
National Jewish Health®
Breathing Science is Life.
Epithelial Alarmins
A New Paradigm in Severe Asthma and Emerging Treatments
Grant ID: 70973419
Final Outcomes Summary
Online Data: 6/30/2022 – 6/30/2023

Table of Contents

Final Outcomes Summary – Online Enduring and Live Broadcasts

National Jewish Health

- Executive Summary (Slide 3)
- Program Features (Slide 4)
- Audience Generation (Slide 5)
- Overall Program Impact (Slide 6)
- Program Insights (Slide 7)
- Online Enduring Final Outcomes (Slide 8)
  - Educational Impact Summary (Slides 9-10)
  - Level 1 – Participation (Slides 11-12)
  - Level 2 – Satisfaction (Slide 13)
  - Level 3&4 – Knowledge and Competence (Slides 14-22)
  - Level 4 – Competence (Slides 23-24)
  - Evaluation Survey Results (Slide 25)
- Live Broadcasts (Slide 26)
  - Educational Impact Summary (Slides 27-28)
  - Level 1 – Participation (Slides 29-31)
  - Level 2 – Satisfaction (Slide 32)
  - Level 3&4 – Knowledge and Competence (Slides 33-36)
  - Level 4 – Competence (Slides 37-38)
  - Evaluation Survey Results (Slide 39)
- Accreditation (Slide 40)

Executive Summary

Final Outcomes Summary –Online Enduring and Live Broadcasts

National Jewish Health®

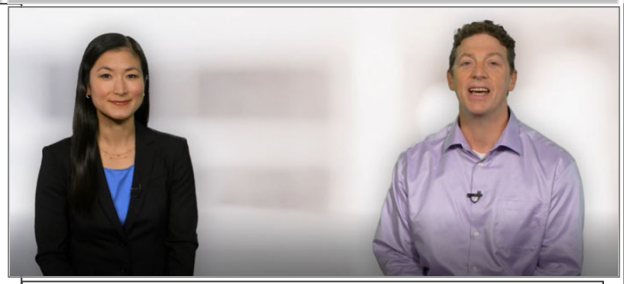
Program Overview

This program was a blended series of live grand rounds webinars hosted at specialty academic centers; live national webinars; and an online enduring activity. The national webinar was recorded and endured as an on-demand activity for twelve months on the Medscape platform. The activity included lecture and Q&A with expert faculty; animations to illustrate severe asthma pathophysiology and treatment targets; and case scenarios to illustrate management decisions.

Program Dates

National Broadcasts: 5/24/2022; 7/19/2022
Live Grand Rounds: 8/10/2022 (UNC); 9/20/2022 (OHSU); 11/17/2022 (ROCHESTER); 12/9/2022 (MT SINAI)
Online Enduring Dates: 6/30/2022-6/30/2023

Program Faculty



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Learning Objectives

(1) Describe the role of the respiratory epithelium in asthma development and progression.
(2) Define the epithelial alarmins and their impact on T2 and non-T2 airway inflammation, remodeling, and hyperresponsiveness in severe asthma.
(3) Evaluate the results of clinical trials of emerging therapies that target the epithelial alarmins in severe asthma.
(4) Match clinical characteristics and phenotypes to treatment targets.

Target Audience & Accreditation

Primary target audience: Pulmonologists and Allergists; **Secondary target audience:** Nurse Practitioners and Physician Assistants in those specialties.

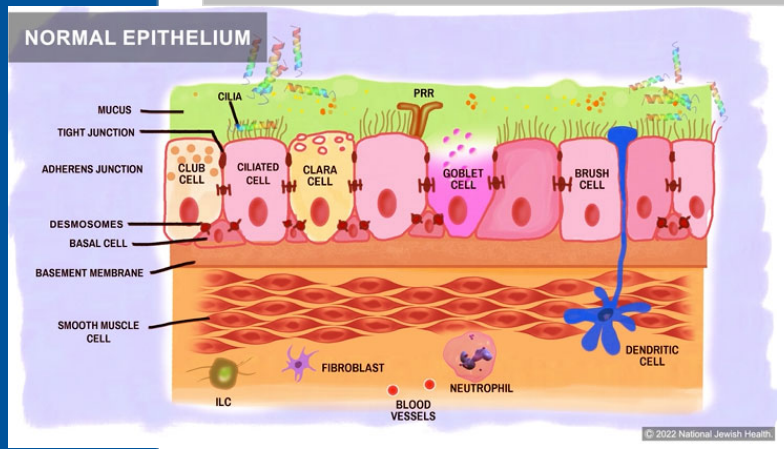
NJH designates the **live virtual activities** and the **enduring activity** for a maximum of **1.0** ***AMA PRA Category 1 Credit***™

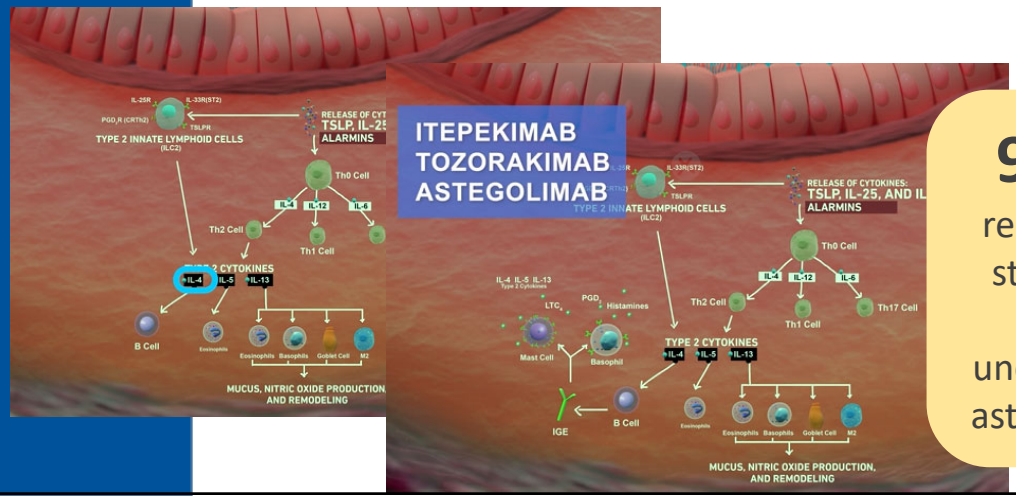
Program Features

Final Outcomes Summary – Online Enduring and Live Broadcasts

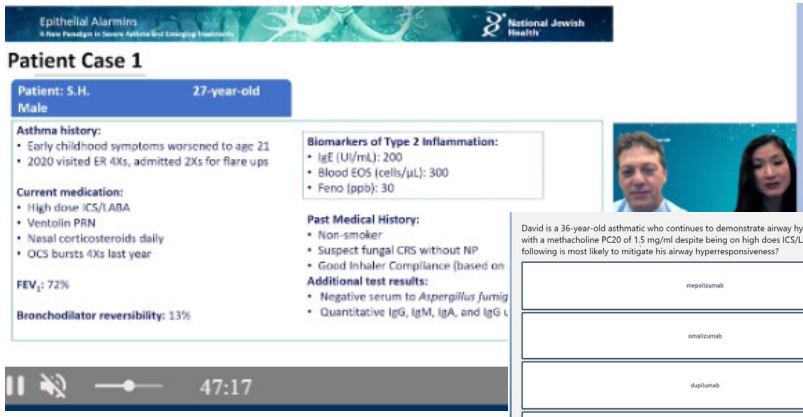
National Jewish Health

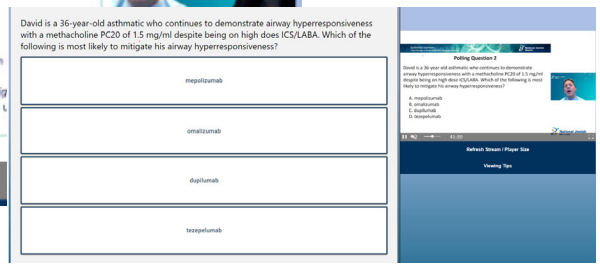
Whiteboard Animations





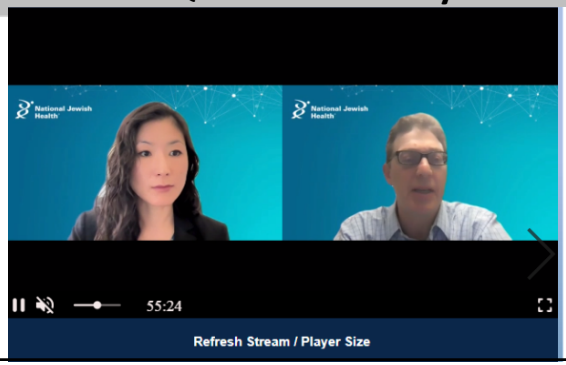
Patient Case Scenarios with Interactive Polling and Faculty Discussion





94% of evaluation respondents (N=1,673) stated the animations improved their understanding of severe asthma pathophysiology

Live Q&A with Faculty



Audience Generation

Final Outcomes Summary – Online Enduring and Live Broadcasts

Personalized targeting tools across numerous tactics reach HCPs by leveraging demographic data (such as location, profession, specialty) and behavioral data (such as learner participation history, areas of interest).

Personalized emails and e-newsletters: Medscape & NJH databases

Epithelial Alarmins: A New Paradigm in Severe Asthma and Emerging Treatments
CME *Expires 06/30/2023*

Social media ads and posts

Outreach to hospitals and academic medical centers for Grand Rounds presentations

Dedicated landing page on NJH website & Medscape platforms

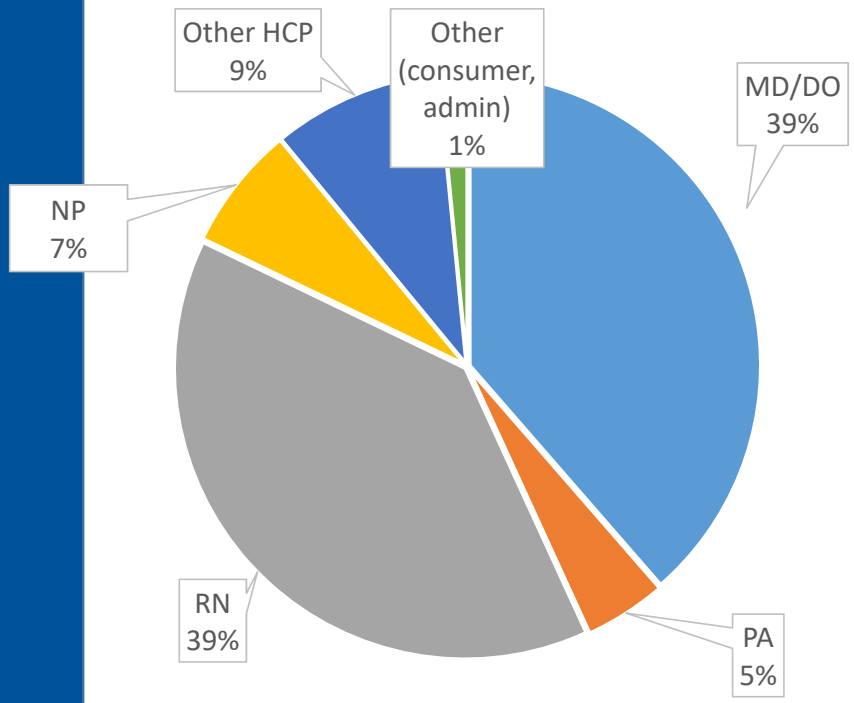
Medscape Smart Targeting and Search Engine Optimization (SEO)

Medscape Mobile Engagement (app notifications, targeted emails, social media)

Overall Program Impact

Final Outcomes Summary – Online Enduring and Live Broadcasts

National Jewish Health



Potential impact to 720,876 patient visits this year

MD/DO= 2169
NP=388
PA=256
RN=2189
Other HCP=529
Other (admin, consumer, etc)=87
Total Learners = 5,618

Nearly doubled physician learner guarantee and nearly tripled physician completer guarantee!

5,618 total learners across entire program:
249 learners/completers in live broadcasts
5,369 learners in online enduring

Live and Enduring	Guarantee	Actuals
Physician Learners	1,120	2,169
Physician Completers	220	603

Program Insights

Final Outcomes Summary – Online Enduring

National Jewish Health

- **59%** of physician learners in the online activity (N=2030) were from the target audience of pulmonologists and allergists/immunologists.
- **45%** of all learners in the live activity (N=249) were from the target audience of pulmonologists and allergists/immunologists.
- Although marketing efforts for the online enduring activity were directed at physicians, a large percentage of nurses participated in the activity, suggesting a **need for severe asthma education among nurses**.
  - A comparative analysis of test scores between nurses and physicians and APPs revealed that knowledge gaps are comparable in these learner cohorts.
- Learners still demonstrated a significant **knowledge gap related to the role of the respiratory epithelium in severe asthma**.
  - In the online enduring program, 47% could not correctly describe the role of the respiratory epithelium in asthma at post-test.
  - In the live broadcasts and Grand Rounds sessions, 52% could not correctly describe the role of the respiratory epithelium in asthma at post-test.
  - More in-depth education may be needed on the pathophysiology of severe asthma and the role of the respiratory epithelium.

