A Severe Asthma Roadmap for Improved Diagnosis and Personalized Treatment

– A Guided Workflow

- **Case simulations for work-up of difficult-to-treat and severe asthma patients**
- **Strategies for selecting targeted therapies based on emerging evidence**

A free **CME/CNE/MOC** evening symposium

MOUNT SINAI - NATIONAL JEWISH HEALTH

Respiratory Institute

Icahn School of Medicine at Mount Sinai

National Jewish Health®

Final Report: Program Overview

National Jewish Health®

Objectives

- Describe key concepts in the pathophysiology of severe asthma and the features that are targets for biologic therapies.
- Distinguish severe asthma from difficult-to-treat asthma with improved diagnostic and assessment strategies, including training in proper inhaler technique.
- Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Target Audience

Allergists, Pulmonologists, along with Primary Care Physicians, Pediatricians, Nurse Practitioners, Physician Assistants and Registered Nurses who treat patients with asthma. Nurses are targeted for the live education only.

Program Faculty

Linda Rogers, MD

Associate Professor of Medicine, Pulmonary, Critical Care and Sleep Medicine

Director, Clinical Asthma Program, Icahn School of Medicine at Mount Sinai

Mount Sinai – National Jewish Health Respiratory Institute New York, NY

Michael E. Wechsler, MD, MMSc

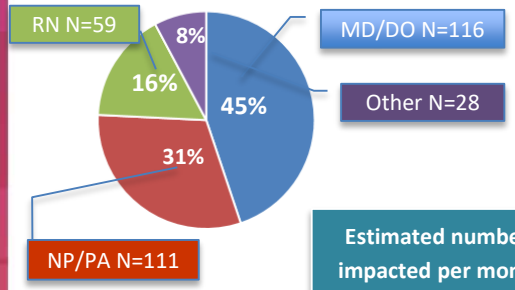
Professor of Medicine
Director, NJH Cohen Family Asthma Institute
Department of Medicine
National Jewish Health
Denver, Colorado

Final Report: Live Program Dashboard

National Jewish Health®

Participation

Total Live Participation = 359



359 Learners

63% Prescribers

55% Specialists

Estimated number of patients impacted per month: **4,154**

Satisfaction

97% of learners report activity addressed overcoming barriers to optimal patient care
95% of learners report activity met their educational needs
94% of respondents indicated that they were likely to use the infographic in practice
93% of respondents intend to make changes in practice as a result of the activity

Learner Impact

40% overall relative gain in knowledge from pre to post test for live meetings

NARROWING THE GAPS

A lack of knowledge exists related to:

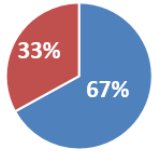
- Pathophysiology of severe asthma — **81%** increase in knowledge from pre to post test
- Proper assessment, diagnosis and inhaler — **28%** increase in knowledge from pre to post test
- Targeted therapies and biomarkers for personalized treatment — **55%** increase in knowledge from pre to post test

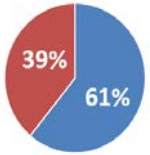
Performance

- **96%** of learners report that this activity increased their awareness of gaps in evidence-aligned care
- **98%** of learners report that the activity increased their knowledge of practice changes to improve gaps in patient care within their healthcare system

Persistent Gaps/Needs

Only 67% of learners were able to recognize biomarkers for personalized treatment in Case 1.





Only 61% were able to associate phenotype with asthma endotype.

Final Report: Online Program Dashboard

National Jewish Health®

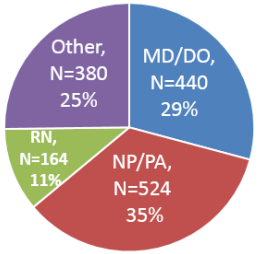
Participation

Guarantee: 1000
Actual: 1508

Completer Goal exceeded by 67%

2837 participants
1508 completers
- 64% prescribers

ProDoctor



Satisfaction

"I loved the format…the interaction with the patient and then the narrative and explanations led to better processing of the information."

"Excellent presentation"

"Very Impressed with the presentation and the depth of the information that was communicated."

"It was absolutely phenomenal"

Learner Impact

106% overall relative gain in knowledge from pre to post test for live meetings

NARROWING THE GAPS

A lack of knowledge exists related to:

- Pathophysiology of severe asthma — **134%** relative gain In knowledge from pre to post test
- Proper assessment, diagnosis and inhaler — **160%** relative gain in knowledge from pre to post test
- Targeted therapies and biomarkers for personalized treatment — **109%** relative gain in knowledge from pre to post test

Performance

89% can classify asthma after participating in simulation

Knows to classify Audra's asthma severity as severe persistent.

84% can identify comorbid conditions after participating in simulation

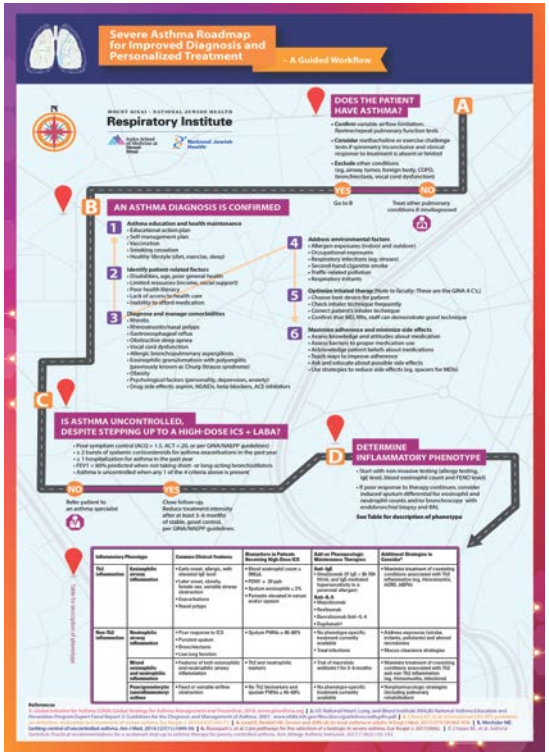
Knows James' rhinosinusitis is comorbid.

Persistent Gaps/Needs

Gaps remain related to the classification of asthma severity

79% remain unable to identify biomarkers
75% are unclear on test selection

Key Features of Program Design



Final Report (8/28/19)
Live Educational Initiative
Grant ID: 39219313

Background

The **online enduring case-based simulation** was developed first and then (6) **live evening symposia** were held in cities across the US. The live meeting employed the structure of cases developed for the online simulation to engage learners in the multi-media live presentations. An **infographic clinical reference aid** and use of the audience response system (ARS) were used to reinforce learning. Learners stepped through decisions in 2 case simulations to test and reinforce their skills in diagnosis, treatment, and management of severe asthma.

National Jewish Health®
Breathing Science is Life.®

Final Report: Program Background

National Jewish Health®

Background

This collaborative program is in partnership with the Mount Sinai – National Jewish Health Respiratory Institute and will feature an online enduring program of case-based simulations as well as six interactive workshops in the United States. The goal of the proposed program will be to improve the knowledge and competence of **allergists, pulmonologists, primary care physicians and pediatricians**, in the diagnosis, management, and treatment of severe asthma during a live and online multimedia initiative.

Format

Interactive, multimedia online and live program with simulation-based structure that follows a workflow for treating severe asthma.

Anticipated Reach

LIVE: 210-270 learners for the live activities
ONLINE: 4000 participants and 1000 completers

Live Activity Dates & Locations:

July 19, 2018 in New York, NY
August 1, 2018 in Denver, CO
August 21, 2018 in Philadelphia, PA
August 28, 2018 in Los Angeles, CA
November, 5 2018 in San Francisco, CA
November 14, 2018 in Houston, TX

Outcomes Strategy:

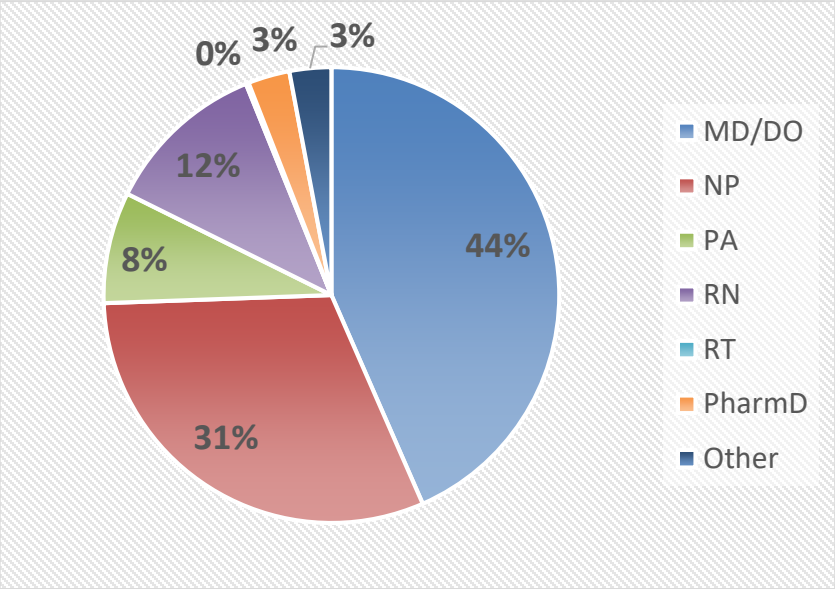
Outcomes will be measured via participation totals, specialty, designation, pre-test, post-test, clinically based decisions in case simulations, interactive polling questions, and evaluations. The metrics will demonstrate participation, satisfaction, engagement, and change in knowledge, competency, and performance to achieve Moore's Level 5 outcomes. Impact was measured by effect size as calculated by Cohen's d and levels of significance.

