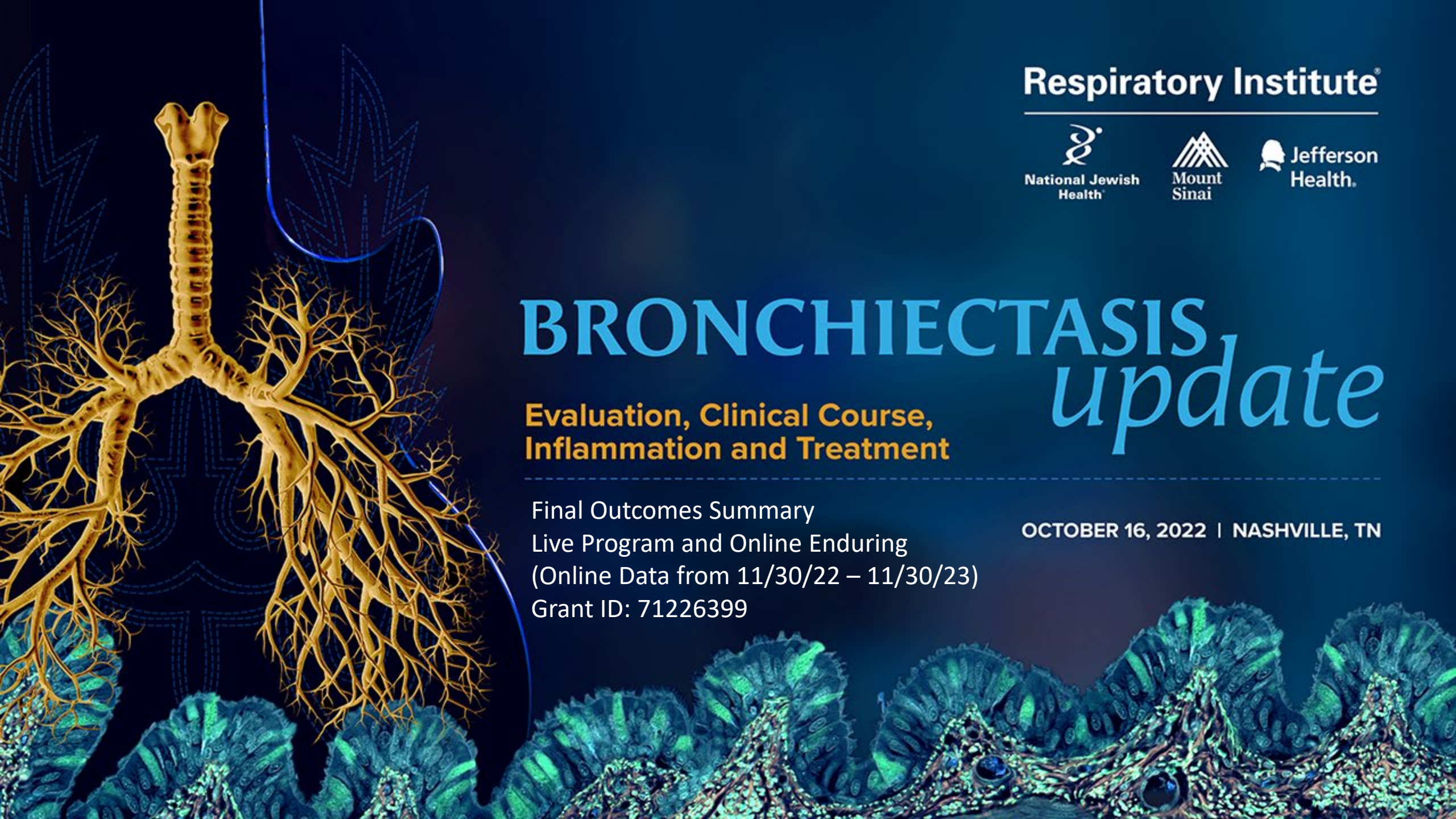


Final Outcomes Summary
Live Program and Online Enduring
(Online Data from 11/30/22 – 11/30/23)
Grant ID: 71226399

Table of Contents

Final Outcomes Summary – Online Outcomes and Live Symposium

Executive Summary

Final Outcomes Summary – Online Outcomes and Live Symposium

Charles Daley, MD
National Jewish Health

Jeffrey Hoag, MD
The Jane and Leonard Korman Respiratory Institute

Steven Lommatzsch, MD
National Jewish Health

Sarah Taimur, MD
Mount Sinai - National Jewish Health Respiratory Institute

Program Overview

Summary: This collaborative program brings together experts from National Jewish Health, Mount Sinai and Jefferson Health, for a 60-minute live CME Satellite Symposium on bronchiectasis that was presented on October 16, 2022 at the American College of Chest Physicians Annual Meeting (CHEST 2022) and endured on Medscape for one year.