Online Enduring Program

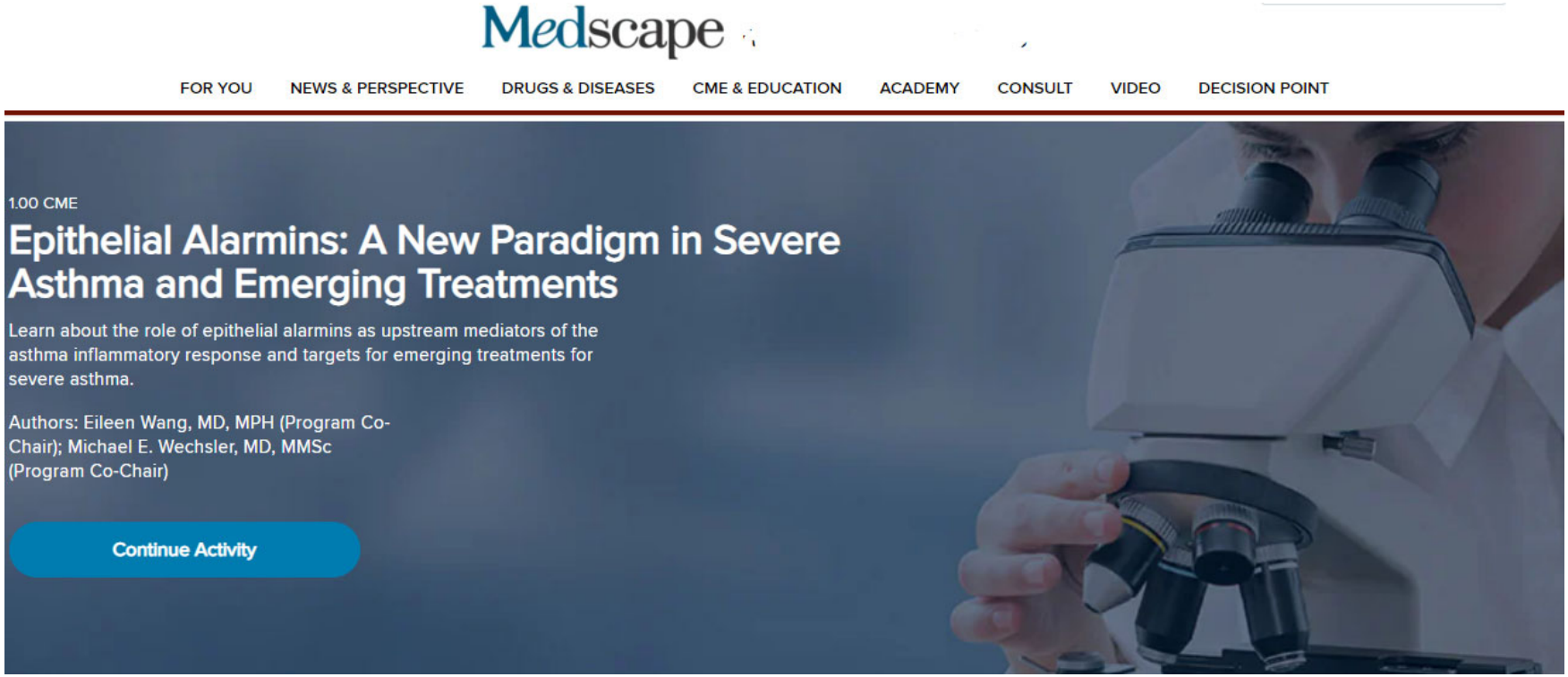
Final Outcomes Summary – Online Enduring

National Jewish Health

Medscape

Launched 6/30/2022

https://www.medscape.org/viewarticle/975912

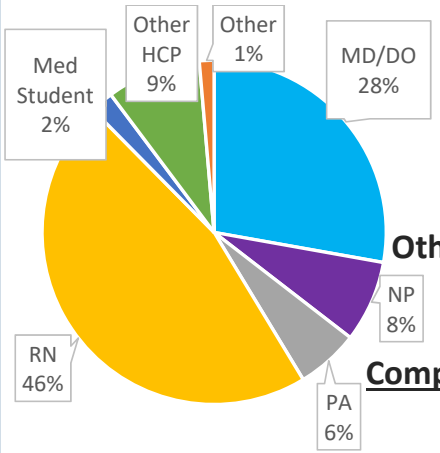


Educational Impact Summary

Final Outcomes Summary – Online Enduring

National Jewish Health

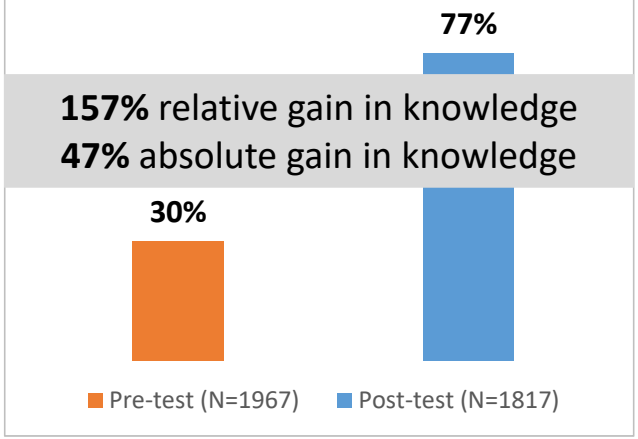
Participation



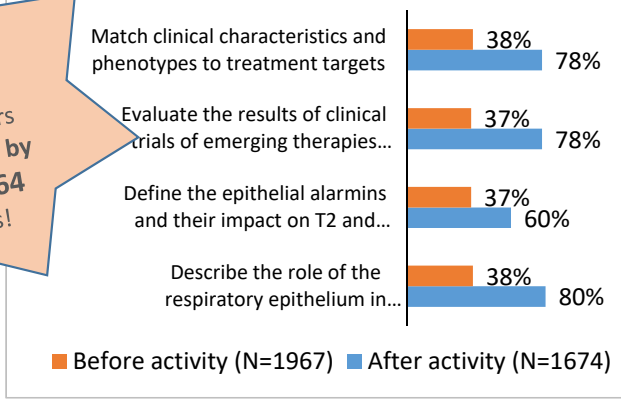
MD/DO=464
NP=128
PA=98
RN=772
Student=36
Other HCPs=148
Other=23
Total Completers= 1669

Physician Learner Guarantee	Physician Learners to Date (Actual)
1000	2,030
Physician Completer Guarantee	**Physician Completers to Date (Actual)**
100	464

Exceeded **learner guarantee by 1,030** learners and **guarantee by completer 364** completers!



Confidence Gain by Objective



Evaluation N=1,673

Met their educational needs **(94%)**

Reinforced or improved current skills **(94%)**

Improved ability to treat patients **(94%)**

91%

N=1,673

Evaluation respondents intend to make changes to practice as a result of the activity

Educational Impact Summary

Final Outcomes Summary – Online Enduring

National Jewish Health

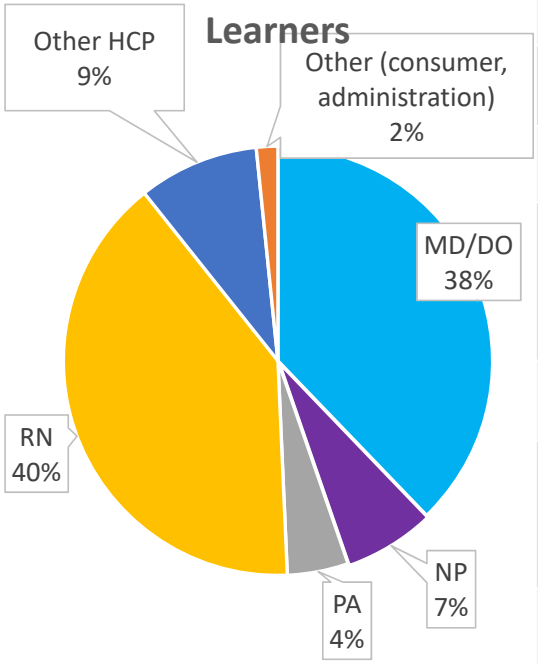
Patient Impact	Educational Impact	Practice Change
1,673 evaluation respondents	**153%** relative knowledge gain seen from learners in defining the epithelial alarmins and their impact on T2 and non-T2 airway inflammation, remodeling, and hyperresponsiveness in severe asthma (N=1,817)	**Top intended changes:** • Assess asthma phenotype as part of patient evaluation • Improve assessment of symptoms and exacerbations • Consider biologic agents when indicated
Who see **13,701** asthma patients weekly	**212%** relative knowledge gain in describing the role of the respiratory epithelium in asthma development and progression (N=1,817)	**92%** indicated the activity addressed strategies for overcoming barriers to optimal patient care (N=1,673)
Which translates to **712,452** potential patient visits impacted annually	**107%** relative knowledge gain seen in evaluating the results of clinical trials of emerging therapies that target the epithelial alarmins in severe asthma (N=1,817)	**95%** relative gain in confidence across learning objectives (N=1,674)
	200% relative knowledge gain in matching clinical characteristics and phenotypes to treatment targets (N=1,817)	

Level (1) Outcomes: Participation (Degree)

Final Outcomes Summary – Online Enduring

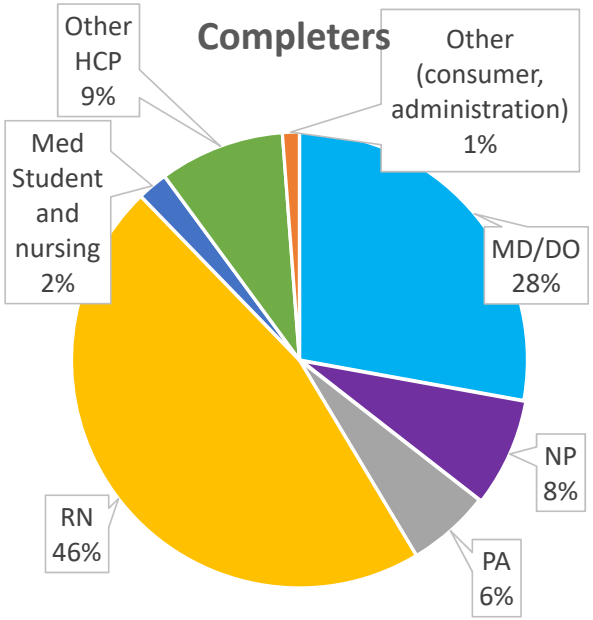
National Jewish Health

Degree	Total
MD/DO	2,030
NP	370
PA	247
RN	2,147
Other HCP	488
Other (consumer, administration)	87
Total Learners	**5,369**



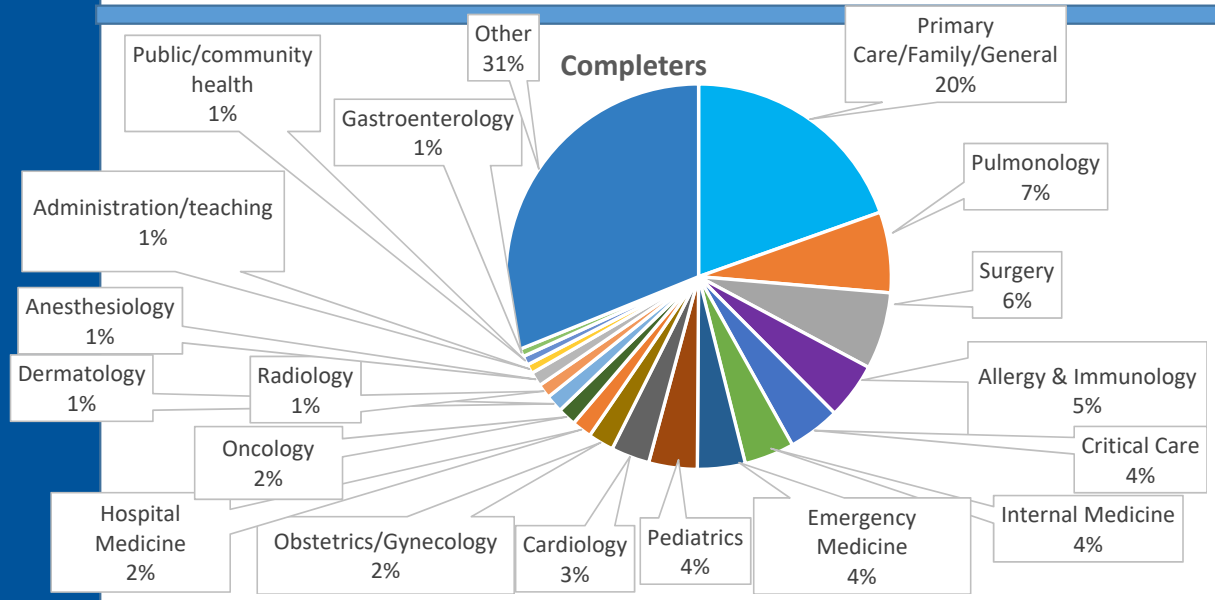
Degree	Total
MD/DO	464
NP	128
PA	98
RN	772
Medical and nursing students	36
Other HCP	151
Other (consumer, administration)	20
Total Completers	**1,669**

While nurses were not specifically targeted as an audience, a large number of nurses were organically drawn to this activity, suggesting a need for severe asthma education among registered nurses.



Level (1) Outcomes: Participation (Specialty)

Final Outcomes Summary – Online Enduring



Physician Learners by Specialty	Total	Percent of Physician Learners (N=2,030)	Percent of Total Learners (N=5,369)
Pulmonologists	990	49%	18%
Allergists & Clinical Immunologists	196	10%	4%
Primary Care Physicians	418	20%	8%
Other Physicians	426	21%	8%

While the target audience represents a small percentage of total completers, **59% of physician learners** were from the target audience of pulmonologists and allergists/immunologists!