Final Report: Six Live Activities
Level 1 Outcomes: Participation

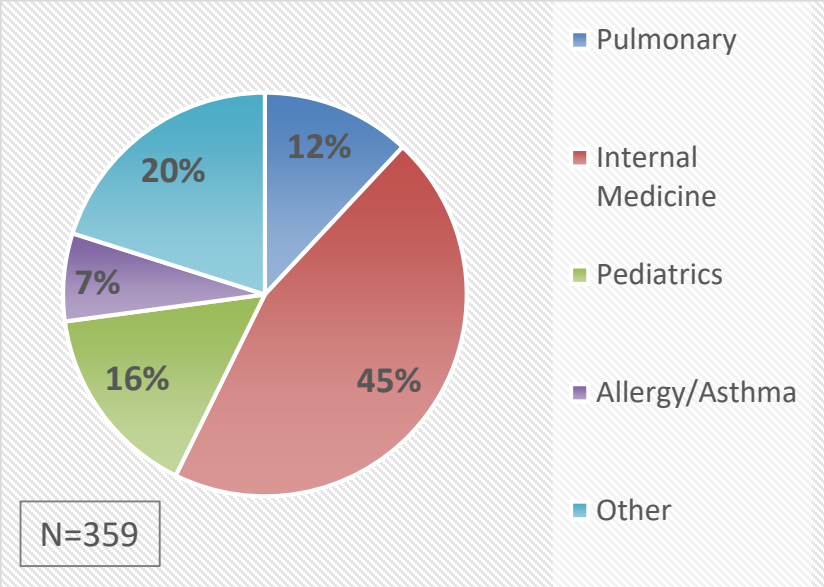
New York, NY: 6/20/2018	**77**
Denver, CO: 8/1/2018	**74**
Philadelphia, PA: 8/21/2018	**40**
Los Angeles, CA: 8/28/2018	**60**
San Francisco, CA: 11/5/2018	**61**
Houston, TX: 11/14/2018	**47**
Total Live Participation	**359**

Final Report: Six Live Activities

Level 1 Outcomes: Participation



63% of learners are prescribers



*Other: AE-C, MPH, BA, PhD, Nephrology, Occupational Health, ICU, Oncology, Pharmacy, Anesthesiology, Emergency

Final Report: Six Live Activities

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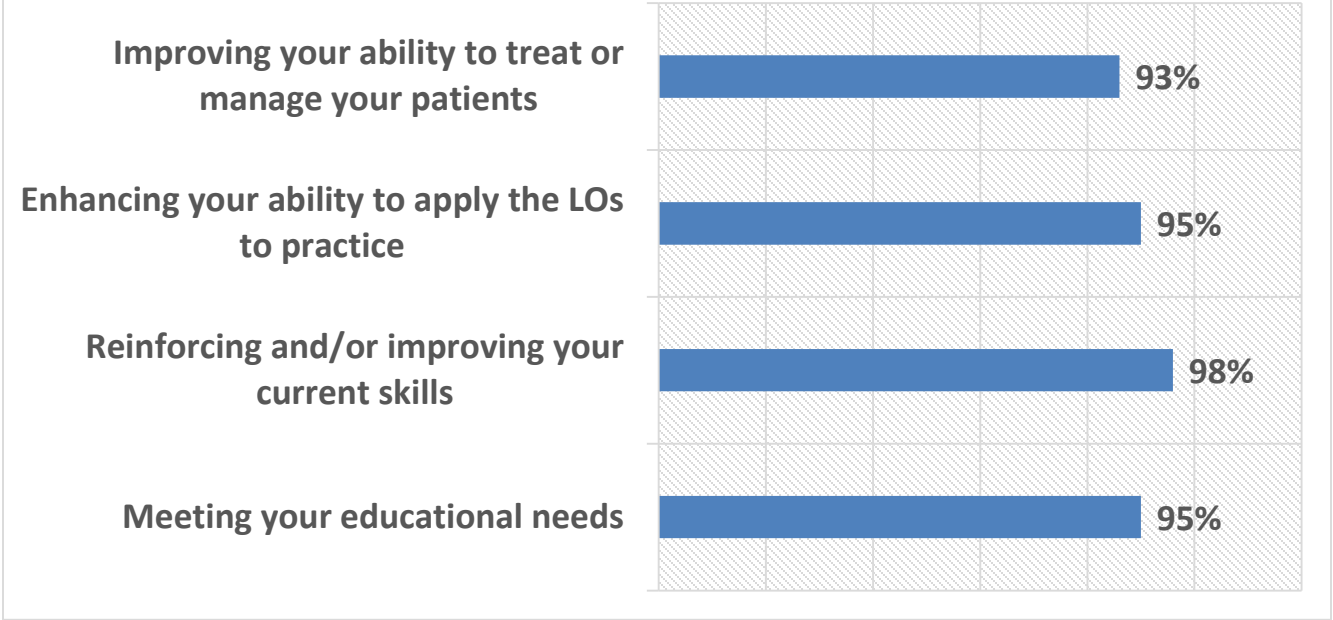
Level 2 Outcomes: Learning & Satisfaction

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



N=164

Final Report: Six Live Activities

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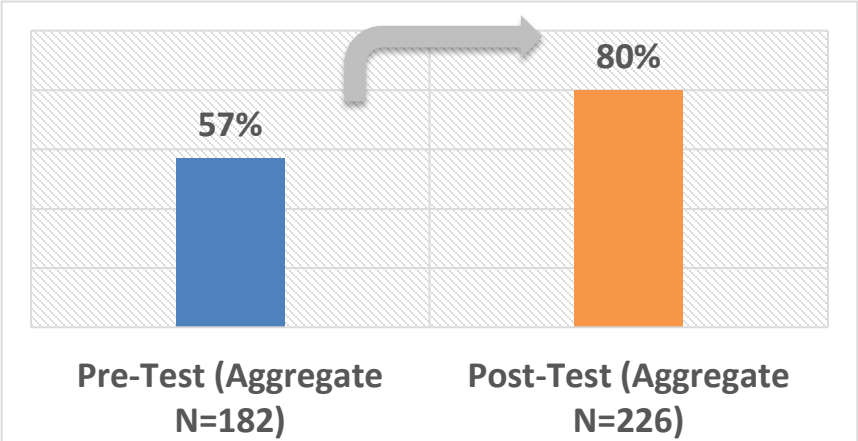
Level 2 Outcomes: Pre-Test/Post-Test



Level 3 and 4 outcomes were measured by comparing pre-and post-test answers. Attendees' responses to these questions demonstrated that **participants gained knowledge as a result of the activity.**

Overall relative knowledge gain from pre- to post activities

40%

Overall impact for all live activities combined resulted in a moderate but significant ($p<.0001$) effect size as reflected by Cohen's d statistic which detects the standardized difference between two means ($d=0.54$).

Cohen(1988): .2=small, .5=medium, .8=large

Wolf (1986): .25=educationally significant, .50 clinically significant.

Assessment: Pre-Test/Post-Test (Question 1)

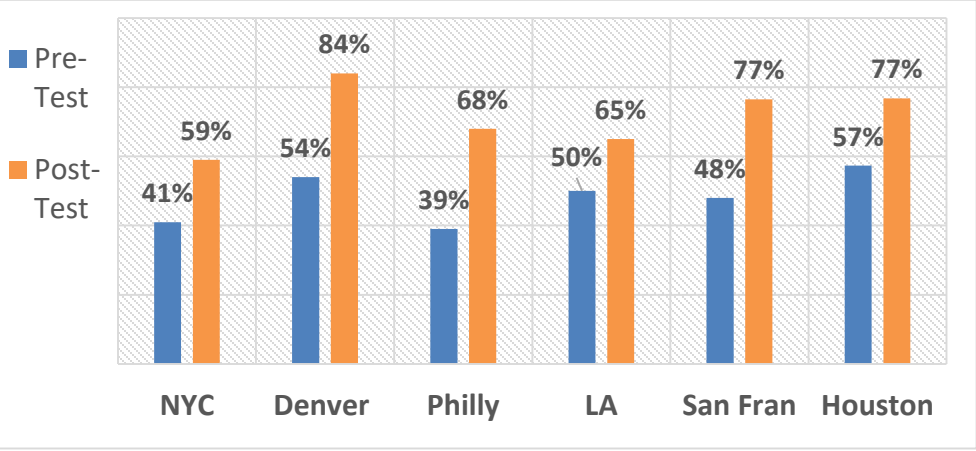
Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Q1: A 48-year-old lifetime non-smoker woman with a history of asthma, nasal polyps and chronic rhinosinusitis is referred for persistent symptoms, frequent exacerbations despite moderate dose ICS/LABA, LAMA, leukotriene modifier, rescue SABA, and nasal steroids. On your assessment: Her inhaler technique is good, Pharmacy records confirm monthly refills, Symptoms of allergic rhinitis are controlled and she has no other comorbidities, Her IgE is 30 and allergy testing is negative, Her absolute eosinophil count is 500/uL. You recommend the following treatment:

A. Chronic oral steroids
B. Anti-IL-5 ✓
C. Bronchial thermoplasty
D. Omalizumab

Average Pre N= 31
Average Post N= 38

Relative gain: 50%
Aggregate Pre = 48%
Aggregate Post= 72%
P<.0001 d=0.49

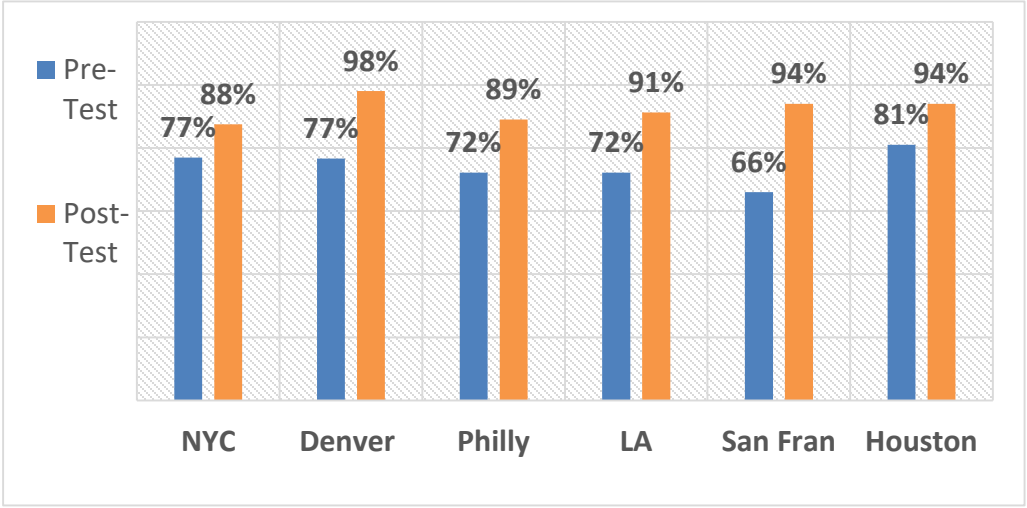


Assessment: Pre-Test/Post-Test (Question 2)

Learning Objective: Distinguish severe asthma from difficult-to-treat asthma with improved diagnosis and assessment strategies, including proper inhaler technique.