Learning Objectives

1. Review bronchiectasis burden, etiologies, and best practices evaluation strategies.
2. Describe the clinical course and progression of bronchiectasis.
3. Describe the role of neutrophilic inflammation in patients with bronchiectasis.
4. Identify current and emerging treatments for patients with bronchiectasis.

Target Audience & Accreditation

Target Audience (Live symposium – CHEST): Pulmonologists
Target Audience (Enduring): Primary care physicians, pulmonologists, radiologists, and APPs in those specialties

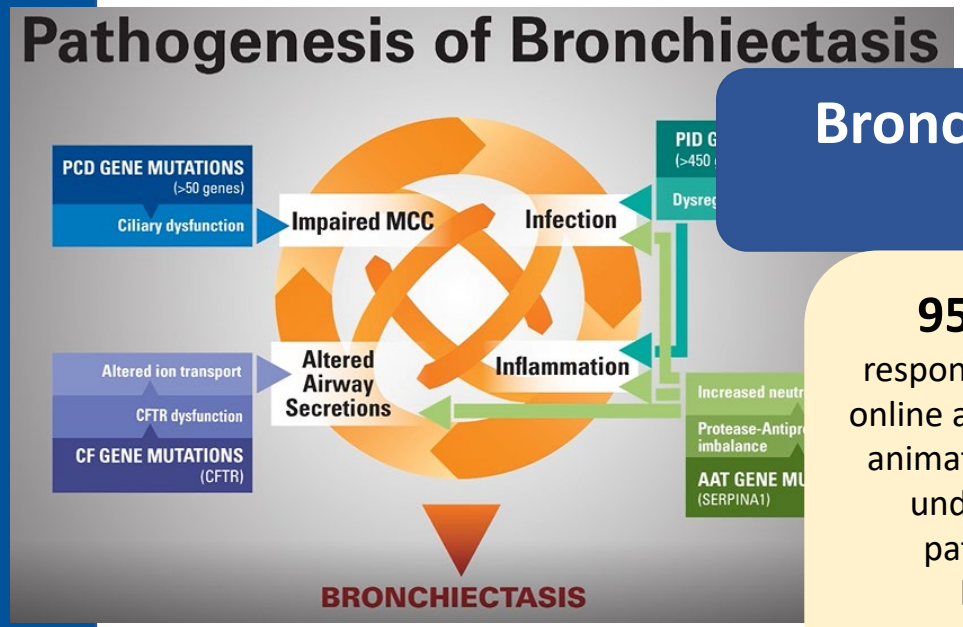
National Jewish Health designates the live and enduring activities for a maximum of 1.0 *AMA PRA Category 1 Credit™*.

Live activity date: October 16, 2022
Location: Omni Nashville Hotel, 250 Rep. John Lewis Way S, Nashville, TN 37203
Enduring activity: 11/30/2022 – 11/30/2023
https://www.medscape.org/viewarticle/984468