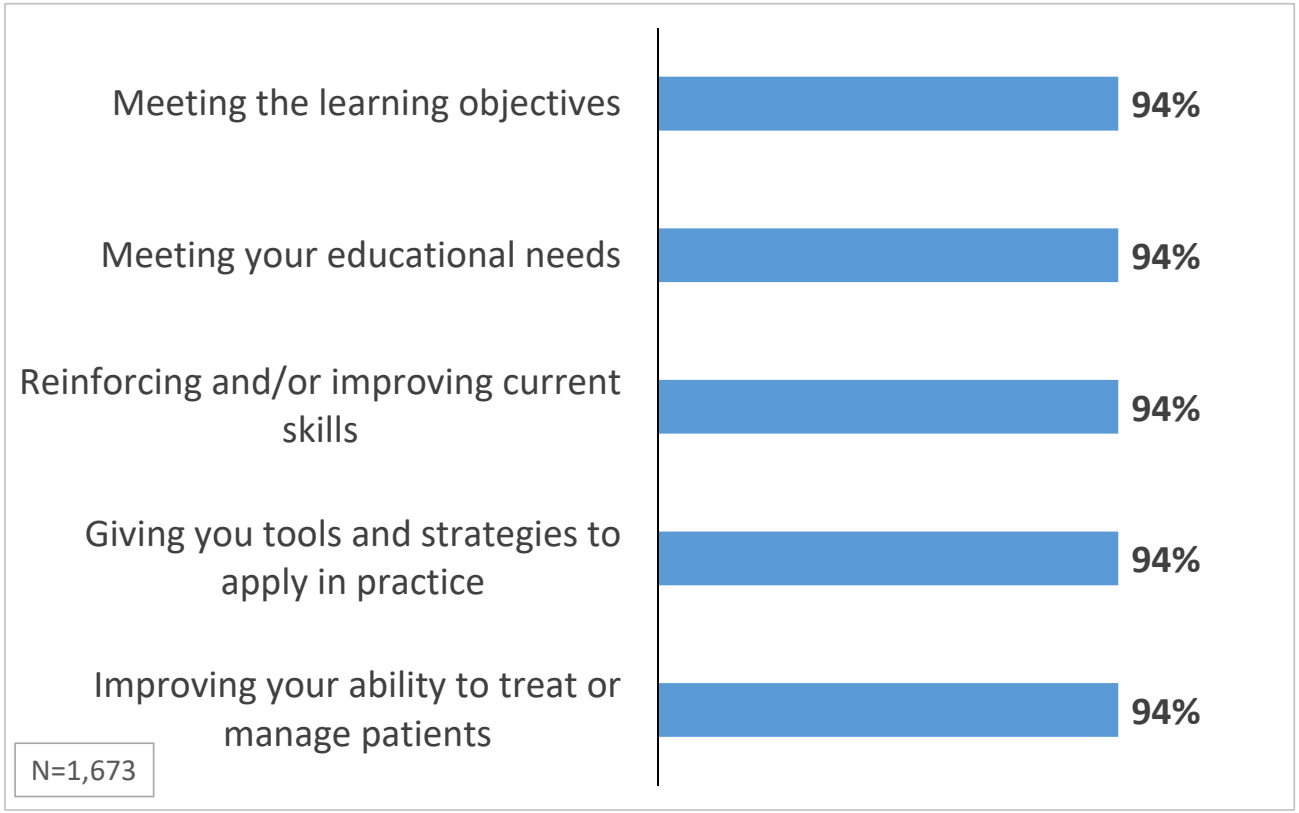
Specialty	Total
Primary Care/Family/ General	327
Pulmonology	113
Surgery	108
Pediatrics	68
Allergy & Immunology	79
Critical Care	73
Internal Medicine	70
Emergency Medicine	67
Cardiology	54
Obstetrics/Gynecology	36
Hospital Medicine	28
Oncology	26
Dermatology	23
Radiology	20
Anesthesiology	20
Administration/teaching	13
Public/community health	13
Gastroenterology	11
Other (Pain management, infectious disease, otolaryngology, not specified & more)	520
Total Completers	**1,669**

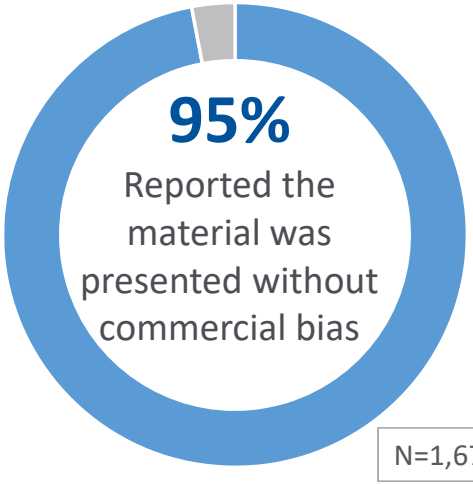
Level (2) Outcomes: Satisfaction

Final Outcomes Summary – Online Enduring

National Jewish Health

Evaluation respondents report the activity was "Excellent" to "Good" at:





Level (3 & 4) Outcomes: Knowledge & Competence

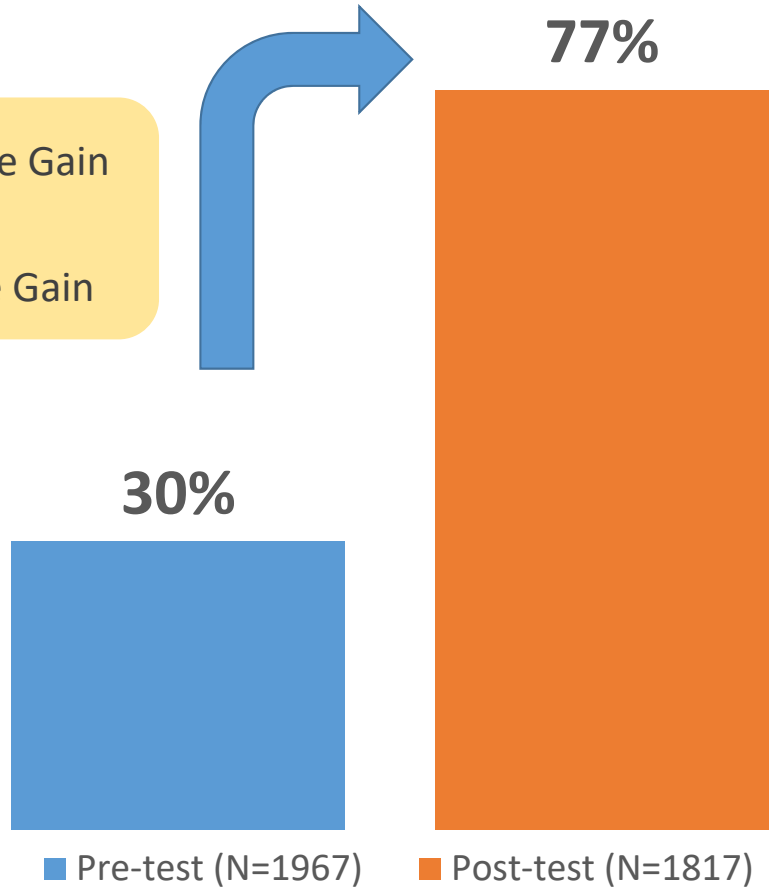
National Jewish Health

Interim Outcomes Summary – Q4 Online Outcomes

Overall Knowledge Gain across Learning Objectives

157% Relative Knowledge Gain

47% Absolute Knowledge Gain



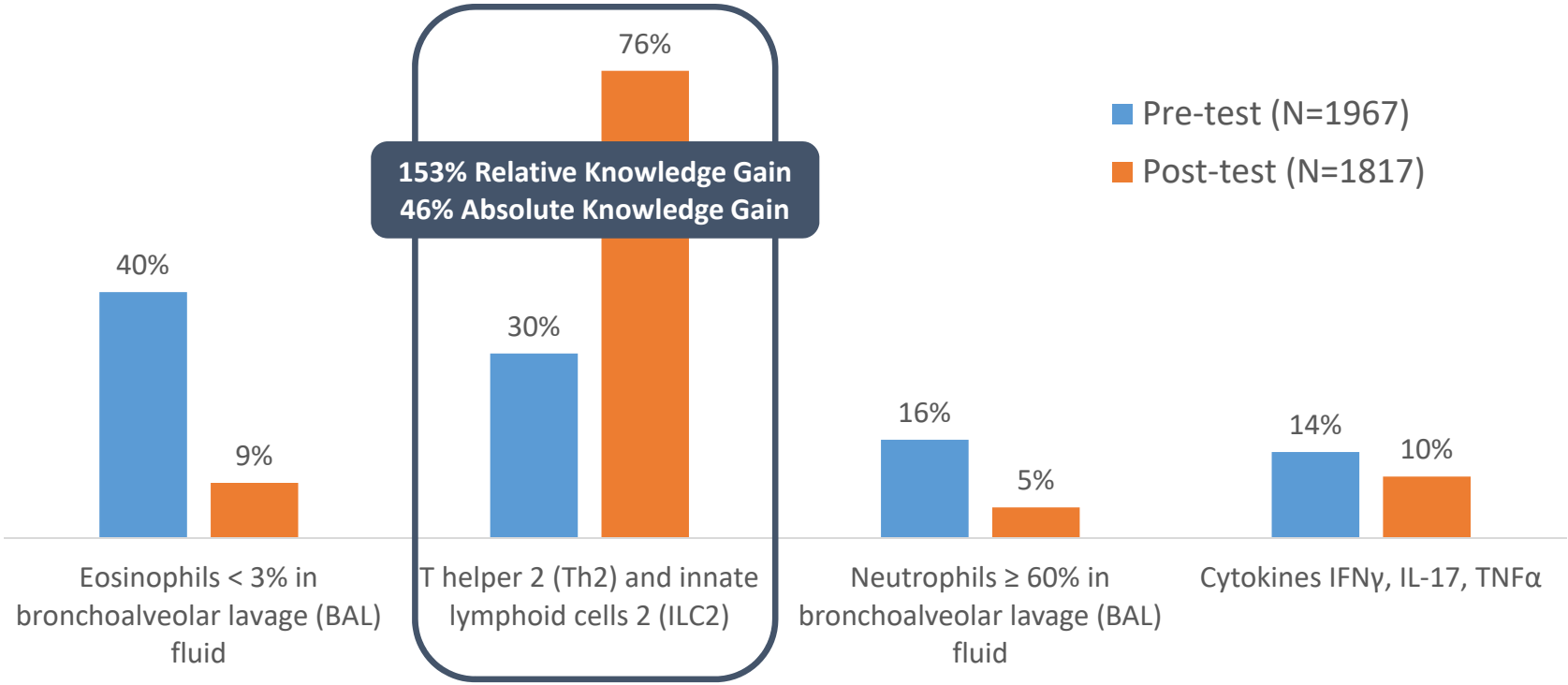
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Enduring

Learning Objective: *Define the epithelial alarmins and their impact on T2 and non-T2 airway inflammation, remodeling, and hyperresponsiveness in severe asthma.*

Question 1: Type 2 inflammation can be characterized by:



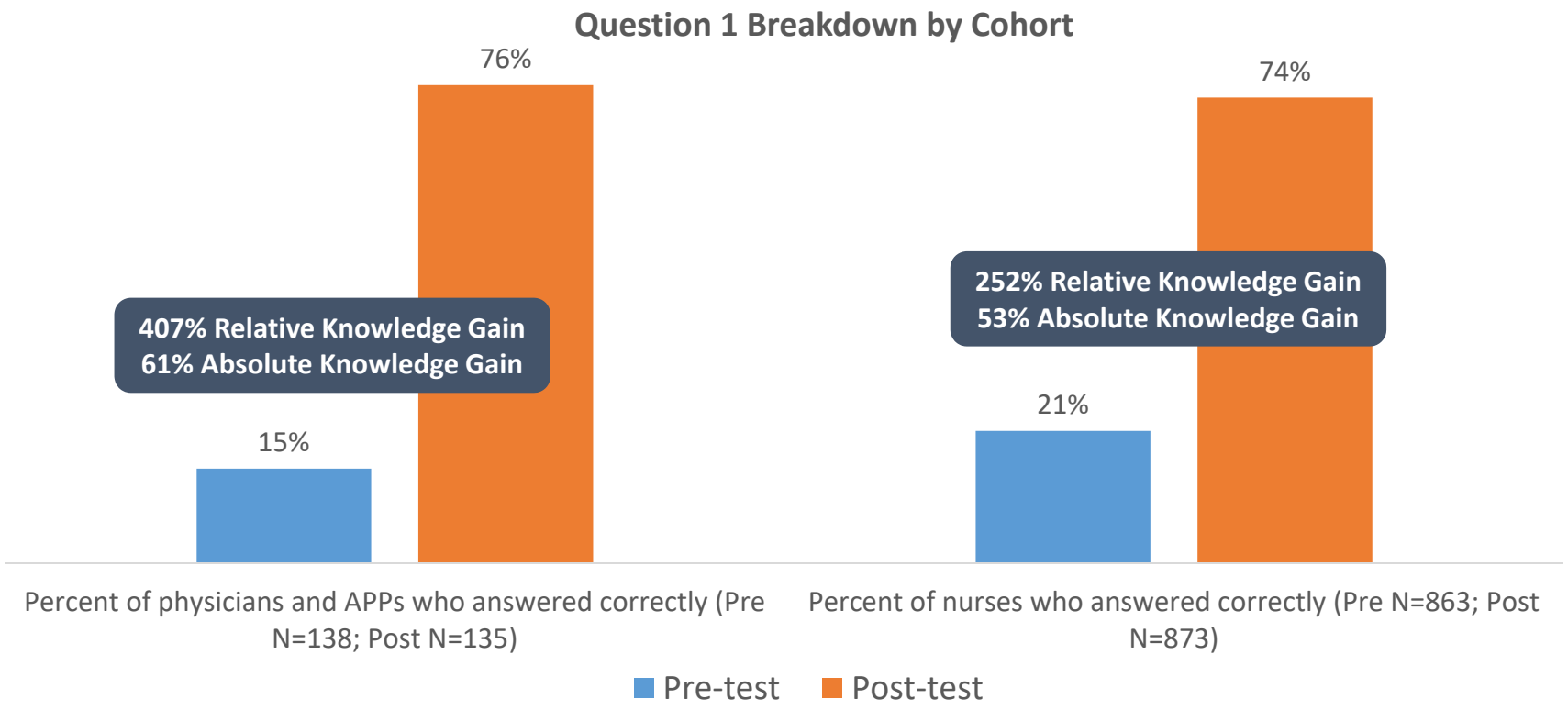
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Enduring

Learning Objective: *Define the epithelial alarmins and their impact on T2 and non-T2 airway inflammation, remodeling, and hyperresponsiveness in severe asthma.*

Question 1: Type 2 inflammation can be characterized by:



Level (3 & 4) Outcomes: Knowledge & Competence

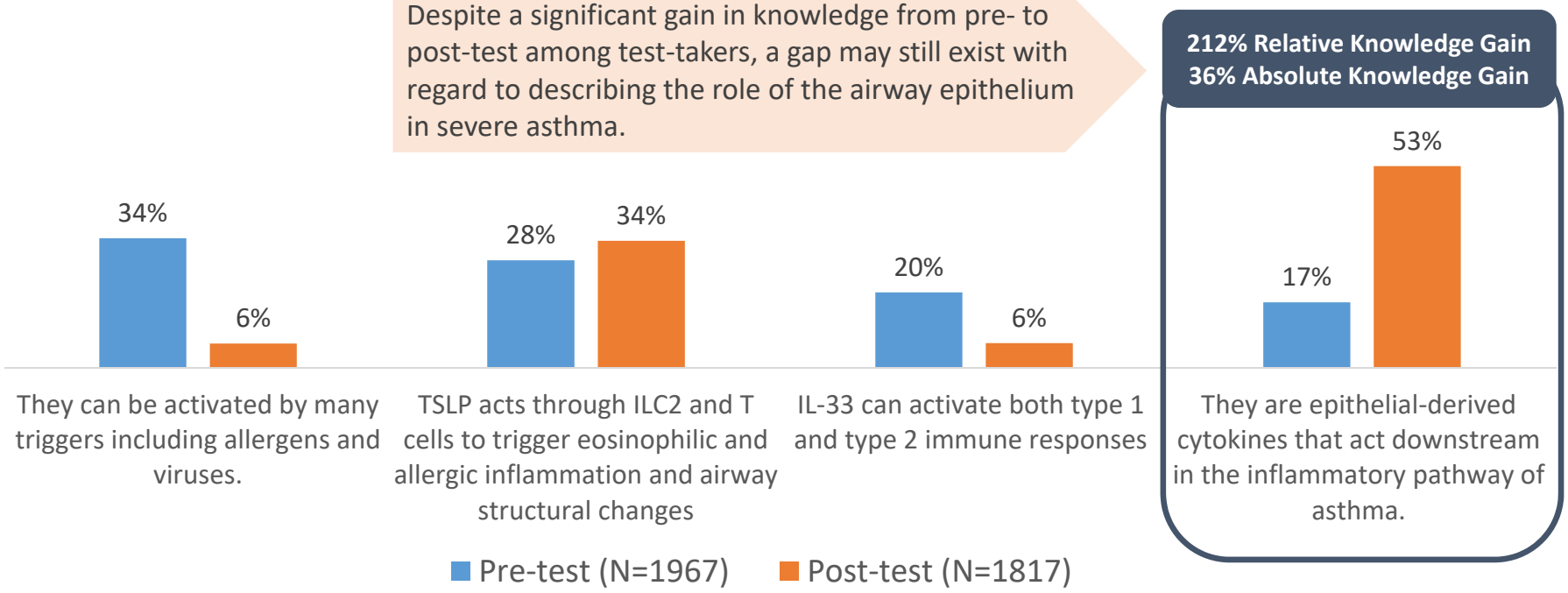
National Jewish Health

Final Outcomes Summary – Online Enduring

***Learning Objective**: Describe the role of the respiratory epithelium in asthma development and progression.*

Question 2: Which of the following is not true about epithelial alarmins?

Despite a significant gain in knowledge from pre- to post-test among test-takers, a gap may still exist with regard to describing the role of the airway epithelium in severe asthma.



212% Relative Knowledge Gain
36% Absolute Knowledge Gain

Level (3 & 4) Outcomes: Knowledge & Competence

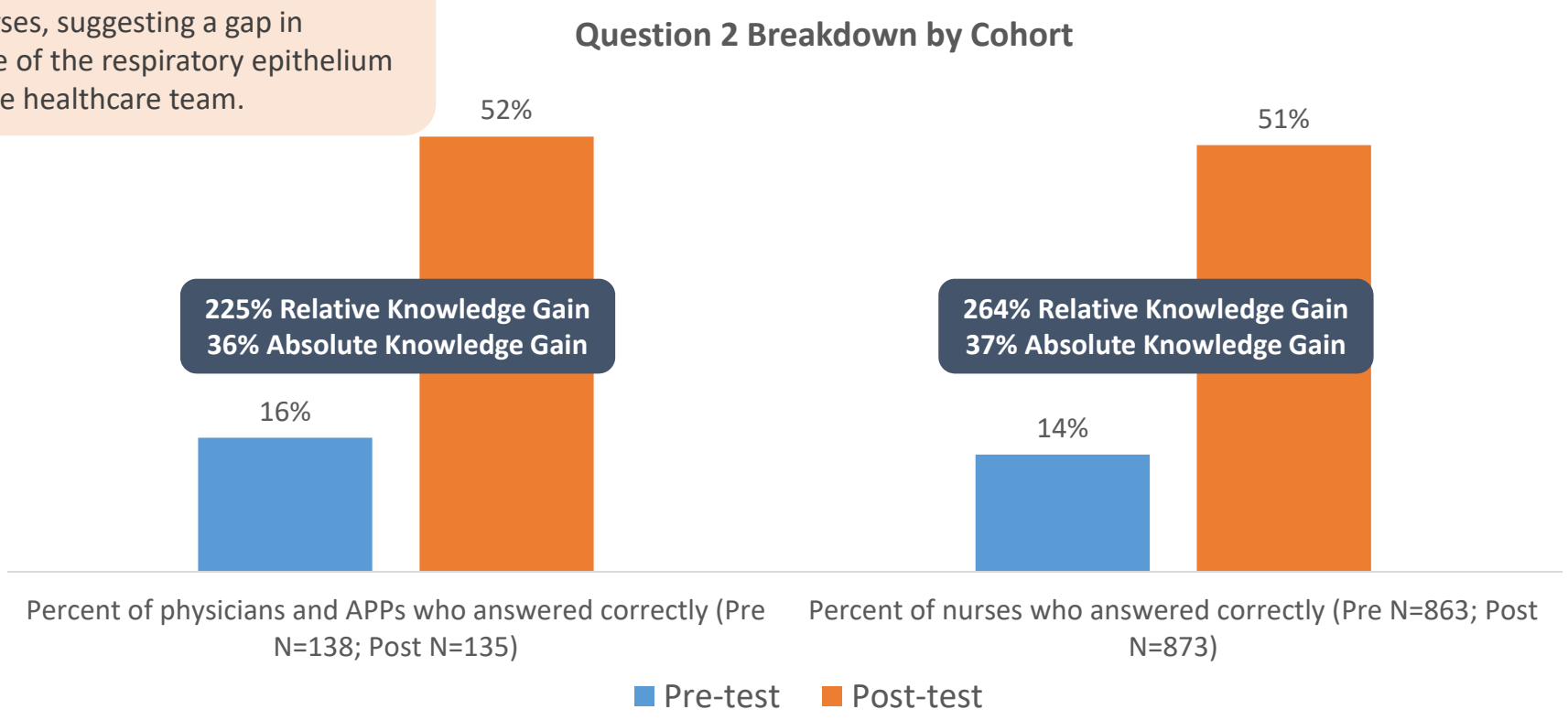
Final Outcomes Summary – Online Enduring

National Jewish Health

Learning Objective: *Describe the role of the respiratory epithelium in asthma development and progression.*

Question 2: Which of the following is not true about epithelial alarmins?

Post-test performance was comparable among physicians, APPs, and nurses, suggesting a gap in knowledge about the role of the respiratory epithelium among all members of the healthcare team.



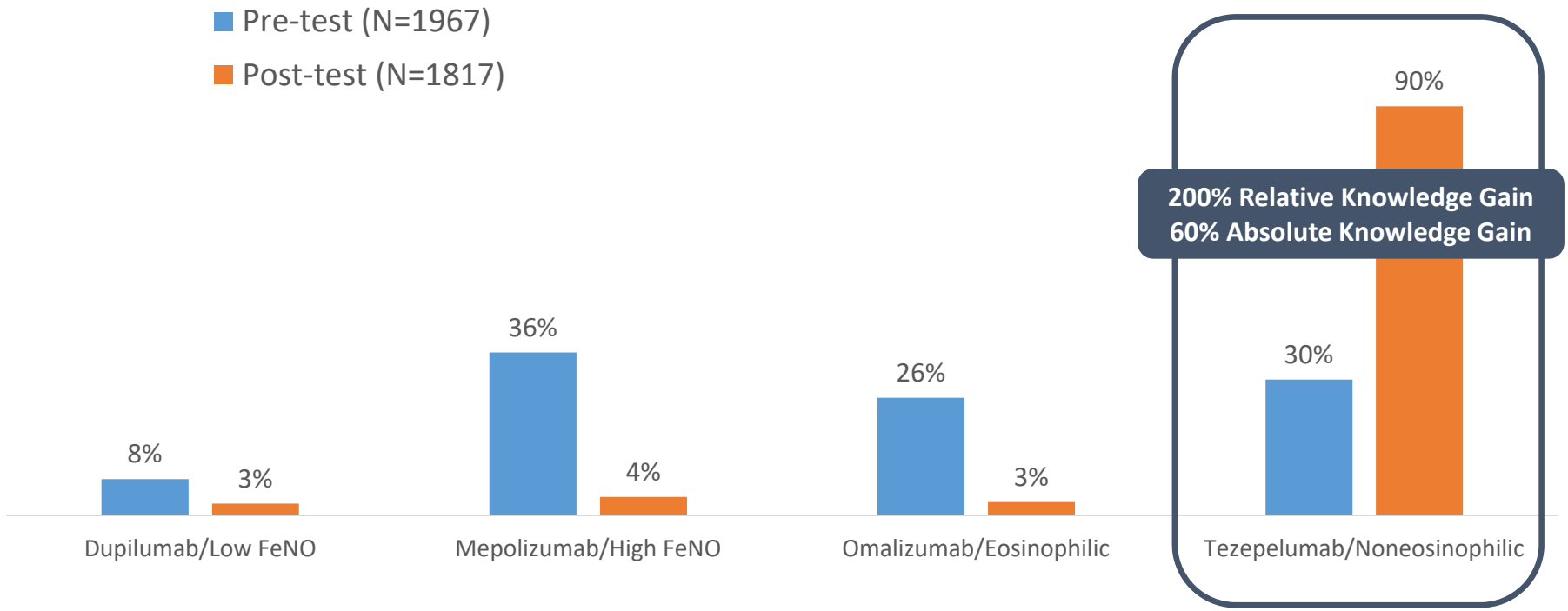
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Online Enduring

National Jewish Health

Learning Objective: *Match clinical characteristics and phenotypes to treatment targets*

Question 3: Which of the following treatment options consistently matches to clinical response with the corresponding phenotype?



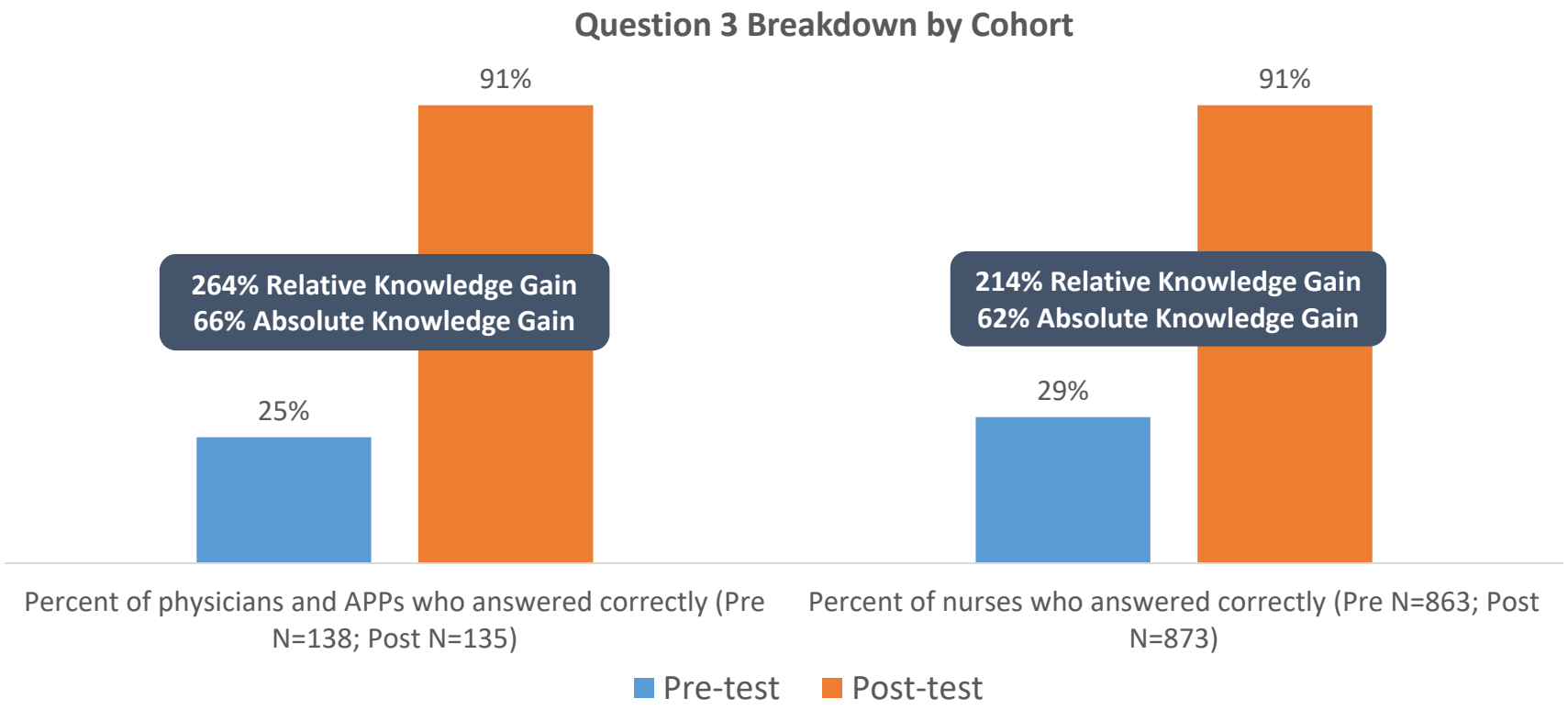
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Enduring

Learning Objective: *Match clinical characteristics and phenotypes to treatment targets*

Question 3: Which of the following treatment options consistently matches to clinical response with the corresponding phenotype?