Q2: A 70-year-old woman with lifelong severe allergic asthma presents to you with uncontrolled asthma despite prescribed high dose ICS/LABA, leukotriene modifiers and tiotropium. She is hospitalized twice per year and requiring oral prednisone rescue courses 4x per year. The next step in her management is the following:

A. Start her on omalizumab
B. Add theophylline
C. Add oral prednisone
D. Check her inhaler technique and pharmacy refill records ✓



Average Pre N= 31
Average Post N= 38

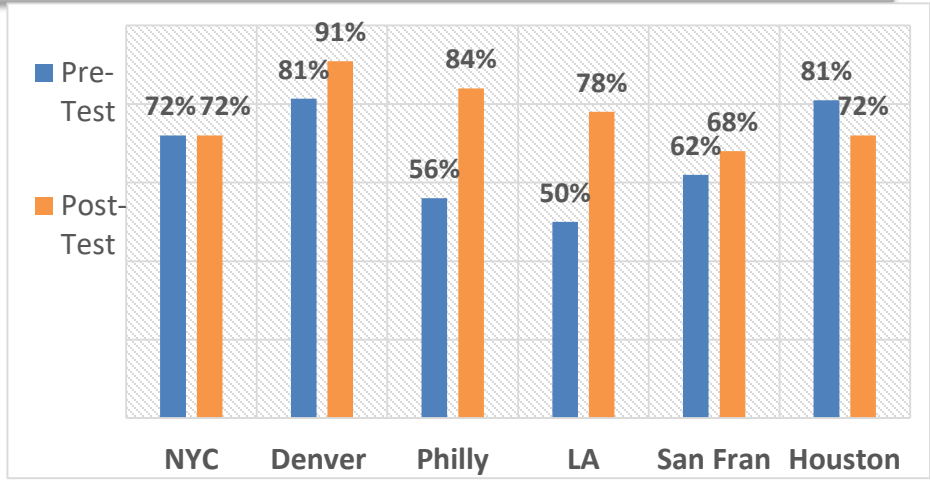
Relative gain: 24%
Aggregate Pre = 74%
Aggregate Post= 92%
P<.0001 d=0.49

Assessment: Pre-Test/Post-Test (Question 3)

Learning Objective: Distinguish severe asthma from difficult-to-treat asthma with improved diagnosis and assessment strategies, including proper inhaler technique.

Q3: Your patient is a 55-year-old obese woman (BMI 35 mg/kg2) with severe persistent asthma (onset at age 39) with uncontrolled symptoms despite intensive therapy. Comorbidities include GERD and sleep apnea controlled with PPI and CPAP. Skin prick testing is negative for common aeroallergens. IgE = 100 IU/L but allergy testing is negative. Absolute eosinophil count is 100/uL. FeNO = 10 ppb. Induced sputum shows neutrophilic inflammation. The next step in her management is the following:

A. Start omalizumab after patient loses significant weight
B. Start mepolizumab
C. Confirm adherence to current therapy, and recommend weight loss strategies ✓
D. Recommend oral steroids



Average Pre = 31
Average Post = 38

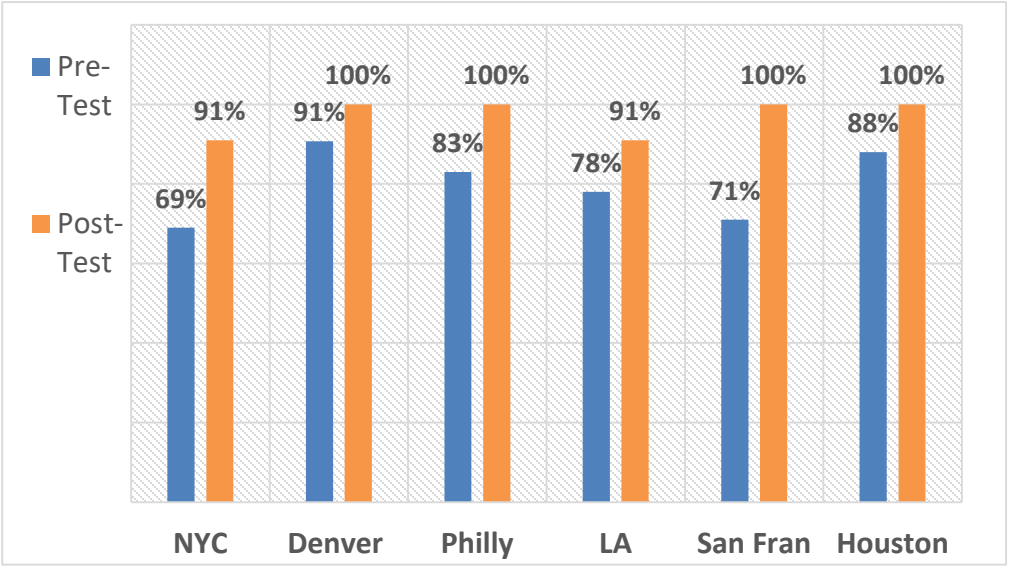
Relative gain: 16%
Aggregate Pre = 67%
Aggregate Post= 78%
P=.033 d=0.22

Assessment: Pre-Test/Post-Test (Question 4)

Learning Objective: Describe key concepts in the pathophysiology of severe asthma and the features that are targets for biologic therapies.

Q4: In patients with asthma, anti-IL-5 treatment is associated with:

A. **Reduction in oral corticosteroid in steroid dependent patients ✓**
B. No change in exacerbation rates
C. Increased risk of pneumonia compared to placebo
D. An increased risk of certain cancers



Average Pre = 31
Average Post = 38

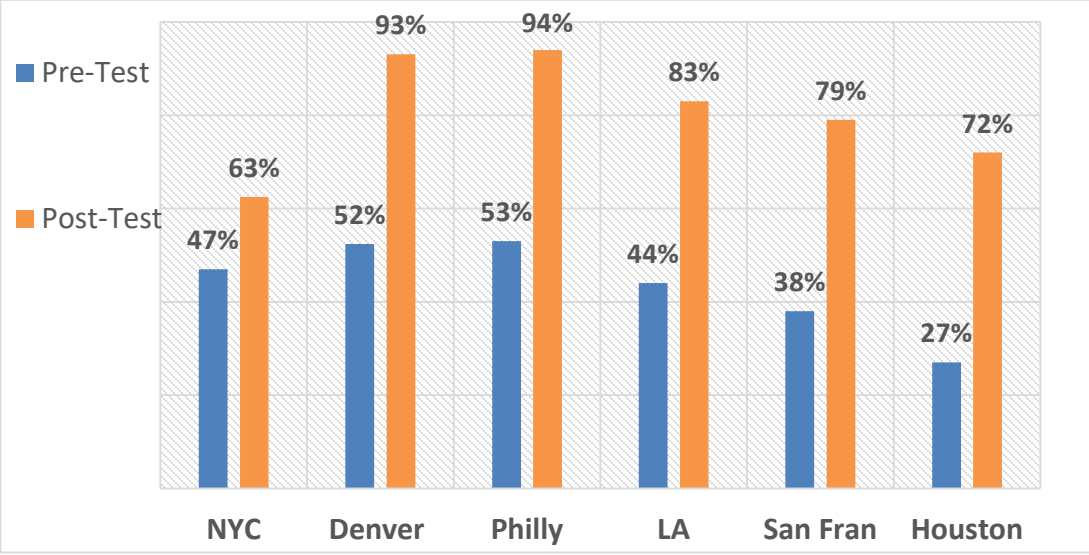
Relative gain: 21%
Aggregate Pre = 80%
Aggregate Post= 97%
P<.0001 d=0.98

Assessment: Pre-Test/Post-Test (Question 5)

Learning Objective: Describe key concepts in the pathophysiology of severe asthma and the features that are targets for biologic therapies.

Q5: Which of the following does not block IL-5 or its receptor?

A. **Dupilumab ✓**
B. Benralizumab
C. Mepolizumab
D. Reslizumab



Average Pre = 31
Average Post = 38

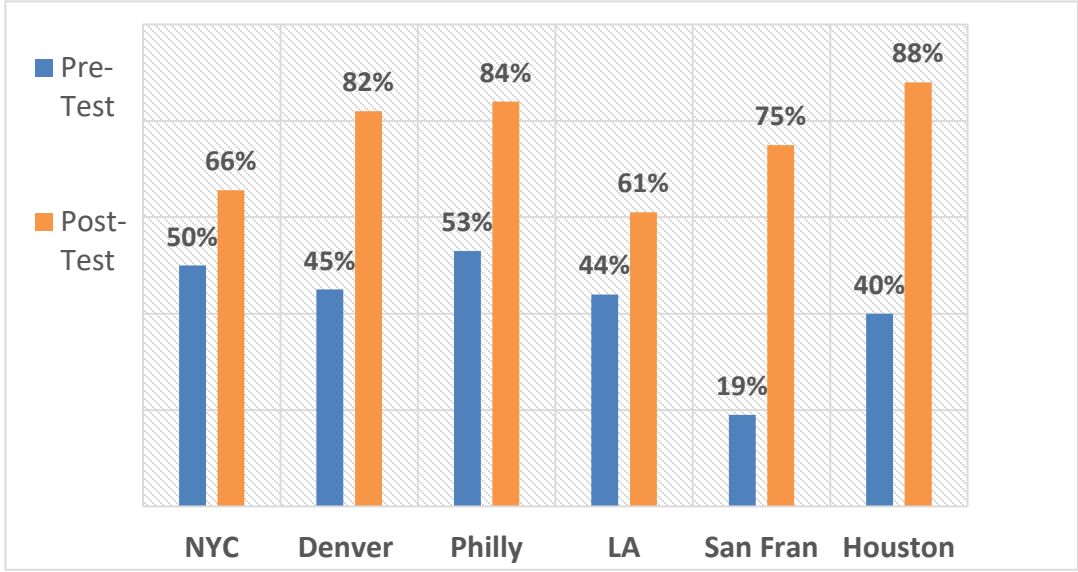
Relative gain: 84%
Aggregate Pre = 44%
Aggregate Post= 81%
P<.0001 d=0.84

Assessment: Pre-Test/Post-Test (Question 6)

Learning Objective: Describe key concepts in the pathophysiology of severe asthma and the features that are targets for biologic therapies.