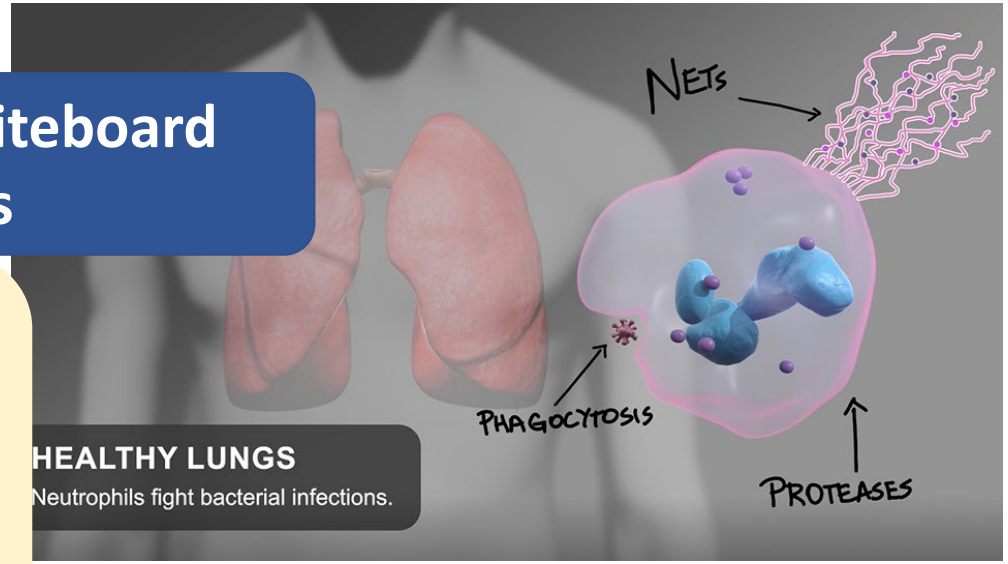
Program Features

Final Outcomes Summary – Online Outcomes and Live Symposium

National Jewish Health



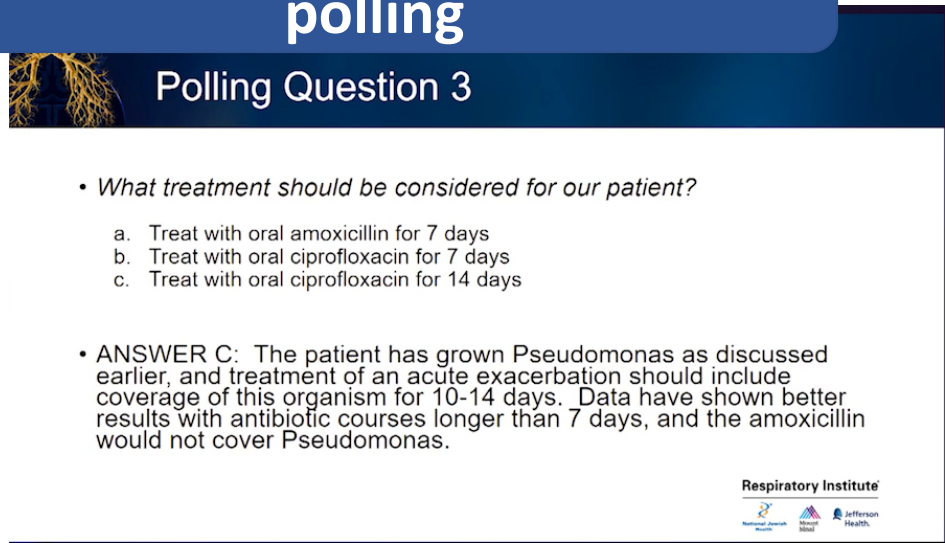
Bronchiectasis whiteboard animations



95% of evaluation respondents in the live and online activities reported the animations improved their understanding of the pathophysiology of bronchiectasis (N=1711)

Roundtable Q&A

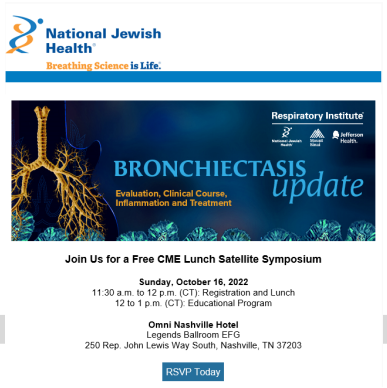
Case scenarios with interactive polling



Audience Generation

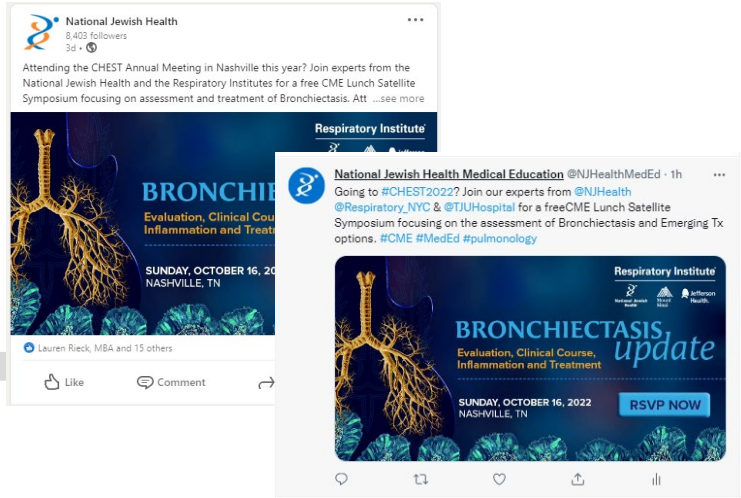
Final Outcomes Summary – Online Outcomes and Live Symposium

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).