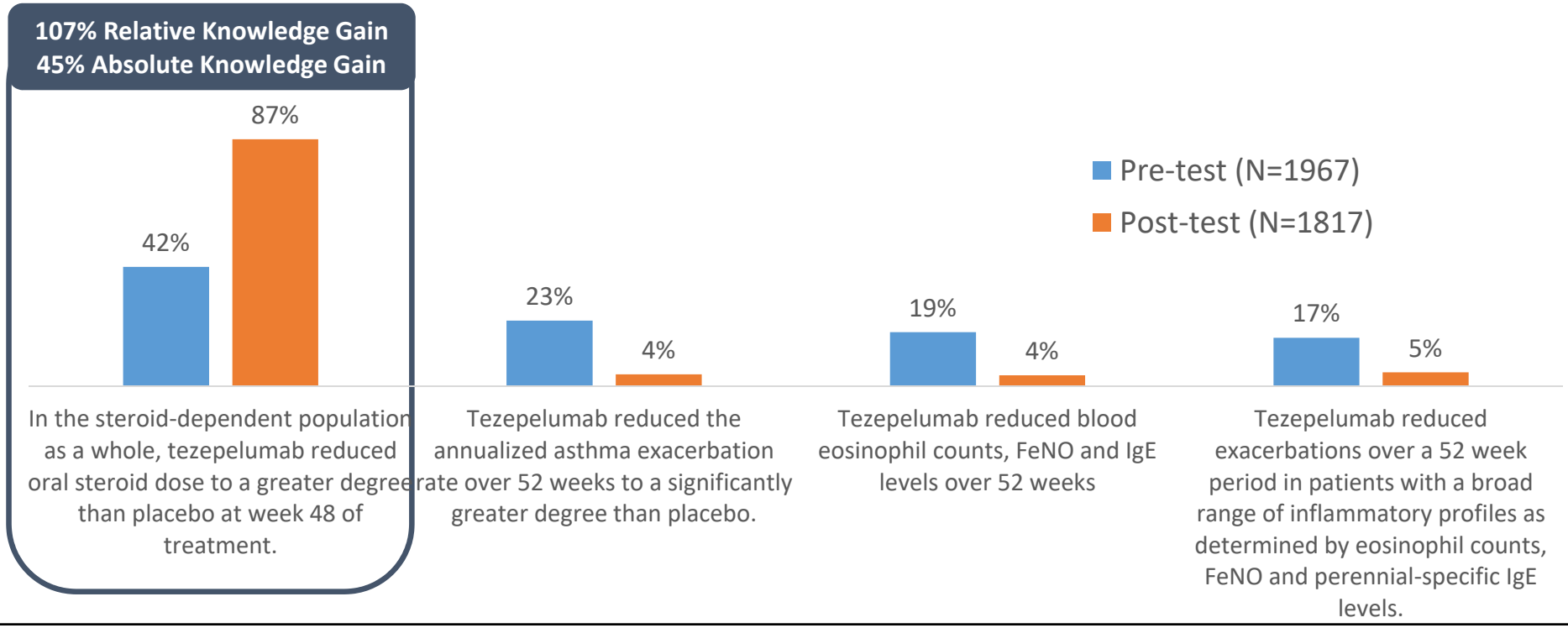
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Enduring

Learning Objectives: *Evaluate the results of clinical trials of emerging therapies that target the epithelial alarmins in severe asthma.*

Question 4: In the phase 3 tezepelumab (anti-TSLP) trials NAVIGATOR and SOURCE, which of the following was NOT demonstrated?



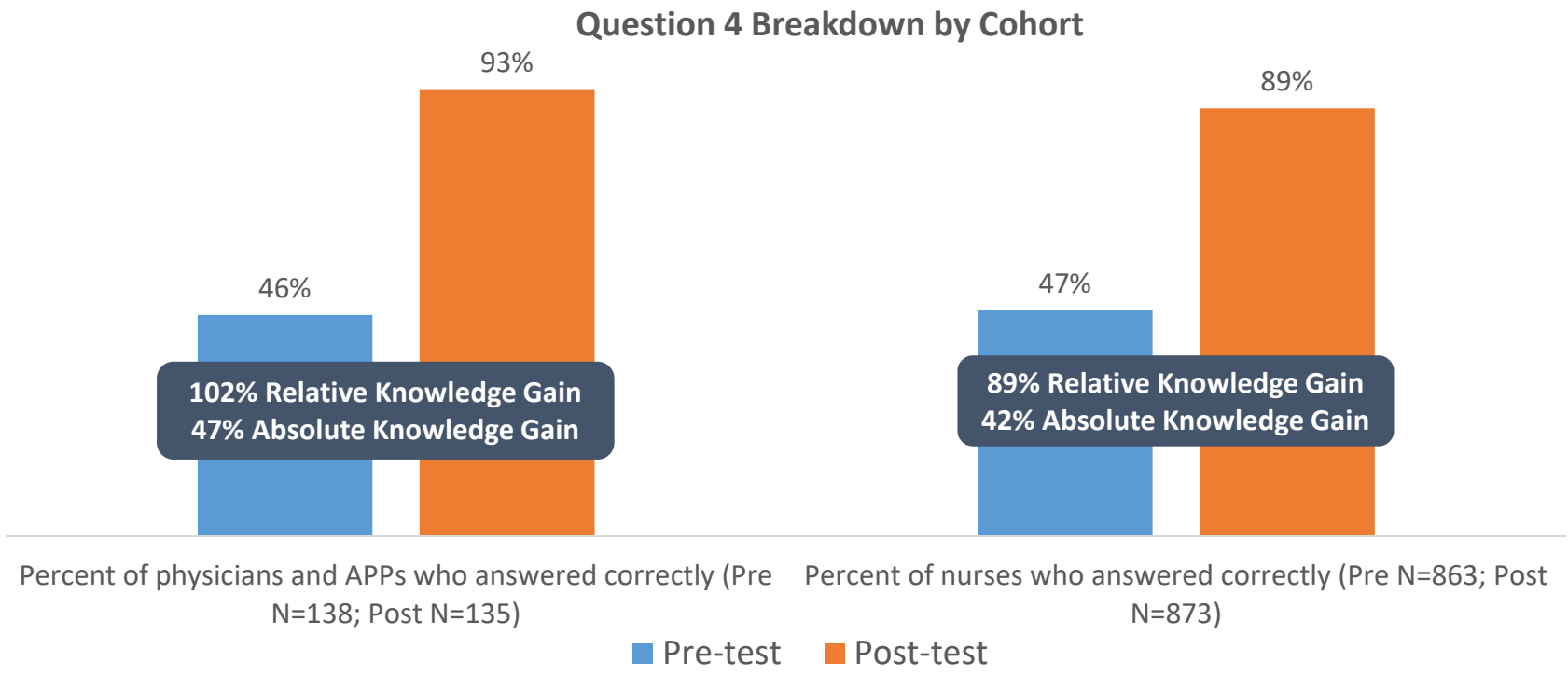
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Enduring

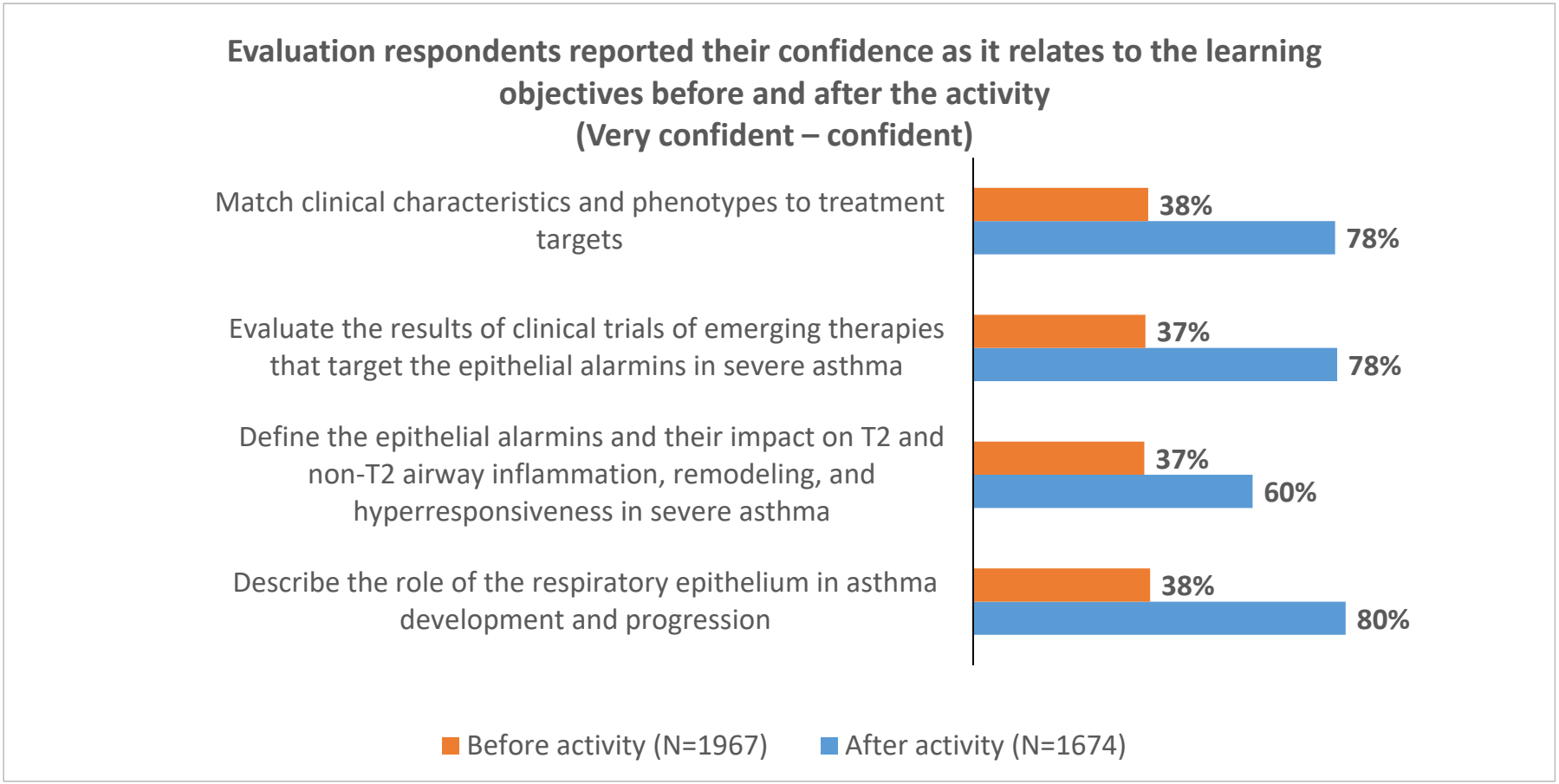
Learning Objective: *Evaluate the results of clinical trials of emerging therapies that target the epithelial alarmins in severe asthma.*

Question 4: In the phase 3 tezepelumab (anti-TSLP) trials NAVIGATOR and SOURCE, which of the following was NOT demonstrated?



Level (4) Outcomes: Competence

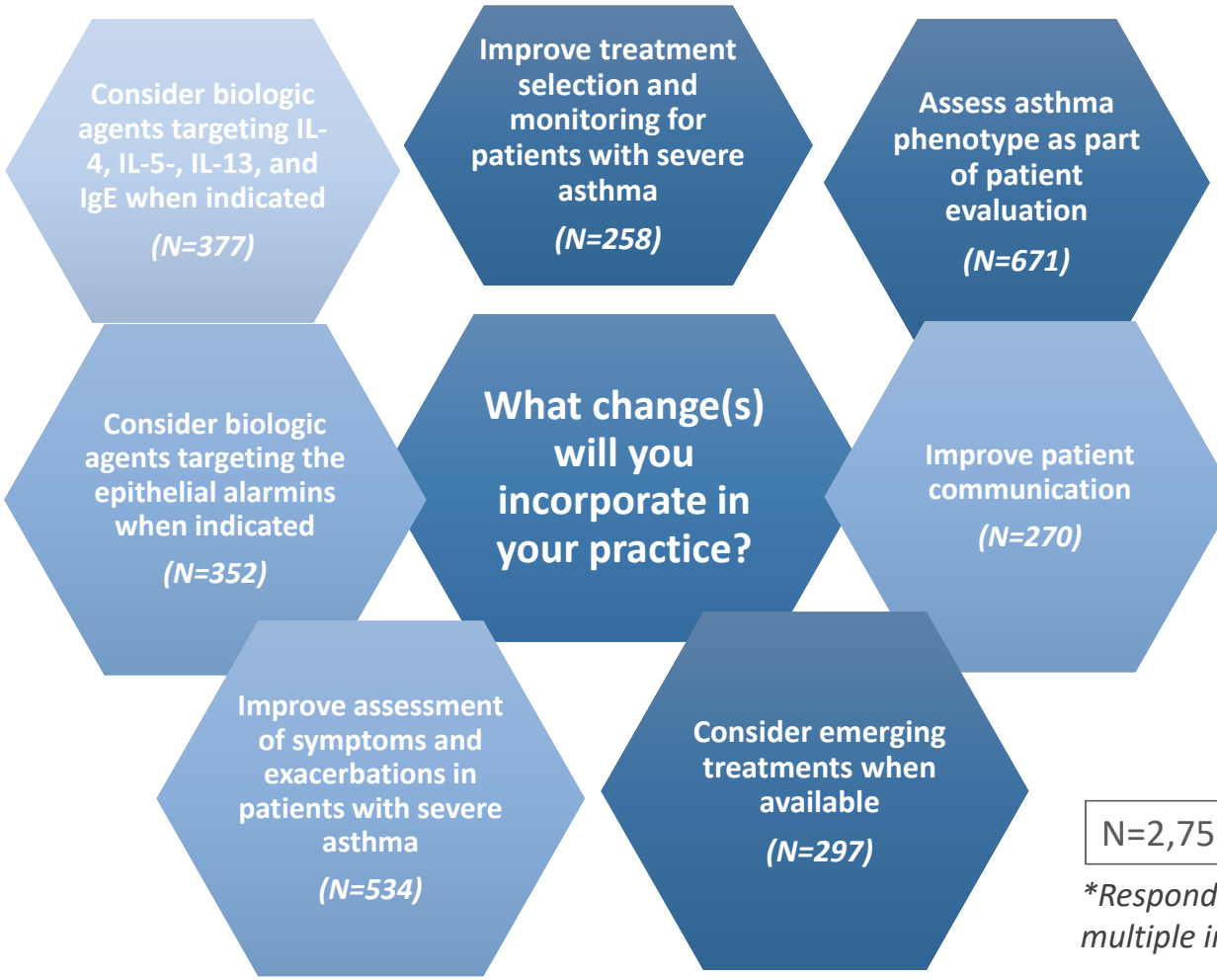
Final Outcomes Summary – Online Enduring



Level (4) Outcomes: Competence

Final Outcomes Summary – Online Enduring

National Jewish Health



91%

N=1,673

Evaluation respondents intend to make changes in practice as a result of the activity

N=2,759*

**Respondents were able to report multiple intended changes.*

Evaluation Survey Results

Final Outcomes Summary – Online Enduring

National Jewish Health

Key Takeaways

- Type 2 inflammation plays an important role in asthma
- More knowledge about severe asthma and its pathophysiology
- Role of alarmins in asthma
- Characterization of different phenotypes/endotypes of asthma and appropriate use of specific biologics
- Differences between T2 high and T2 low and their prognosis
- Better understanding of IL molecules
- Severe asthma needs a personalized treatment strategy
- Improve the quality of patient care
- Prompt diagnosis and treatment reduce mortality rate
- Improve patient monitoring
- Optimization of care for the patient
- Potential for use of biologics that are tailored to particular patient phenotypes
- Learning about different therapies aside from what the standard is at your own facility

Future Topics

- Asthma with obesity
- Heterogeneity of patients with severe asthma
- Prevention of exacerbations
- Relationship between severe asthma and environmental toxins
- Role of bronchial thermoplasty in conjunction with targeted treatment
- Severe asthma in pediatrics
- EGPA Treatment
- Non-eosinophilic asthma
- New medication options
- Monoclonals and their adverse effects
- More on use of biologics in asthma

"This activity helped improve assessment of symptoms and exacerbations in patients with severe asthma ."