Q6: Type 2 inflammation is associated with all of the following except:

A. High exhaled nitric oxide
B. High blood eosinophils
C. High blood neutrophils ✓
D. Allergies



Average Pre = 31
Average Post = 38

Relative gain: 81%
Aggregate Pre = 42%
Aggregate Post= 76%
P<.0001 d=0.72

Assessment: Pre-Test/Post-Test (Question 7)

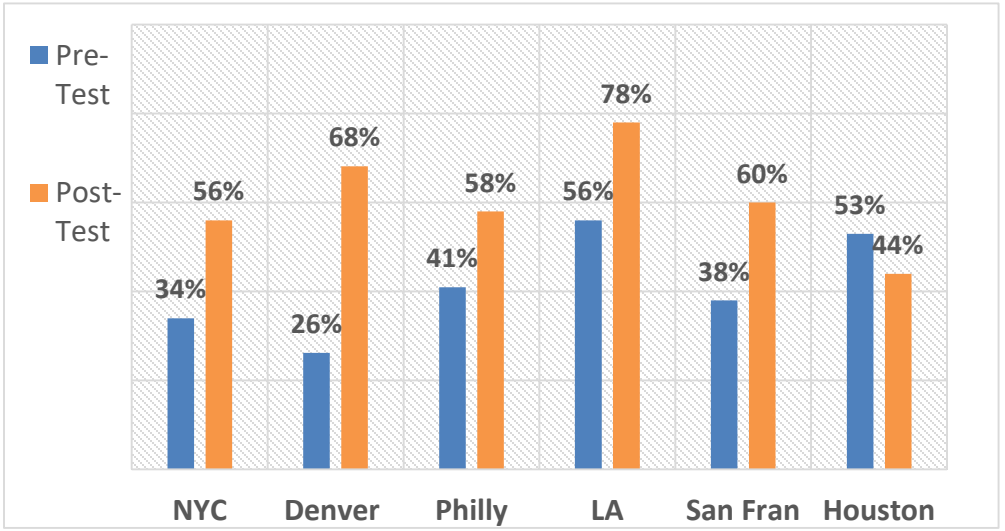
Learning Objective: Distinguish severe asthma from difficult-to-treat asthma with improved diagnosis and assessment strategies, including proper inhaler technique.

Q7: Which of the following is least commonly associated with non-type 2 asthma?

A. Childhood onset ✓
B. Steroid nonresponsiveness
C. Obesity
D. Viral infection

Average Pre = 31
Average Post = 38

Relative gain: 45%
Aggregate Pre = 42%
Aggregate Post= 61%
P<.0001 d=0.38



Final Report: Six Live Activities

Audience Response System

The first three meetings featured interactive group polling questions via audience response system (ARS). The questions were asked of the entire group, however, each table of participants were given the opportunity to discuss and select an answer together as a group using one ARS key pad instead of providing individual answers. However, in the fourth, fifth and sixth meetings we changed some of the ARS questions and gave each audience member an ARS keypad in lieu of one per table to encourage group discussion and decision-making. We decided to make this change to get more data from participants to help elucidate some of the findings in our preliminary analysis of the online enduring program data.

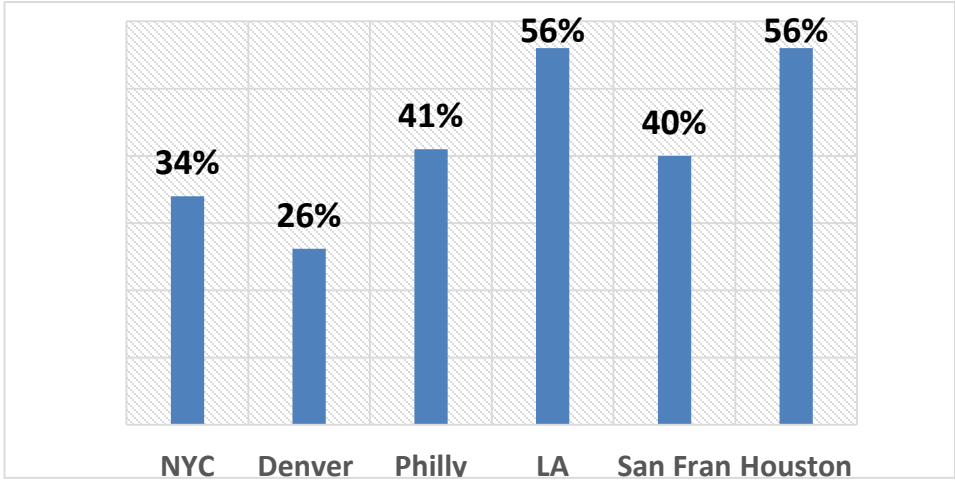
Final Report: ARS Highlights

National Jewish Health®

A test and teach approach was used to engage learners during the live meetings by testing their existing knowledge and using the gaps to teach them the new material presented in the live activity. Over the course of the six live meetings, we adjusted the questions and the approach. Questions were tailored to the patient cases to test learner's understanding of the proper steps in diagnosing and treating severe asthma.

Q1: Which of the following features is required for a diagnosis of asthma?

A. Eosinophilic airway inflammation
B. Smooth muscle hypertrophy and hyperplasia
C. Variable airflow limitation
D. IgE to specific allergens



Final Report: ARS Highlights

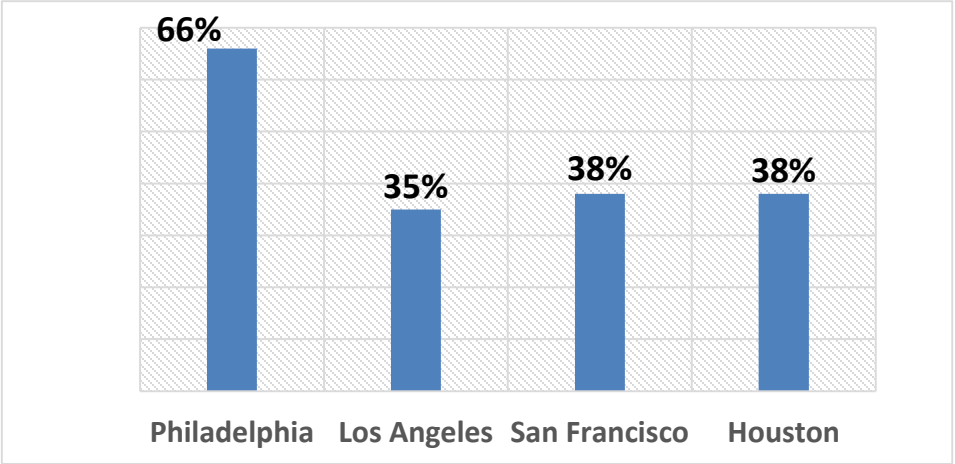
National Jewish Health®

Formative Evaluation Strategies

The following question was added before the meeting in Philadelphia to dig deeper into the differences between the various biologic therapies.

Q4:For patients like Audra it is important to assess bone density. Low bone density, weight gain, and cataracts are some potential steroid-related side effects. All of the following have been demonstrated to facilitate steroid reduction while reducing asthma exacerbation except:

A. Anti IL-4 receptor alpha monoclonal antibody
B. Anti IL-13 monoclonal antibody
C. Anti IL-5 receptor monoclonal antibody
D. Anti IL-5 monoclonal antibody



Final Report: Six Live Activities
Learner Evaluation

- **93%** of learners report that they intend to make changes to practice as a result of the activity
- **100%** of learners report that the content presented was evidence based and clinically relevant
- **97%** of learners report that the activity addressed strategies for overcoming barriers to optimal patient care
- **99%** of learners report that the material was presented in an objective manner and free of commercial bias

Final Report: Level 5 Outcomes
Self-Reported Performance

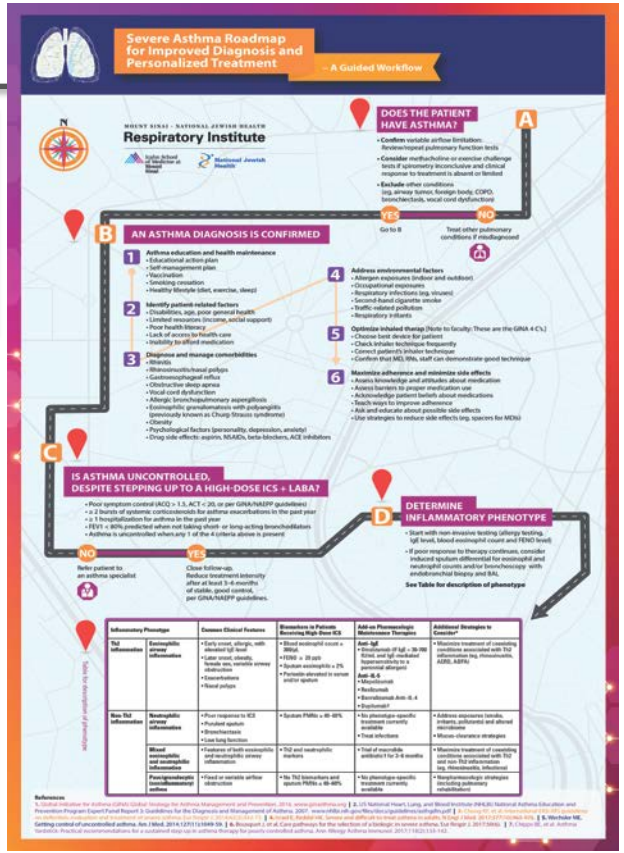
- **49%** of learners report that they have changed their screening and prevention practice as a result of this activity
- **48%** of learners report that the activity provided new ideas or information that they have used in practice
- **96%** of learners report that this activity increased their awareness of gaps in evidence-aligned care
- **98%** of learners report that the activity increased their knowledge of practice changes that may improve gaps in patient care within their healthcare system

Final Report: Six Live Activities

National Jewish Health®

Learner Evaluation – Clinical Reference Aid

94% of learners report that they are somewhat to extremely likely to use the clinical reference aid infographic in practice



Attendee Feedback on the Infographic

"…wondering if I could get copies of the guided workflow to help educate the residents and fellows at our hospital."