Emails sent to CHEST registrants & National Jewish Health faculty (live); and to Medscape database (enduring)

Social media ads and posts



Medscape Smart Targeting and Search Engine Optimization (SEO)

Digital and print ads on CHEST website and Welcome Back Edition magazine

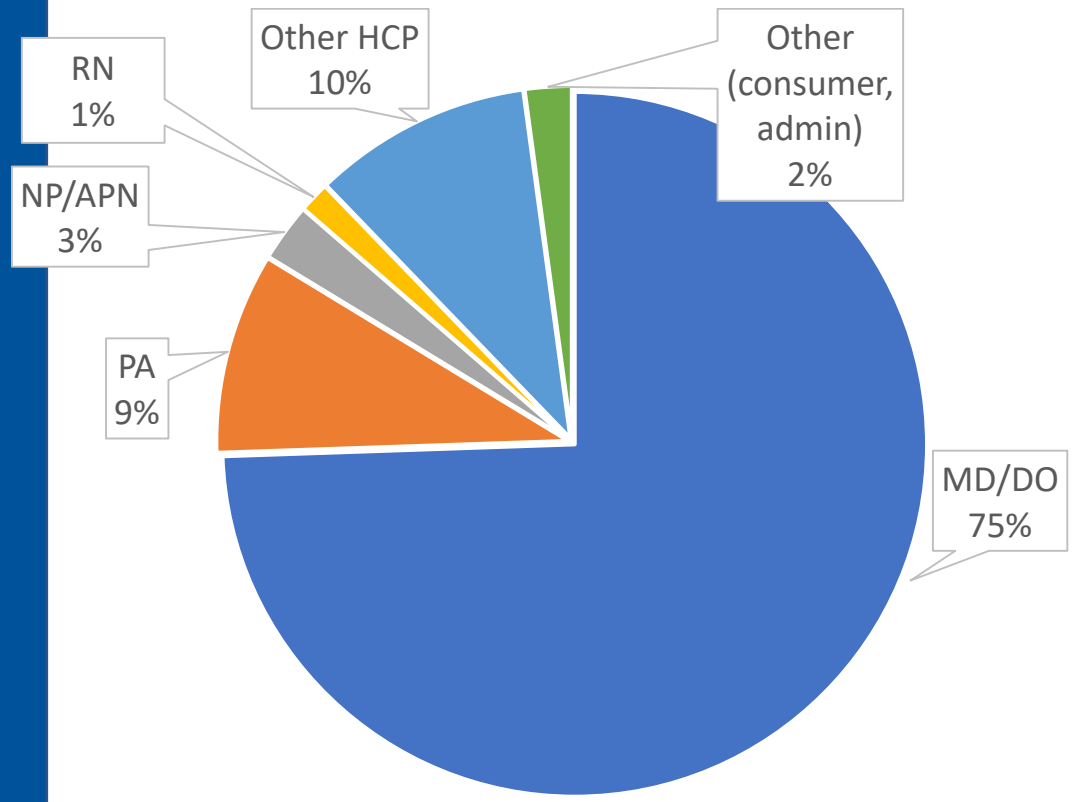
Dedicated landing page on National Jewish Health website and Medscape platform

Brochure mailing to CHEST registrants

Featured Event Listing on CHESTDailyNews.org

Overall Program Impact

Final Outcomes Summary – Online Outcomes and Live Symposium



87% of completers in the live and online activities were physicians and advanced practice providers

MD/DO=1420
PA=176
NP/APN=51
RN=27
Other HCP=192
Other (consumer, media, student)=41
Total completers=1907

More than doubled total learner guarantee!

82% of live learners were in the target audience *(pulmonologists)*
60% of physician learners in the online enduring program were in the target audience* *(pulmonologists, radiologists, and primary care)*

Learners	Guarantee	Actuals
Live Symposium	150	206
Online Enduring	3,130	7,429
Total	**3,280**	**7,635**