– Online enduring learner

Live Activities: National Webinars and Grand Rounds

Final Outcomes Summary – Live Broadcasts and Grand Rounds

Live Broadcasts

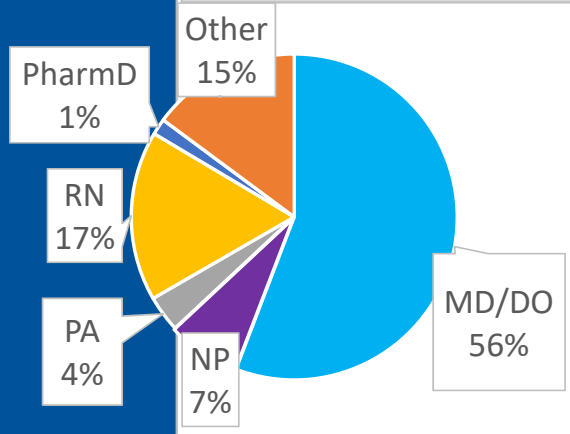
Location	Date	Participation
National Jewish Health Live National Webinar	May 24, 2022	26 Learners
Medscape Live National Webinar	July 19, 2022	133 Learners
University of North Carolina (UNC) Grand Rounds	August 10, 2022	19 Learners
Oregon Health & Science University (OHSU) Grand Rounds	September 20, 2022	13 Learners
University of Rochester Medical Center (URMC) Grand Rounds	November 17, 2022	17 Learners
Mt. Sinai Grand Rounds	December 9, 2022	41 Learners
Total Live Broadcast Learners		**249**

Educational Impact Summary

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health

Participation

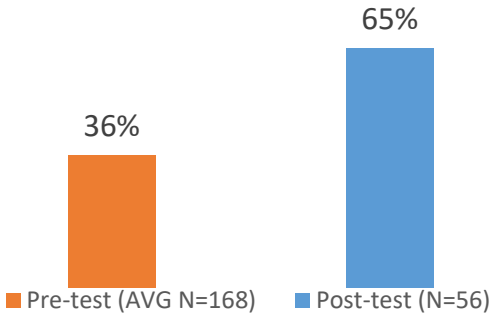


MD/DO=139
NP=18
PA=9
RN=42
PharmD=4
Other=37
Total Learners: 249

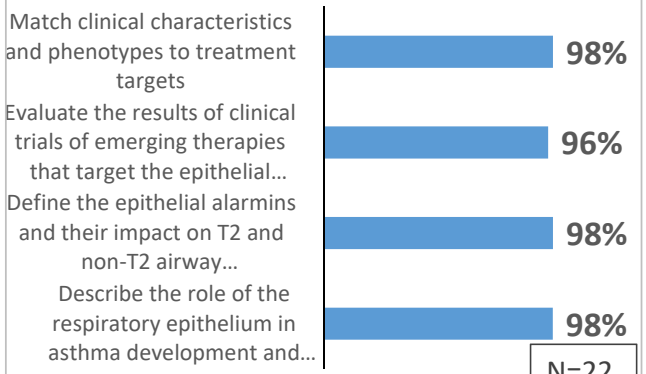
Learner Guarantee	Learner Actuals
220	**249**

Exceeded total live learner guarantee by 13%!

81% relative gain in knowledge
29% absolute gain in knowledge



Post-activity confidence



Evaluation N=22

Met their educational needs **(100%)**

Reinforced or improved current skills **(100%)**

Improved ability to treat patients **(100%)**

96% Evaluation respondents intend to make changes to practice as a result of the activity

Educational Impact Summary

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health®

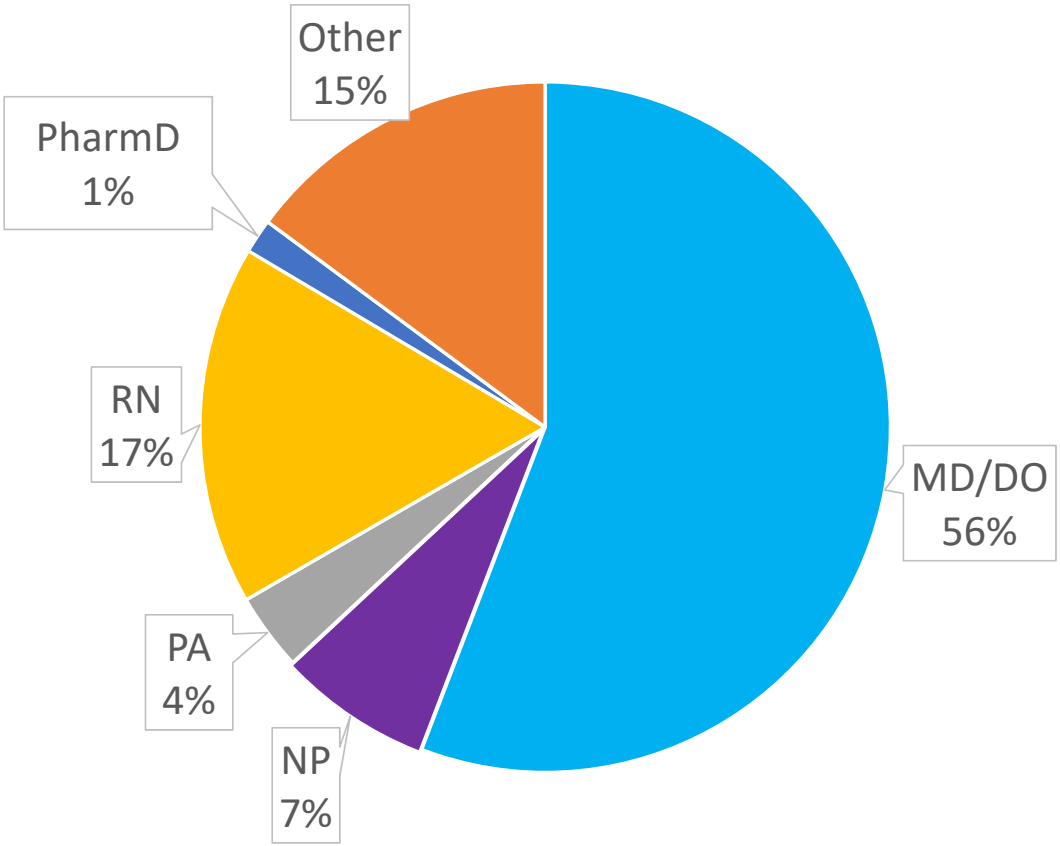
Patient Impact	Educational Impact	Practice Change
19 evaluation respondents	**103%** relative knowledge gain seen from learners in defining the epithelial alarmins and their impact on T2 and non-T2 airway inflammation, remodeling, and hyperresponsiveness in severe asthma (N=56)	**96%** intend to make changes in practice as a result of what they learned (N=22)
Who see **162** total severe asthma patients weekly	**50%** relative knowledge gain in describing the role of the respiratory epithelium in asthma development and progression (N=56)	**100%** indicated the activity gave tools and strategies to apply in practice (N=22)
Which translates to **8,424** potential patient visits impacted annually	**103%** relative knowledge gain seen in evaluating the results of clinical trials of emerging therapies that target the epithelial alarmins in severe asthma (N=56)	
	73% relative knowledge gain in matching clinical characteristics and phenotypes to treatment targets (N=56)	

"Thank you for the awesome mechanistic review!" – *Grand Rounds participant*

Level (1) Outcomes: Participation (Degree)

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health

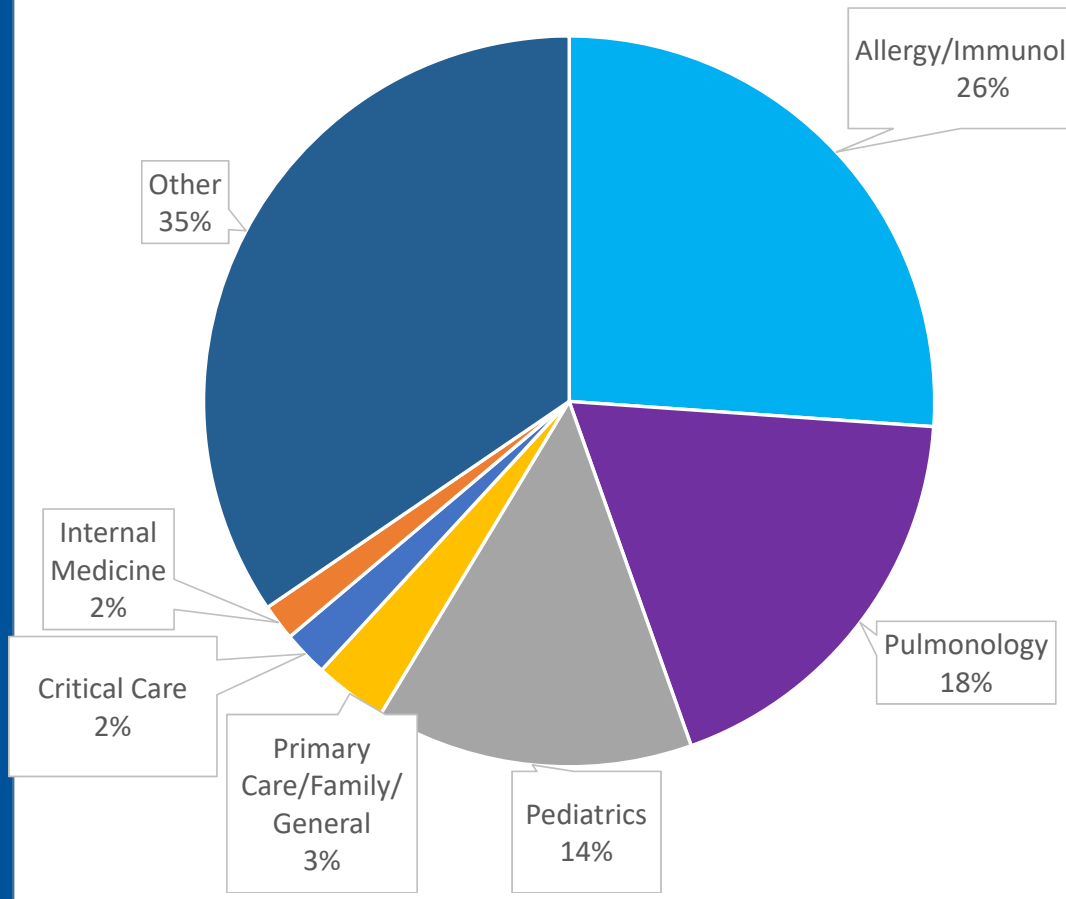


Degree	Total
MD/DO	139
NP	18
PA	9
RN	42
PharmD	4
Other	37
TOTAL	**249**

Level (1) Outcomes: Participation (Specialty)

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health



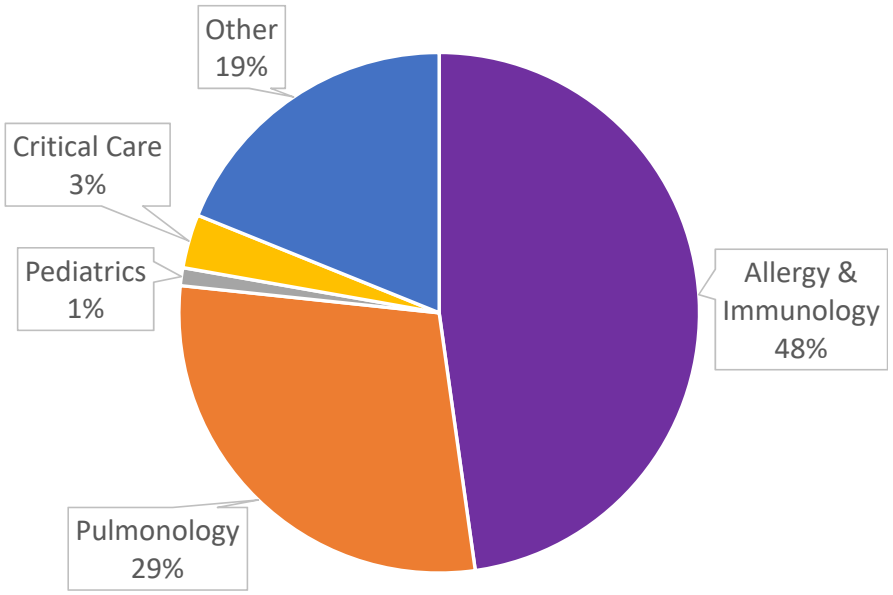
Specialty	Total
Allergy/Immunology	65
Pulmonology	46
Pediatrics	35
Primary Care/Family/ General Practice	8
Critical Care	5
Internal Medicine	4
Other	86
TOTAL	**249**

Level (1) Outcomes: Participation (Specialty)