-MD attendee in New York, NY

"Would it be possible to get some extra copies of the folders with the slides and workflow to share with some colleagues and students who could not attend last night?"

-MD attendee in Denver, CO

Qualitative Summary of Live Activities

National Jewish Health®

Key Lessons Learned

- Different phenotypes of asthma, new therapies and how to check technique
- Treatment modalities
- Classification of phenotypes and stepwise addition of medicines
- Reinforcing correct use of inhalers
- Systematically follow the severe asthma roadmap
- There are new biologic therapies to effectively treat severe asthma

Needs for Further Education

- Patient education about asthma
- Smoking cessation strategies
- Complicated asthma patients with significant co-morbidities
- COPD
- Urticaria
- ILD/IPF

Attendee Feedback

"The speaker was excellent and engaging."

"It was excellent."

"Really exceptional speaker. Very engaging, funny and obviously educated and passionate about the topic."

"Thank you for a very well organized and interesting presentation."

"Would love to attend another lecture by Dr. Wechsler. He is an excellent speaker and related so much valuable information in a short time."

Online Activity: Final Report

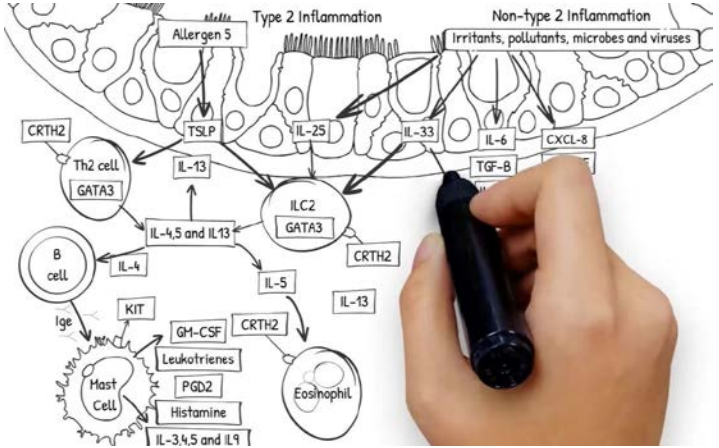
National Jewish Health®

Launched July 13, 2018

https://learning.freecme.com/a/29687PAvVjT

Target Audience

Allergists, Pulmonologists, along with Primary Care Physicians, Pediatricians, Nurse Practitioners, Physician Assistants and Registered Nurses who treat patients with asthma.



Final Report: Online Program Dashboard

National Jewish Health®

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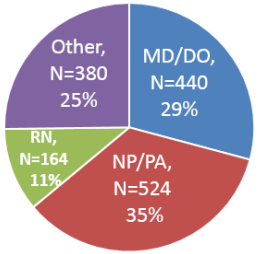

Satisfaction

"I loved the format…the interaction with the patient and then the narrative and explanations led to better processing of the information."

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Learner Impact

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Performance

89% can classify asthma after participating in simulation

Knows to classify Audra's asthma severity as severe persistent.

84% can identify comorbid conditions after participating in simulation

Knows James' rhinosinusitis is comorbid.

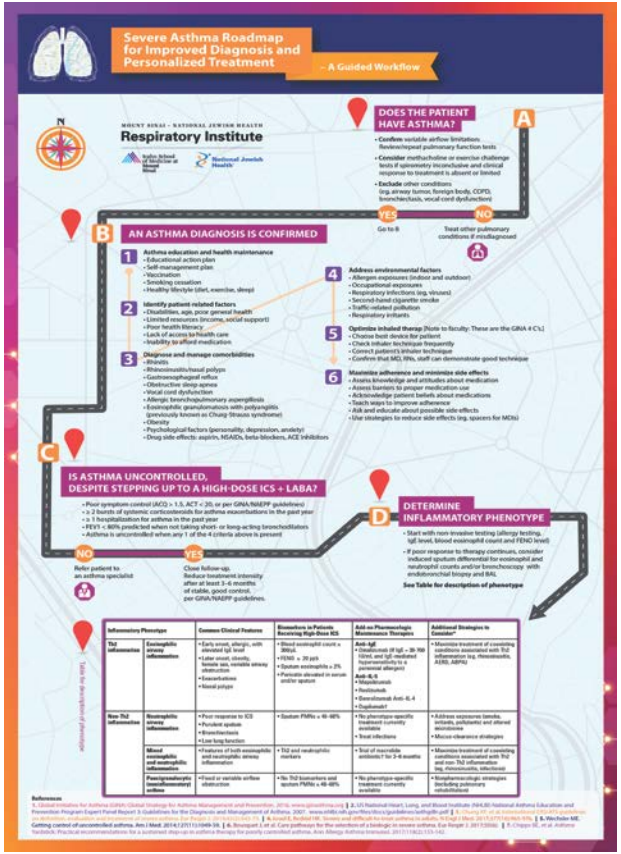
Persistent Gaps/Needs

Gaps remain related to the classification of asthma severity

79% remain unable to identify biomarkers
75% are unclear on test selection

Online Case Simulation Platform

The online activity uses ProDoctor's innovative simulation platform to highlight two patient cases (1 difficult-to-treat asthma and 1 severe asthma). Learners are challenged to make decisions regarding the workup, tests, and differential diagnosis of severe asthma in both cases. Key learning points were reinforced with an infographic clinical reference aid developed for the use in both the live and online activity.



Guide to ProDoctor Heatmaps

National Jewish Health®

Users make decisions on therapy choices, disease management, and many other competencies.

Which of the following consults will you request?

Answer Choices:

Select one

- 1) Gastroenterology for repeat EGD
- 2) Endocrinology for diabetes management
- 3) Endocrinology for repeat DEXA scan
- 4) Dietician for weight loss

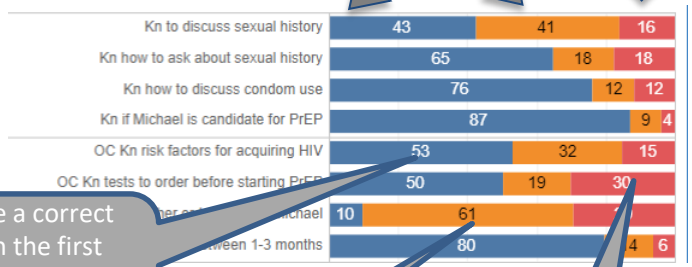
THAT IS INCORRECT

THAT IS CORRECT

If they make an incorrect choice they receive mentoring by Dr. Grey

Blue and **orange** represent learning or reinforcement.

Analyze **red** as ongoing gaps.



If they make a correct decision on the first attempt then they are in the **blue** section of the heatmap.

If they make a correct choice after mentoring they are in the **orange** section of the heatmap.

If they make an incorrect choice after mentoring they are in the **red** section of the heatmap.

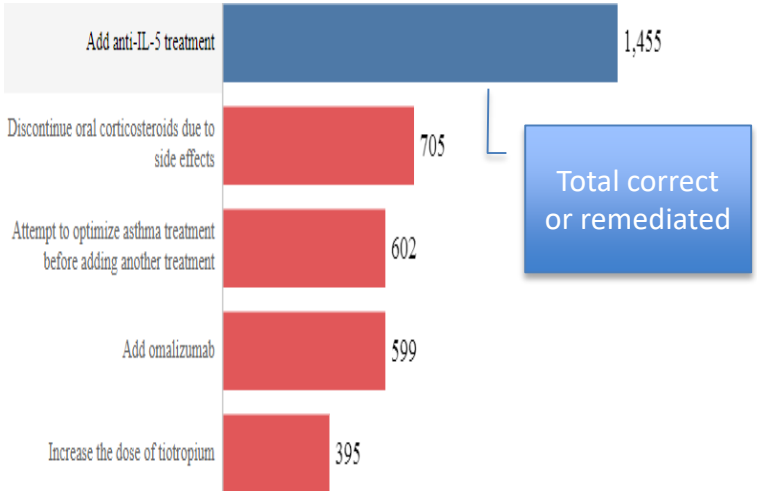
Level 5 Performance by Learning Objective

National Jewish Health®

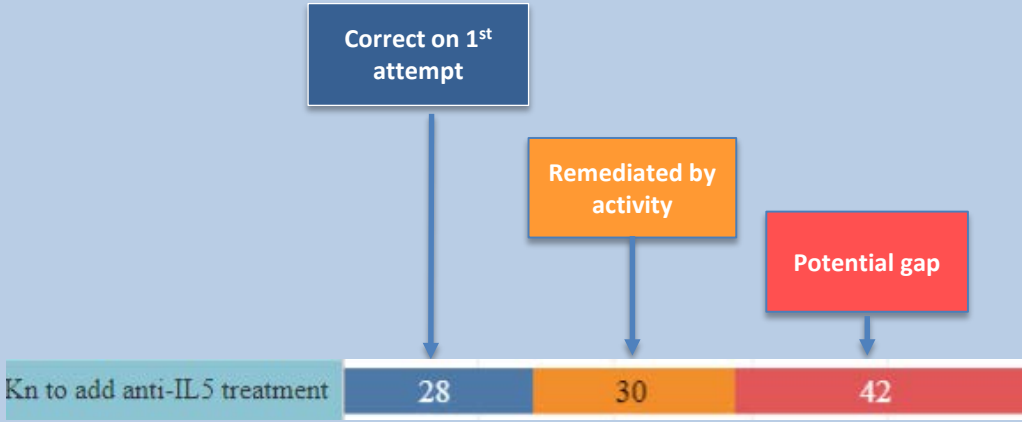
Learning Objective 1: Describe key concepts in the pathophysiology of severe asthma and the features that are targets for biologic therapies.