*Medscape only provides a breakdown of physician learners

Online Enduring Program

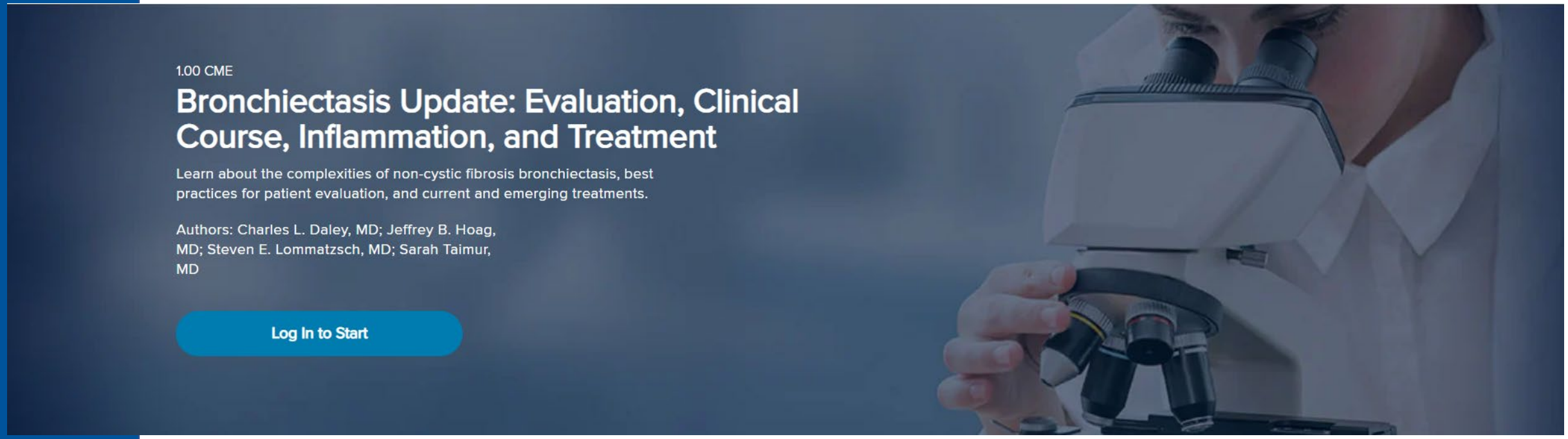
Final Outcomes Summary – Online Outcomes

National Jewish Health

Medscape

11/30/2023 – 11/30/2024

https://www.medscape.org/viewarticle/984468



Learner Definitions: Online Enduring Program

Final Outcomes Summary – Online Outcomes

National Jewish Health

Platform	Learner Definition	Learner Guarantees	Learner Actuals	Test-taker Definition	Test-taker Guarantees	Test-taker Actuals	Certificate Earner/ Completer Definition	Certificate Earner/ Completer Actuals
Medscape (data from 11/30/2022 – 11/30/2023)	Progressed past front-matter (unique)	3,130	7,429	Completed at least one question of the pre-test	400 physicians	2,063 physicians	Completed post-test and evaluation and claimed credit on Medscape platform	1,701
TOTAL		3,130 Learners	**7,429 Learners**		400 Physician test-takers	**2,063 Physician test-takers**		**1,701 Certificates/ Completers**

More than doubled **learner guarantees** and exceeded physician **test-taker guarantees by 1,663**!

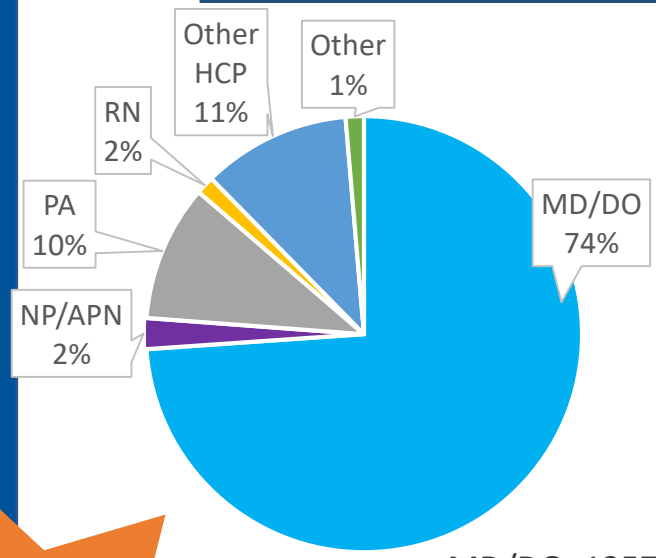
Of **5,400** physician learners, **60%** are from the target audience of primary care physicians, radiologists and pulmonologists!

