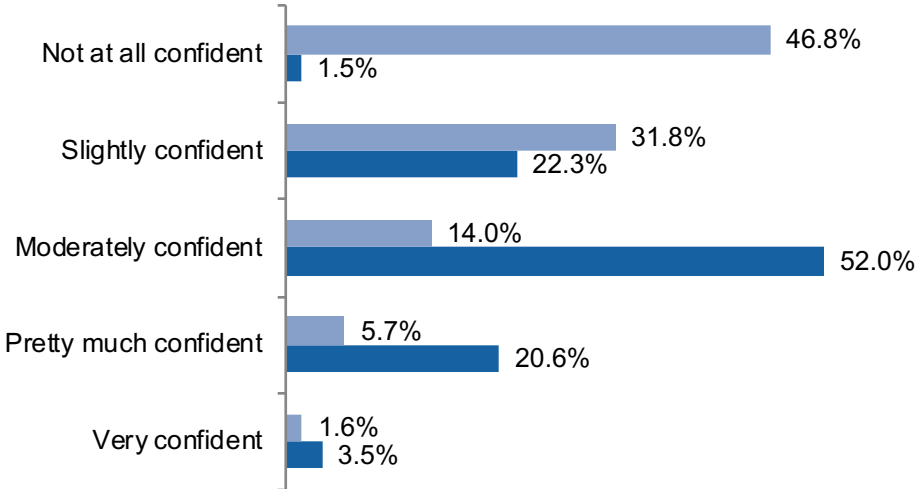
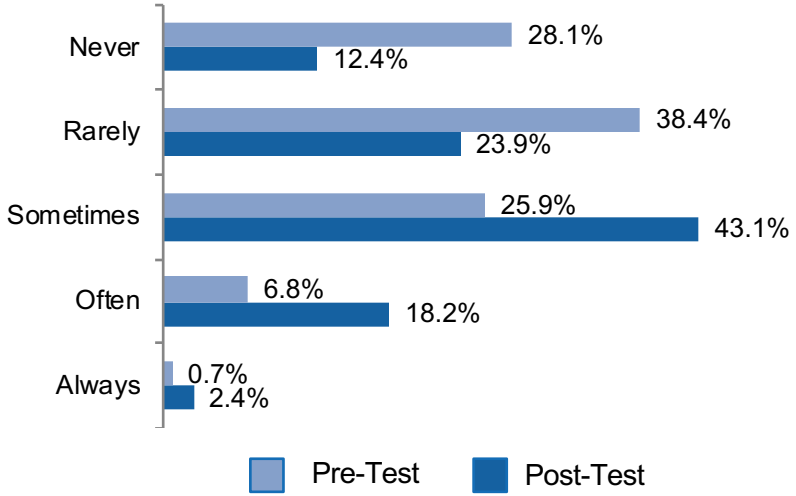
Confidence & Practice Questions

N = (597–762)

Confidence Question:
How confident are you in your ability to manage patients with moderate-to-severe atopic dermatitis?



Practice Question:
How often do you use systemic therapy with patients with moderate-to-severe atopic dermatitis?



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