ProDoctor Heatmap Data:

While the activity demonstrated significant learning related to add-on biologic therapy, a potential gap exists related to determining severe asthma endotype and phenotype for personalized treatment selection.



Learner performance after viewing simulation:



*Numbers represent percentages

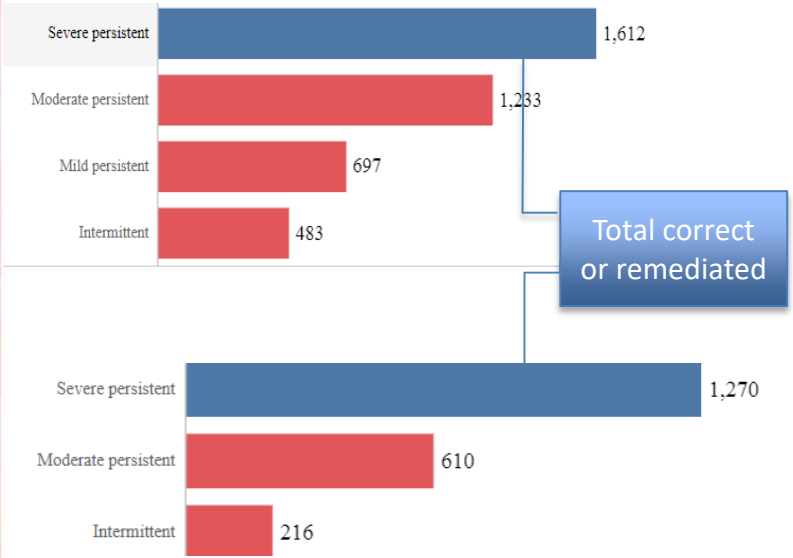
Level 5 Performance by Learning Objective

National Jewish Health®

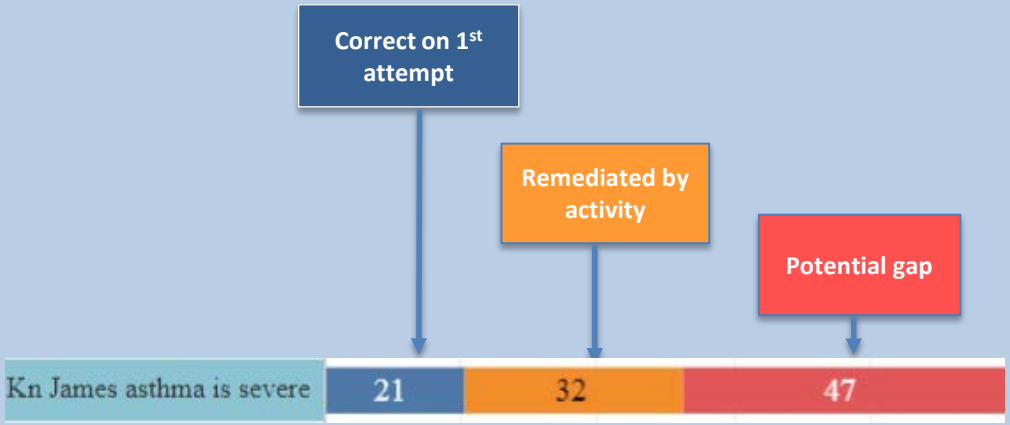
Learning Objective 2: Distinguish severe asthma from difficult-to-treat asthma with improved diagnostic and assessment strategies, including training in proper inhaler technique.

ProDoctor Heatmap Data:

Learners were able to classify Audra's asthma (bottom graph) more proficiently than James (top graph) a potential gap exists related to the ability to distinguish asthma severity.

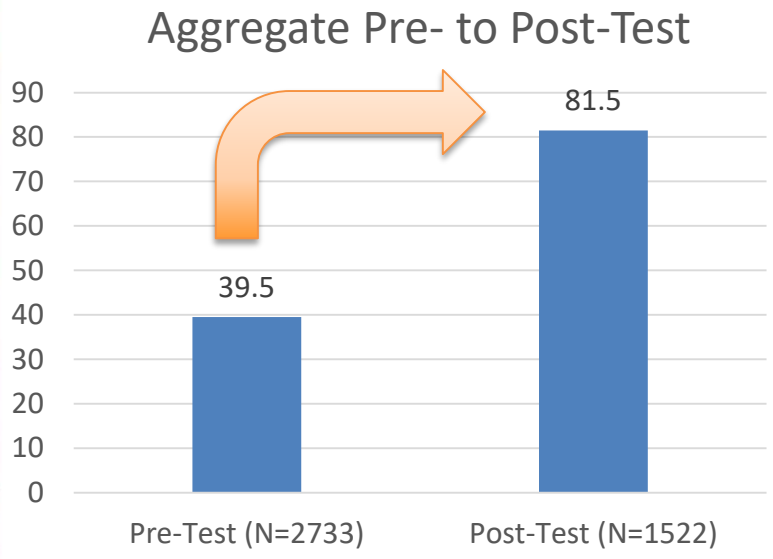


Learner performance after viewing simulation:



*Numbers represent percentages

Online Enduring Metrics



In addition to questions posed in the online simulations, a set of standard pre/post questions were presented to learners upon entry into the activity via FreeCME and after completion of the ProDoctor simulation.

Overall relative knowledge gain from pre- to post activities

106%

Overall impact for all live activities combined resulted in a large and significant ($p<.0001$) effect size as reflected by Cohen's d statistic which detects the standardized difference between two means ($d=0.90$).

Cohen(1988): .2=small, .5=medium, .8=large

Wolf (1986): .25=educationally significant, .50 clinically significant.

Online Pre-Post Test Question

National Jewish Health

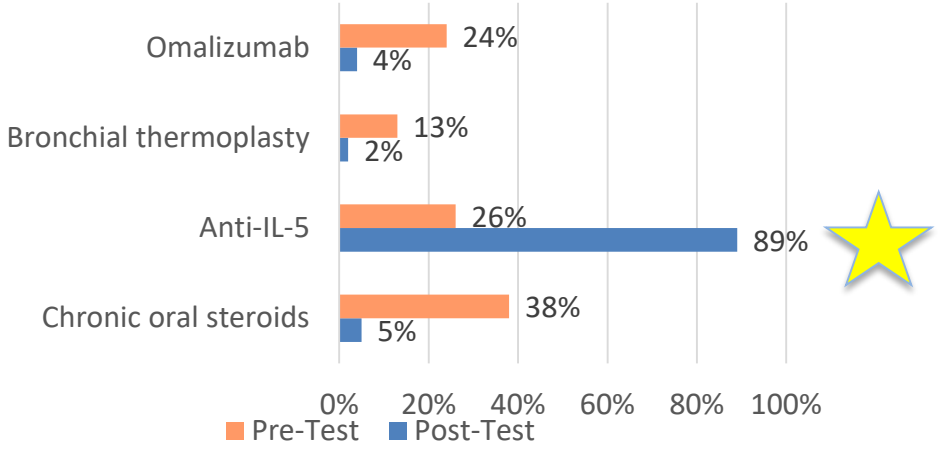
Level 3: Outcomes: Knowledge

Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Question 1: A 48-year-old lifetime non-smoker woman with a history of asthma, nasal polyps and chronic rhinosinusitis is referred for persistent symptoms, frequent exacerbations despite moderate dose ICS/LABA, LAMA, leukotriene modifier, rescue SABA, and nasal steroids.
On your assessment: Her inhaler technique is good. Pharmacy records confirm monthly refills. Symptoms of allergic rhinitis are controlled and she has no other comorbidities. Her IgE is 30 and allergy testing is negative. Her absolute eosinophil count is 500/uL. You recommend the following treatment:

Pre N=2733
Post N=1522

Relative gain: 81%
Aggregate Pre = 42%
Aggregate Post= 76%
P<.0001 d=0.72



Online Pre-Post Test Question

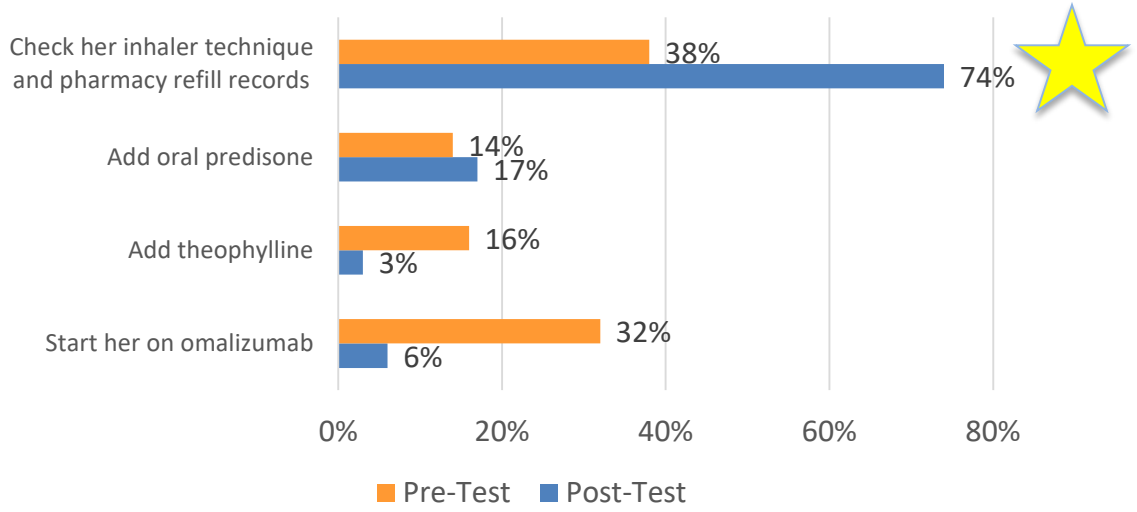
Level 3 Outcomes: Knowledge

Learning Objective: Distinguish severe asthma from difficult-to-treat asthma with improved diagnosis and assessment strategies, including proper inhaler technique.