Final Outcomes Summary – Live Broadcasts and Grand Rounds

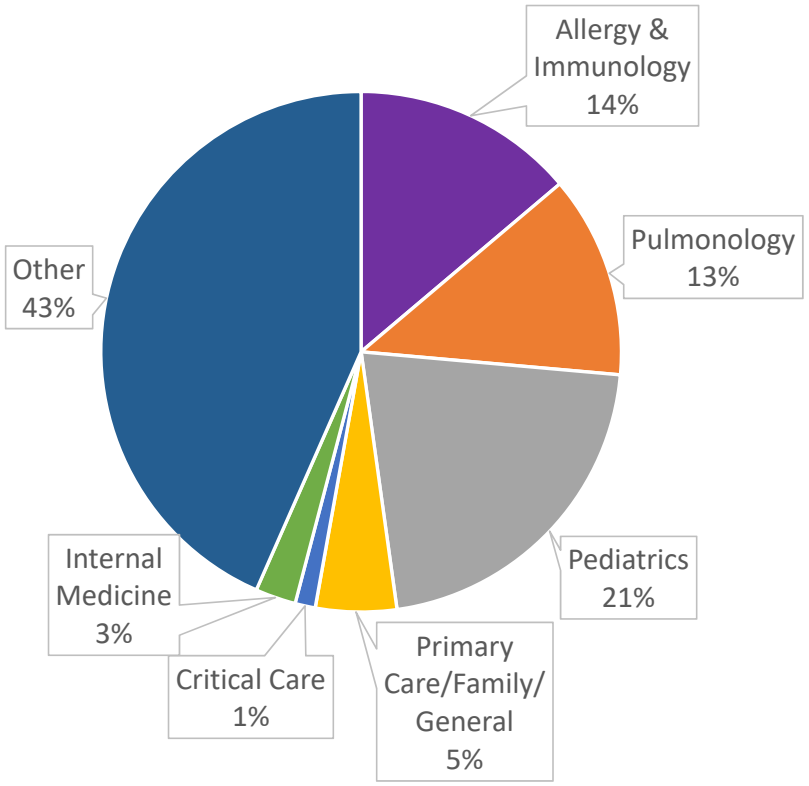
National Jewish Health

Grand Rounds



N=90

National Webinars



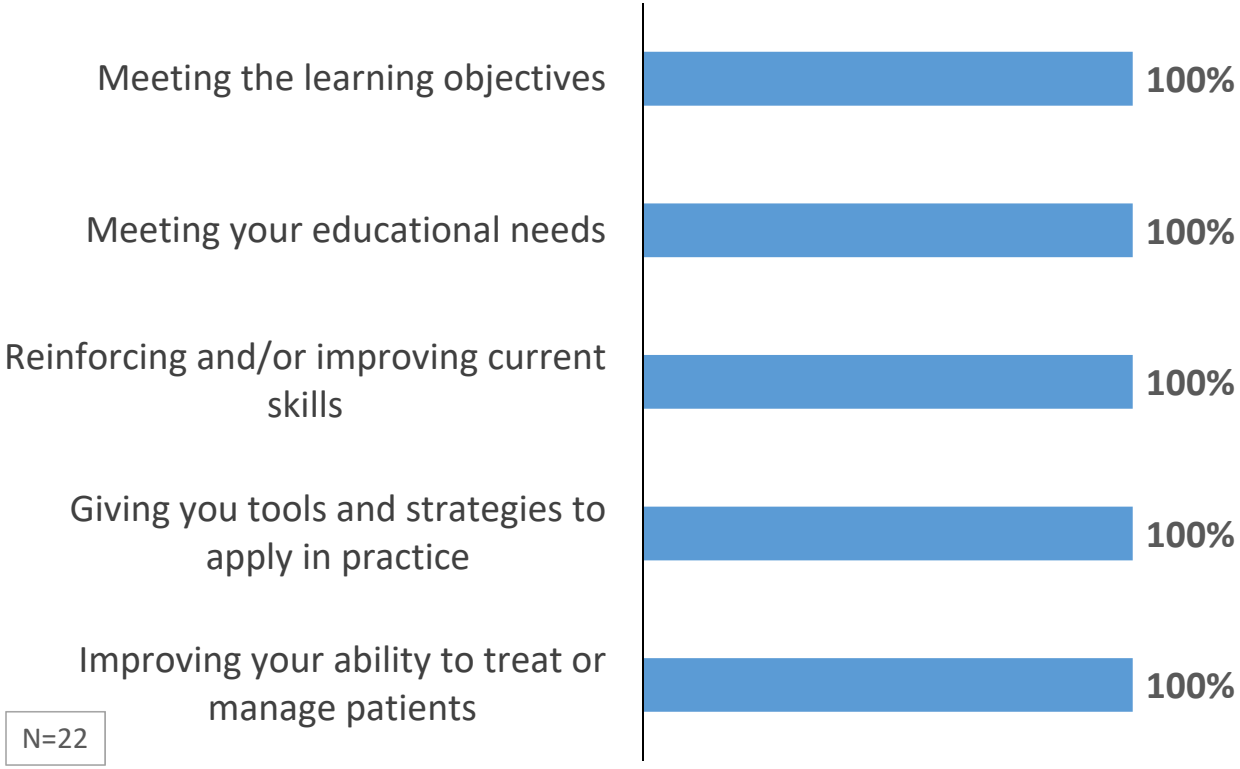
N=159

Level (2) Outcomes: Satisfaction

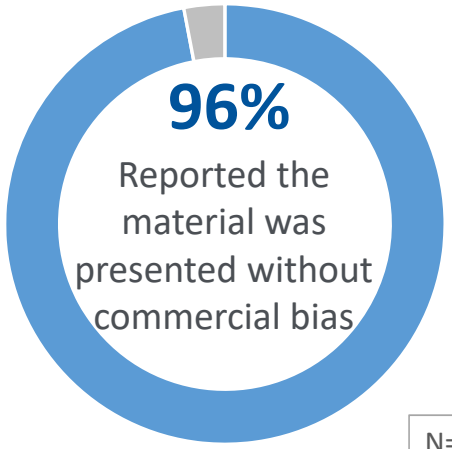
Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health

Participants report the activity was "Excellent" to "Good" at:



N=22



N=22

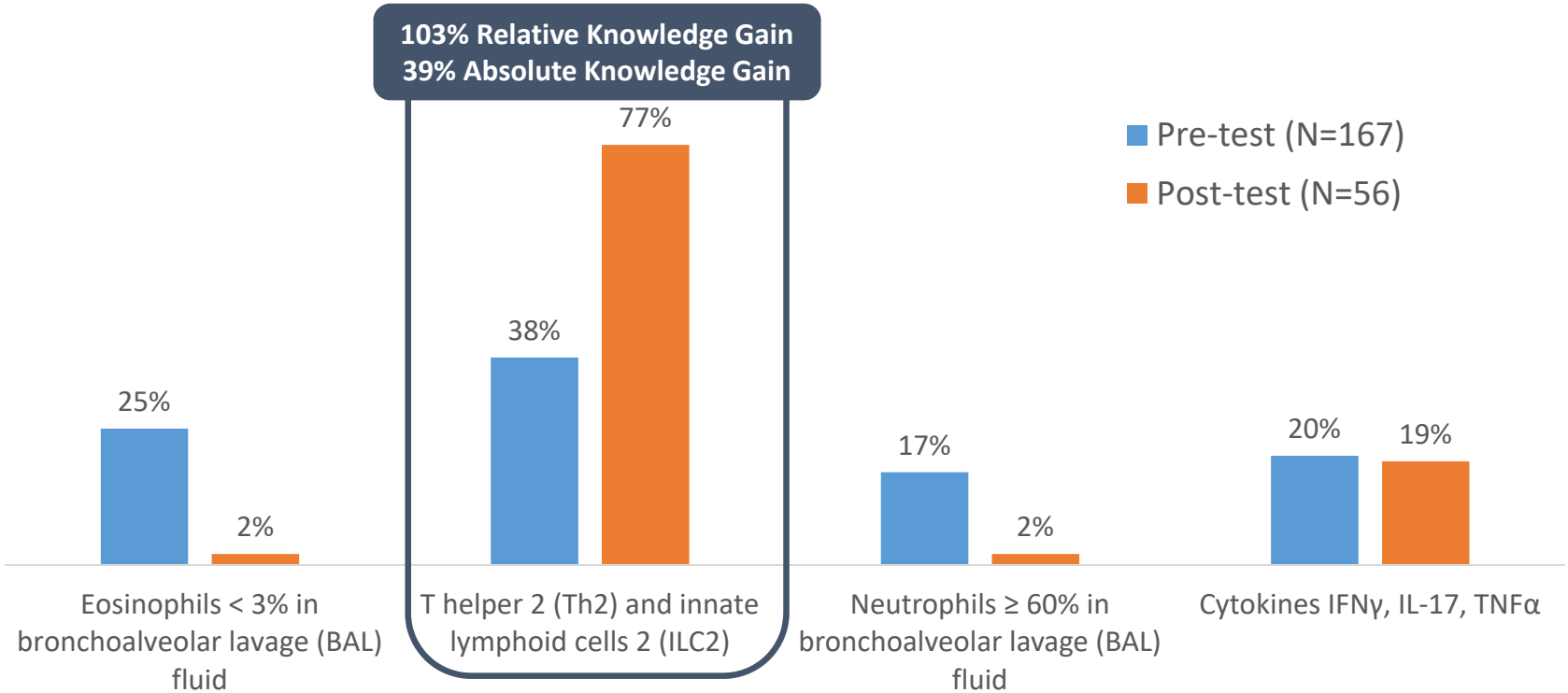
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Live Broadcasts and Grand Rounds

Learning Objective: *Define the epithelial alarmins and their impact on T2 and non-T2 airway inflammation, remodeling, and hyperresponsiveness in severe asthma.*

Question 1: Type 2 inflammation can be characterized by:



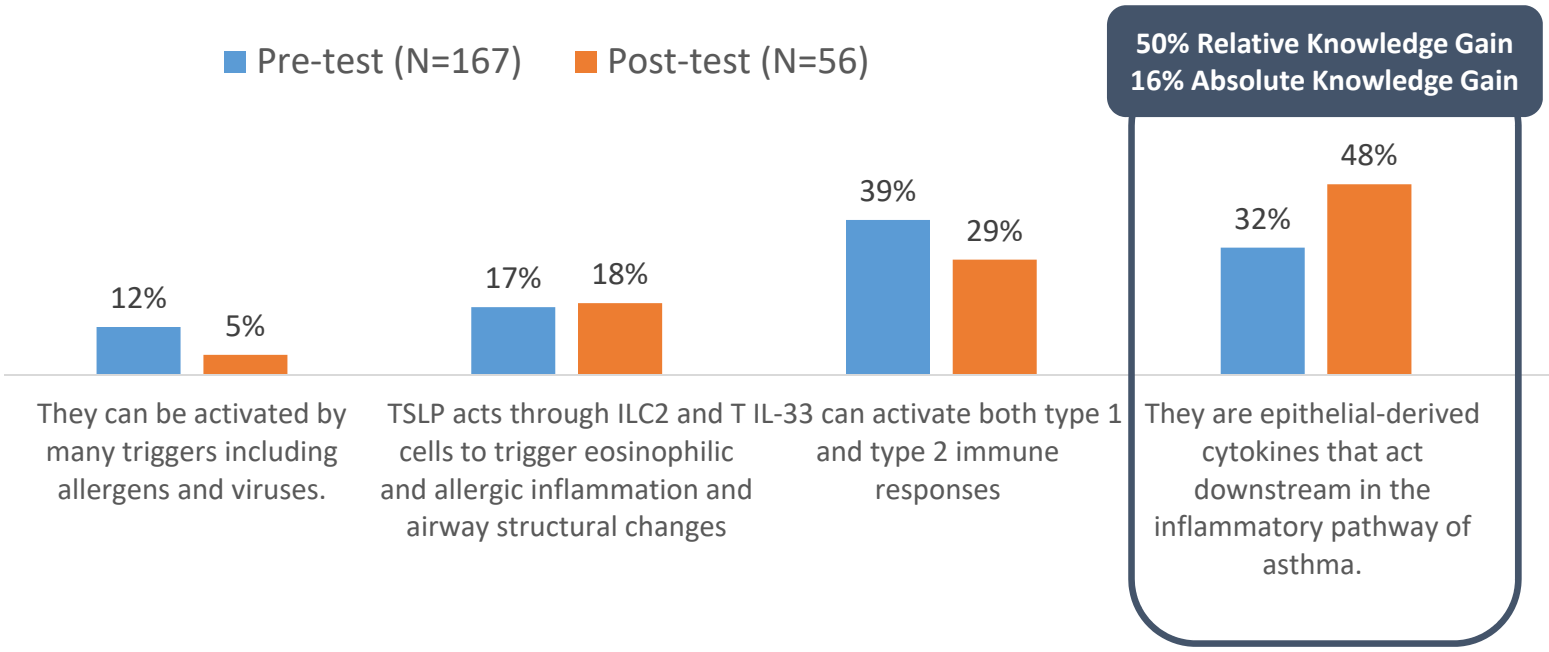
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Live Broadcasts and Grand Rounds

***Learning Objective**: Describe the role of the respiratory epithelium in asthma development and progression.*

Question 2: Which of the following is not true about epithelial alarmins?