Question 2: A 70-year-old woman with lifelong severe allergic asthma presents to you with uncontrolled asthma despite prescribed high dose ICS/LABA, leukotriene modifiers and tiotropium. She is hospitalized twice per year and requiring oral prednisone rescue courses 4x per year. The next step in her management is the following:

Pre N=2733
Post N=1522

Relative gain: 95%
Aggregate Pre = 38%
Aggregate Post= 74%
P<.0001 d=0.35



Online Pre-Post Test Question

National Jewish Health

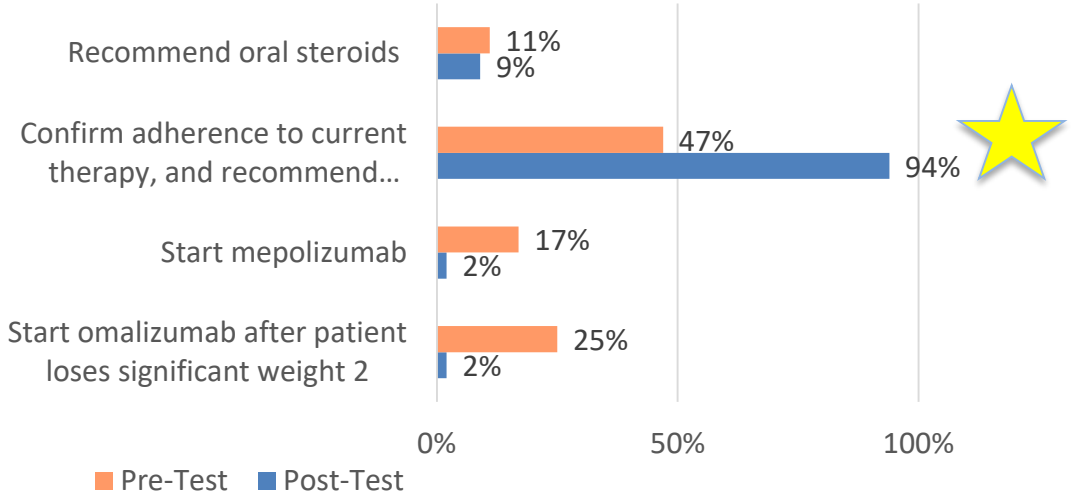
Level 3: Outcomes: Knowledge

Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Question 3: Your patient is a 55-year-old obese woman (BMI 35 mg/kg2) with severe persistent asthma (onset at age 39) with uncontrolled symptoms despite intensive therapy. Comorbidities include GERD and sleep apnea controlled with PPI and CPAP. Skin prick testing is negative for common aeroallergens. IgE = 100 IU/L but allergy testing is negative. Absolute eosinophil count is 100/uL. FeNO = 10 ppb. Induced sputum shows neutrophilic inflammation. The next step in her management is the following:

Pre N=2733
Post N=1522

Relative gain: 100%
Aggregate Pre = 47%
Aggregate Post= 94%
P<.0001 d=0.51



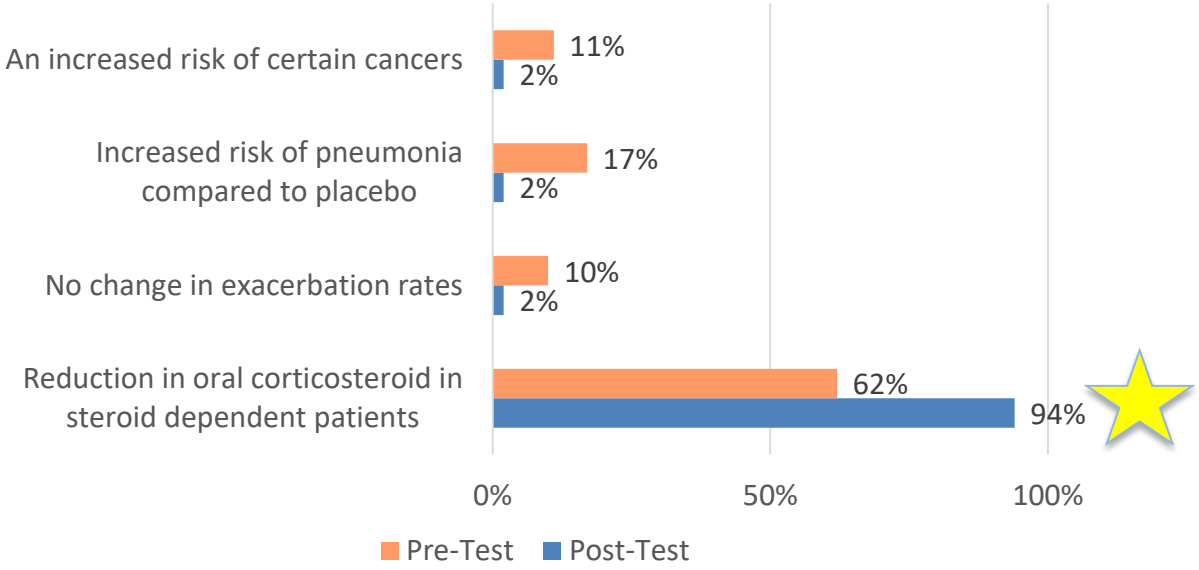
Online Pre-Post Test Question

National Jewish Health

Level 3: Outcomes: Knowledge

Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Question 4: In patients with asthma, anti-IL-5 treatment is associated with:



Pre N=2733
Post N=1522

Relative gain: 52%
Aggregate Pre = 62%
Aggregate Post= 94%
P<.0001 d=0.35

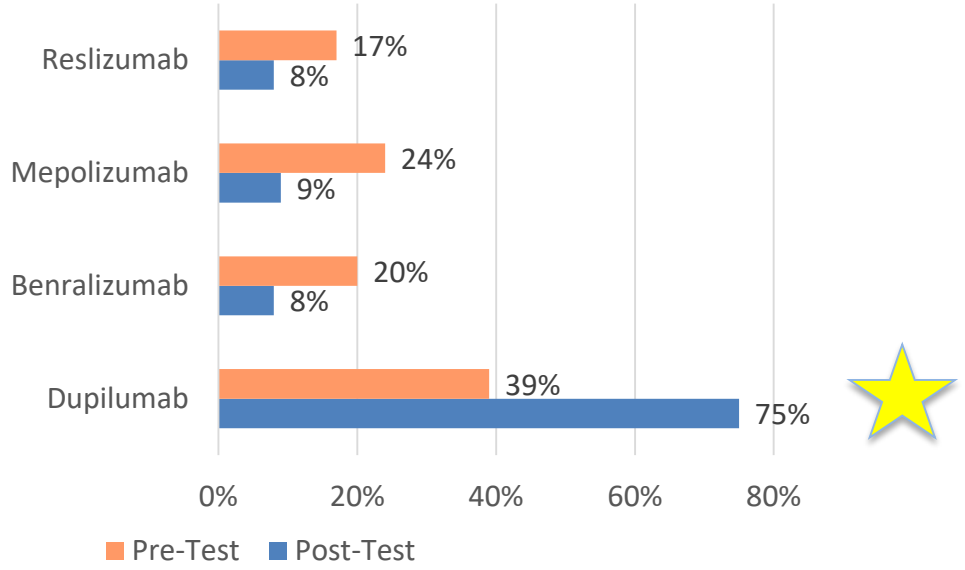
Online Pre-Post Test Question

National Jewish Health

Level 3: Outcomes: Knowledge

Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Question 5: Which of the following does not block IL-5 or its receptor?



Pre N=2733
Post N=1522

Relative gain: 92%
Aggregate Pre = 39%
Aggregate Post= 75%
P<.0001 d=0.36

Online Pre-Post Test Question

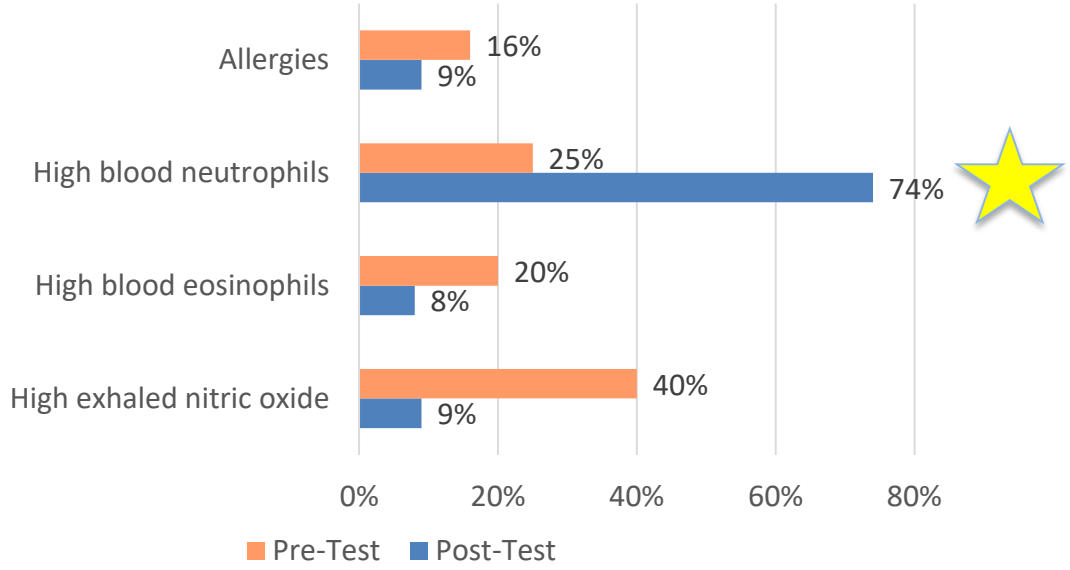
Level 3: Outcomes: Knowledge

Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Question 6: Type 2 inflammation is associated with all of the following except:

Pre N=2733
Post N=1522

Relative gain: 196%
Aggregate Pre = 25%
Aggregate Post= 74%
P<.0001 d=0.52



Online Pre-Post Test Question

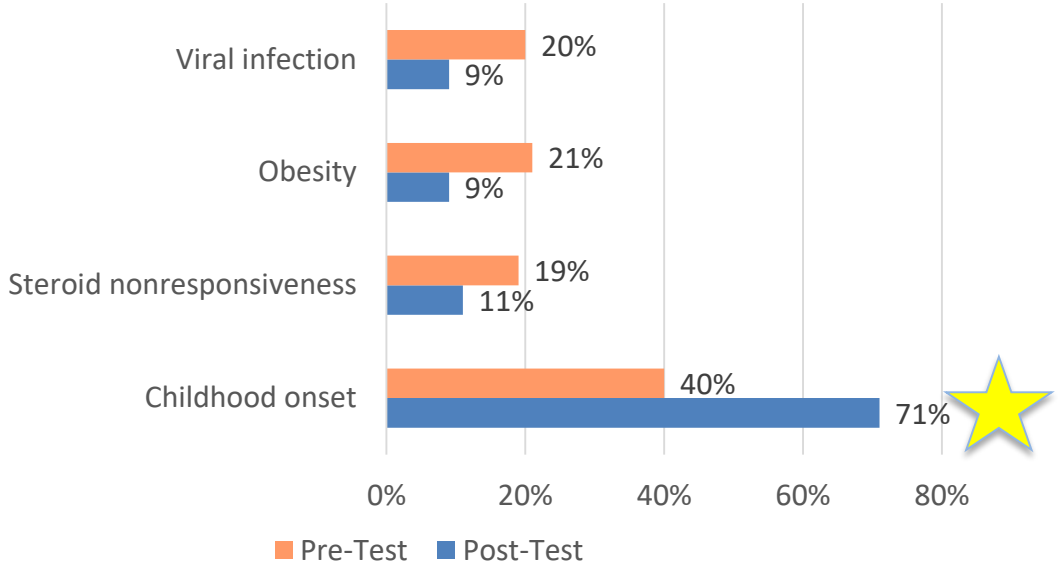
Level 3: Outcomes: Knowledge

Learning Objective: Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Question 6: Which of the following is least commonly associated with non-type 2 asthma?

Pre N=2733
Post N=1522

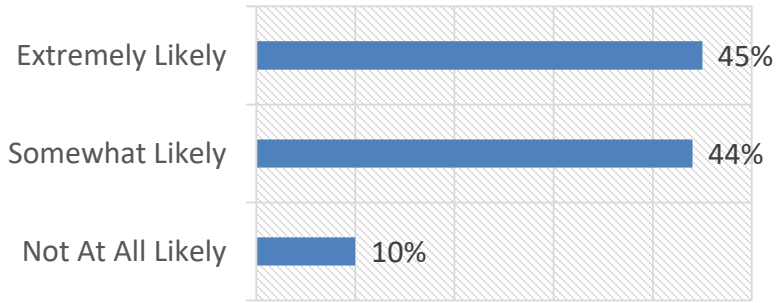
Relative gain: 78%
Aggregate Pre = 40%
Aggregate Post= 71%
P<.0001 d=0.32



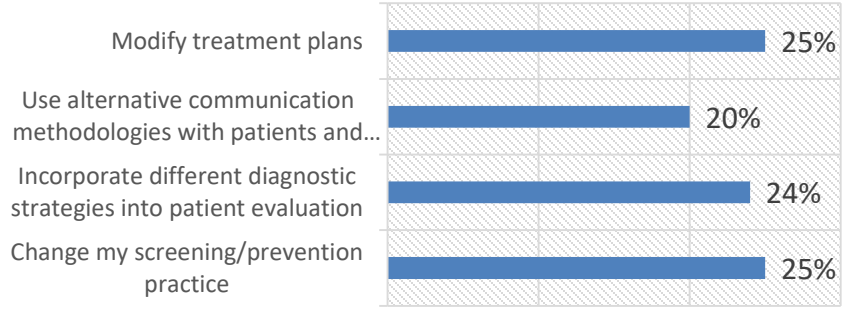
Online Enduring Evaluation Results

Level 4 Outcomes: Competence (Evaluation Results)

As a result of what I learned, I intend to make changes in my practice:



As a result of what I learned, I intend to make the following changes in my practice:



Note: 90% of Participants reported that they were somewhat or extremely likely to make a change in their practice

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Breathing Science is Life.

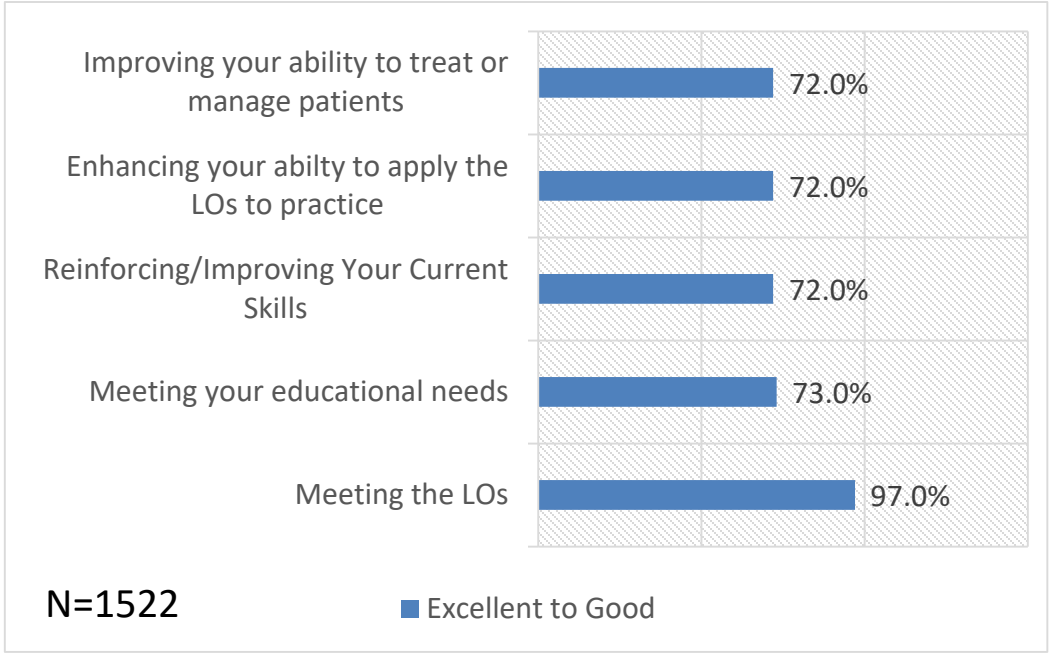
N=1522

Online Enduring Evaluation Results

National Jewish Health

Level 4 Outcomes: Competence (Evaluation Results)

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



Evaluation

- ✓ **99%** reported the material was presented without commercial bias
- ✓ **99%** reported the content presented was evidence-based and clinically relevant

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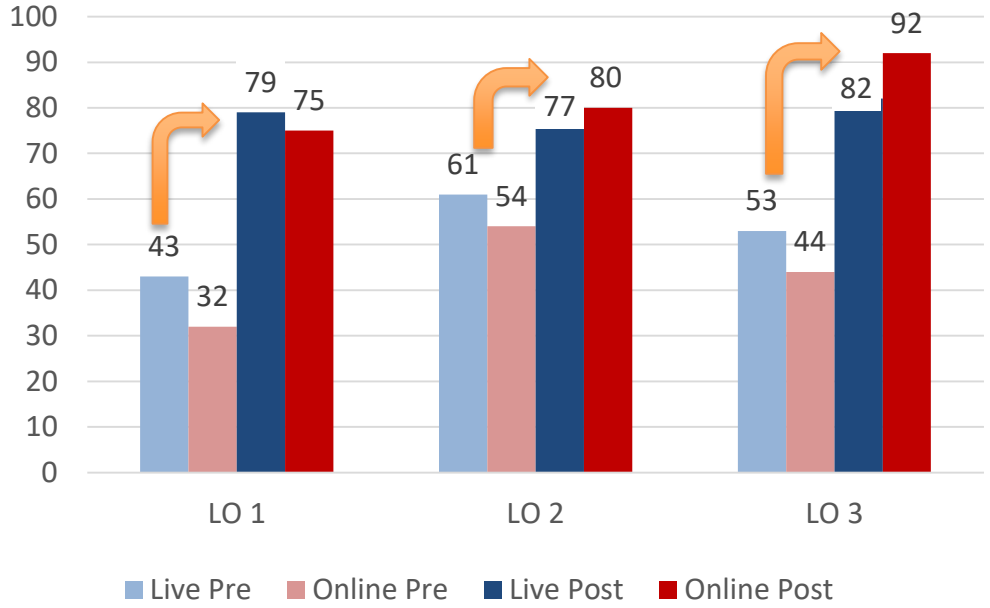
Breathing Science is Life.

Summary across Learning Objectives

Performance by learning objective reveals that live and online audiences saw relatively similar knowledge gains across learning objectives. The greatest gains were seen in LO's 1 and 3.

1. Describe key concepts in the pathophysiology of severe asthma and the features that are targets for biologic therapies.
2. Distinguish severe asthma from difficult-to-treat asthma with improved diagnostic and assessment strategies, including training in proper inhaler technique.
3. Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in severe asthma according to asthma subtype.

Persistent gaps reveal that both live and online audiences struggled to correctly identify biomarkers for the classification of asthma endotypes and phenotypes.



Final Report: Accreditation

National Jewish Health is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians; by the California Board of Registered Nursing to provide nursing contact hours for nurses; and by the American Board of Internal Medicine (ABIM) to provide Maintenance of Certification (MOC) points.

Accreditation Details: NJH designates the live and online program for 2 AMA PRA Category 1 Credits™ and 2 ABIM MOC points for physicians. NJH also designates the live program for 2.4 Nursing contact hours.