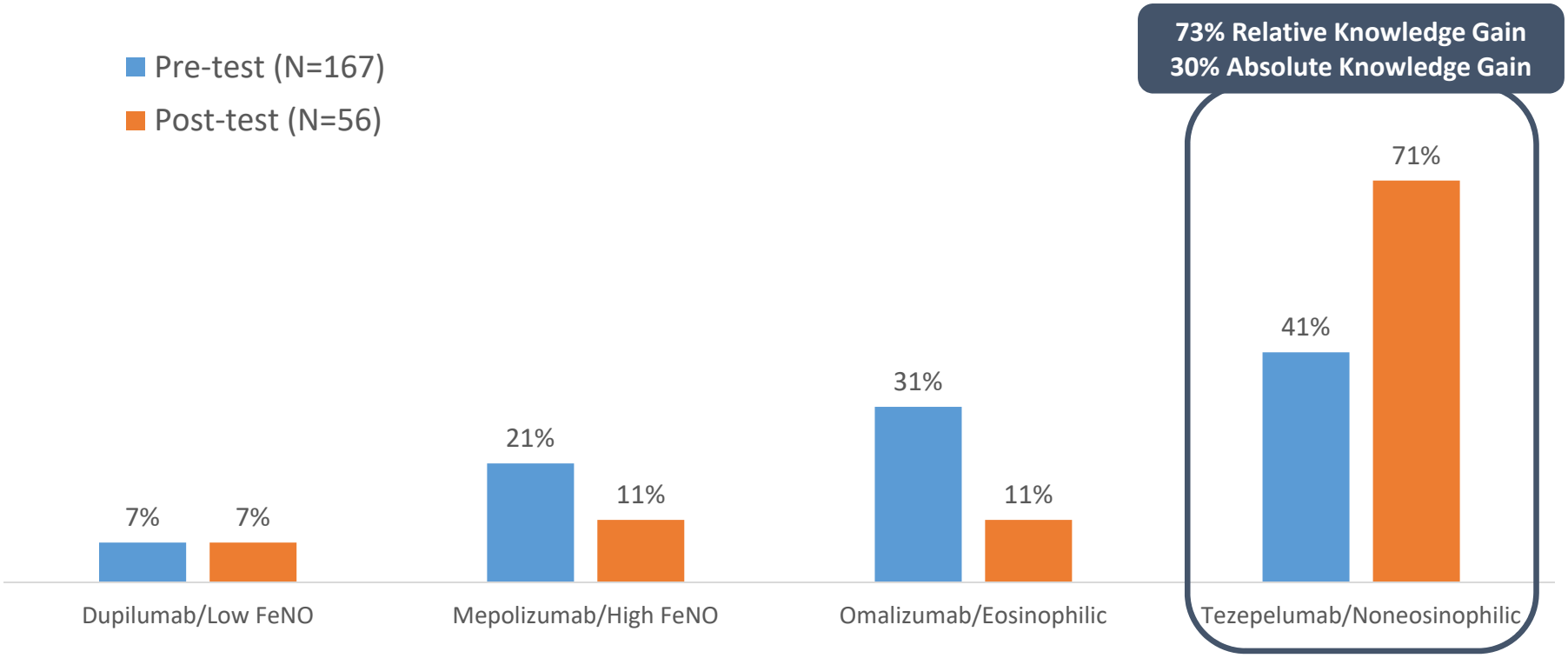
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Live Broadcasts and Grand Rounds

Learning Objective: *Match clinical characteristics and phenotypes to treatment targets*

Question 3: Which of the following treatment options consistently matches to clinical response with the corresponding phenotype?



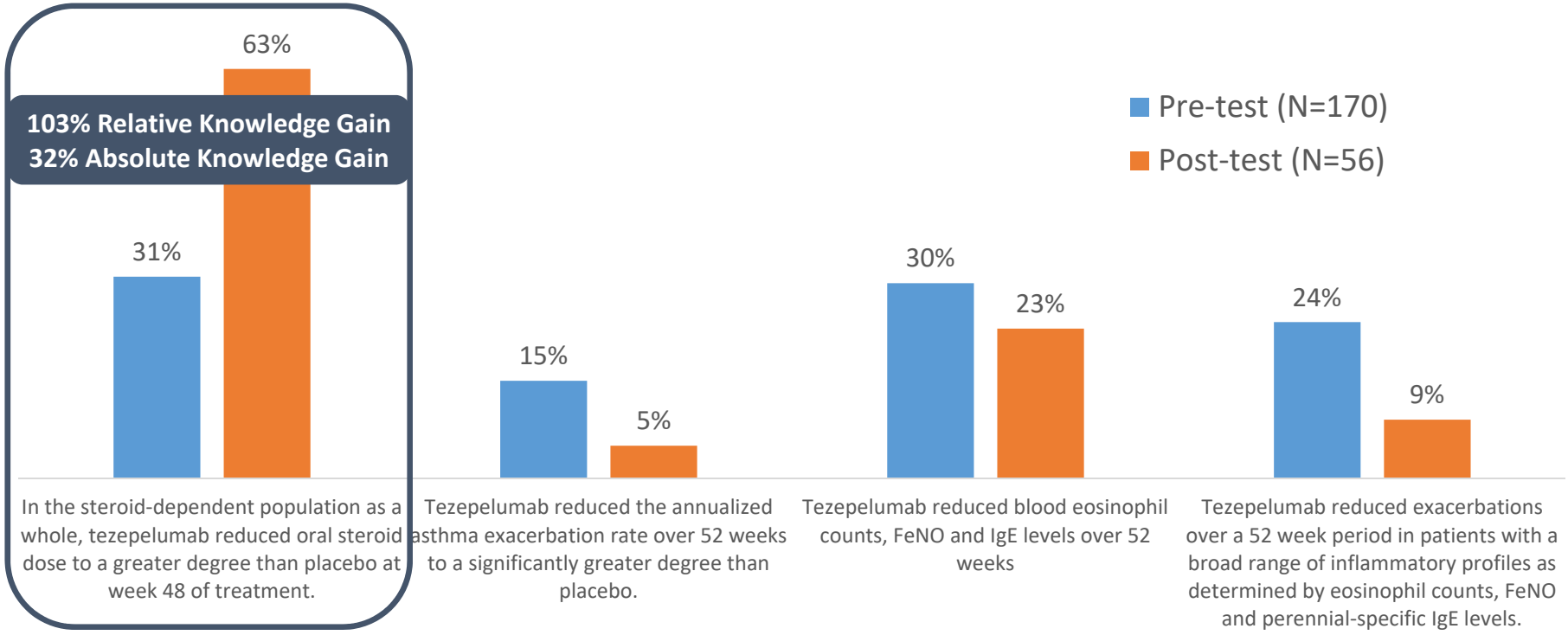
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Live Broadcasts and Grand Rounds

Learning Objectives: Evaluate the results of clinical trials of emerging therapies that target the epithelial alarmins in severe asthma.

Question 4: In the phase 3 tezepelumab (anti-TSLP) trials NAVIGATOR and SOURCE, which of the following was NOT demonstrated?



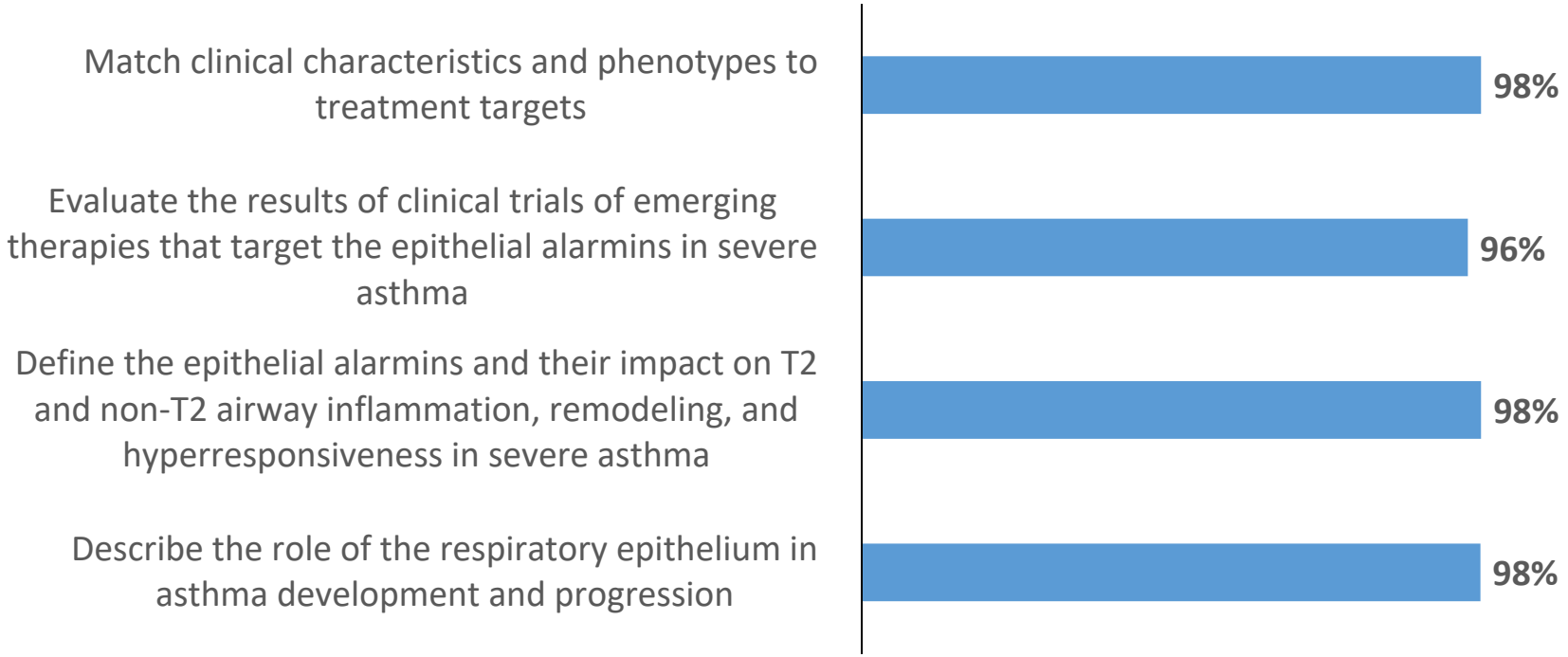
Level (4) Outcomes: Competence

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health

Evaluation respondents reported their confidence as it relates to the learning objectives after the activity (Very confident – confident)

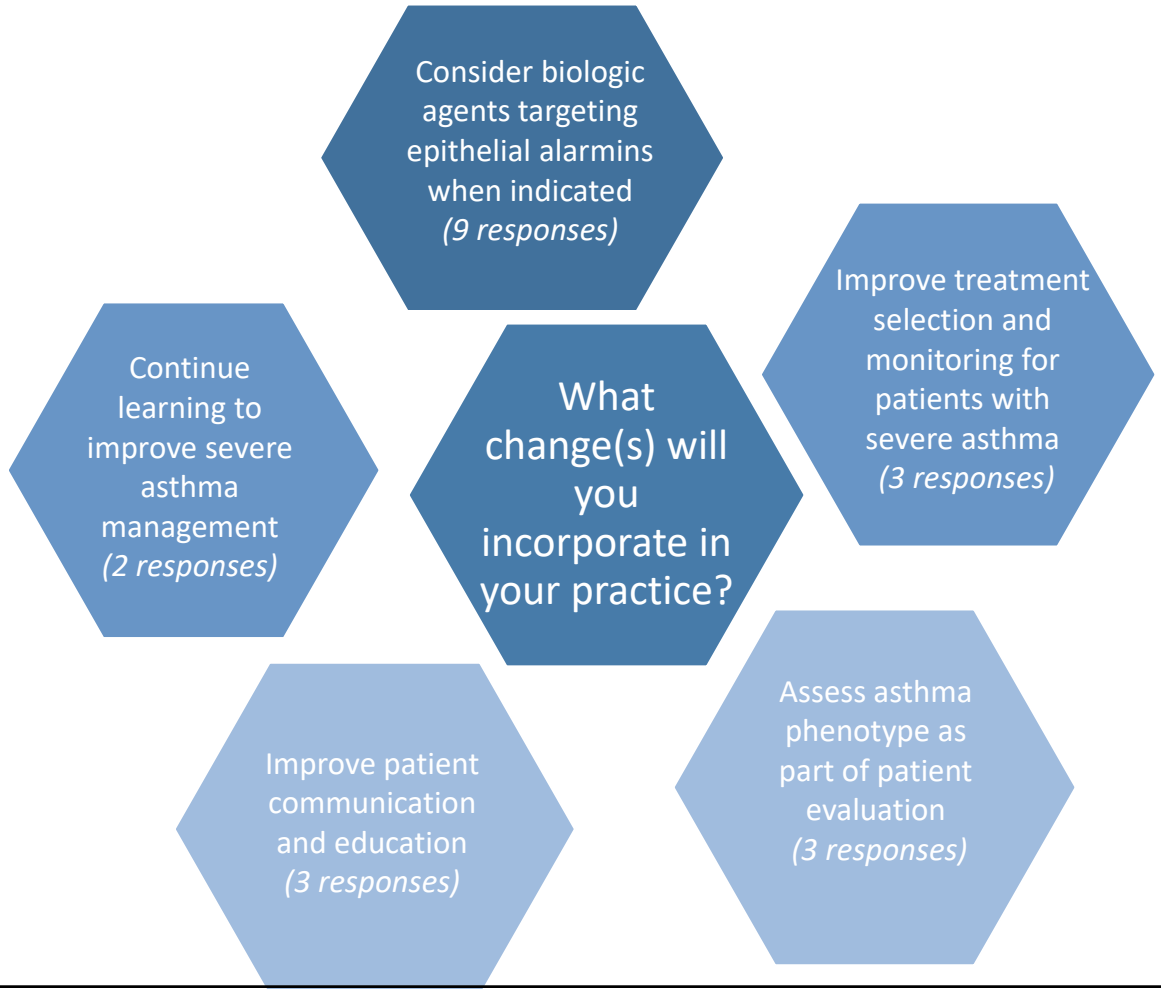
N=22



Level (4) Outcomes: Competence

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health



96%

N=22

Evaluation respondents intend to make changes in practice as a result of the activity

Evaluation Survey Results

Final Outcomes Summary – Live Broadcasts and Grand Rounds

National Jewish Health

Key Takeaways

- Importance of phenotyping asthma patients
- Importance of matching biomarkers with treatment
- Underlying pathophysiology of alarmins
- New targets for treating asthma
- Role of various biologics in treatment of asthma
- Reduce dependence on oral steroids
- More concise understanding of major alarmins

Future Topics

- Treatment options for non-atopic asthma
- Guidance in biologic selection with patient cases
- Differences in managing pediatric, adult, and elderly asthma
- Crossover between COPD and asthma
- Non-allergic asthma
- Endotypes of T2-low asthma

Accreditation Details

Final Outcomes Summary – Online Enduring and Live Broadcasts

National Jewish Health

National Jewish Health is accredited with Commendation by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The NJH Office of Professional Education produced and accredited this program and adhered to the updated ACCME guidelines.

NJH designates each live activity for a maximum of 1.0 *AMA PRA Category 1 Credit*™.

NJH designates the enduring material for a maximum of 1.0 *AMA PRA Category 1 Credit*™.