Quantitative Educational Impact Summary

Final Outcomes Summary – Online Outcomes

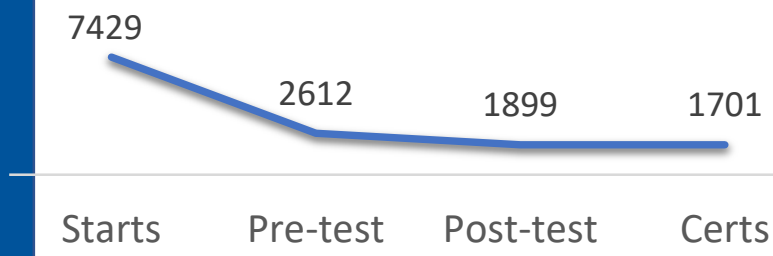
National Jewish Health

Learner Participation

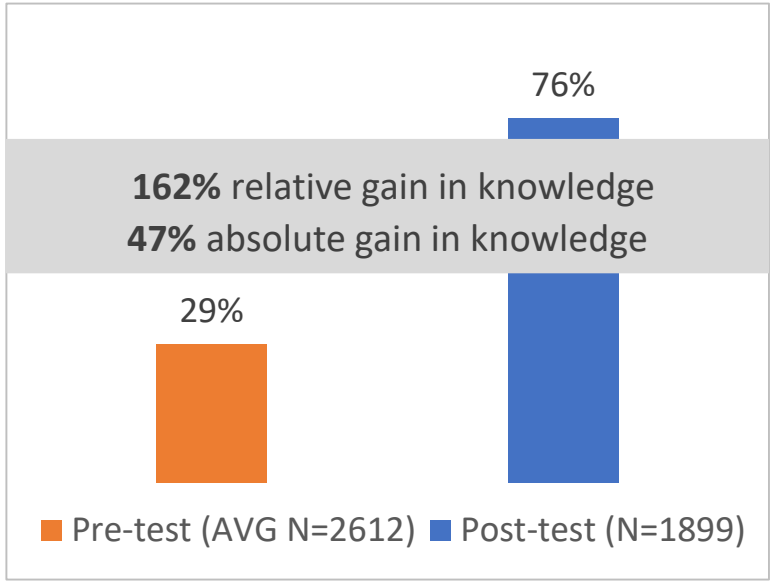


388,080 Potential patient visits impacted annually

MD/DO=1257
PA=172
NP/APN=39
RN=23
Other HCP=187
Other=23
Total Completers = 1701

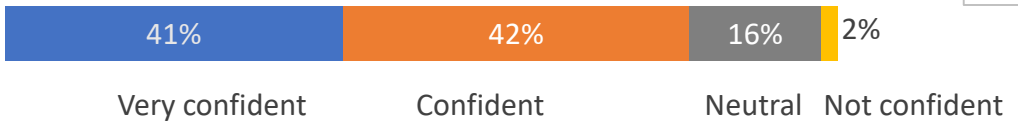


Learning Gain Across Objectives



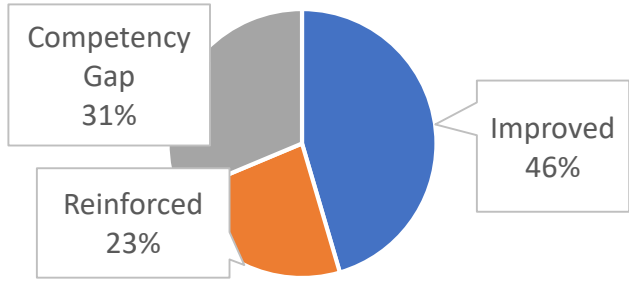
337% Relative Gain in Confidence Across LOs

Confidence @ Post-Test

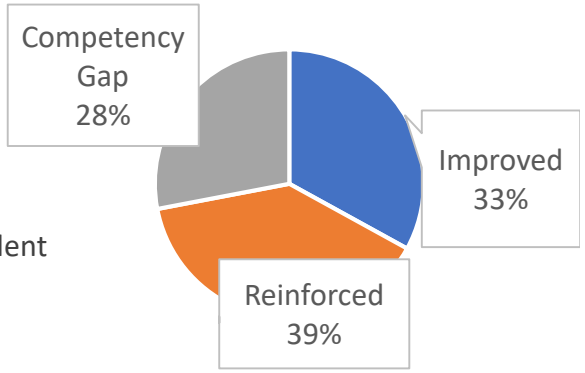


Persistent Learning Gaps/Needs

31% of learners were unable to identify best practice strategies for evaluating bronchiectasis at post-test



28% of learners were unable to identify emerging treatments for bronchiectasis at post-test



Quantitative Educational Impact Summary

Final Outcomes Summary – Online Outcomes

National Jewish Health®

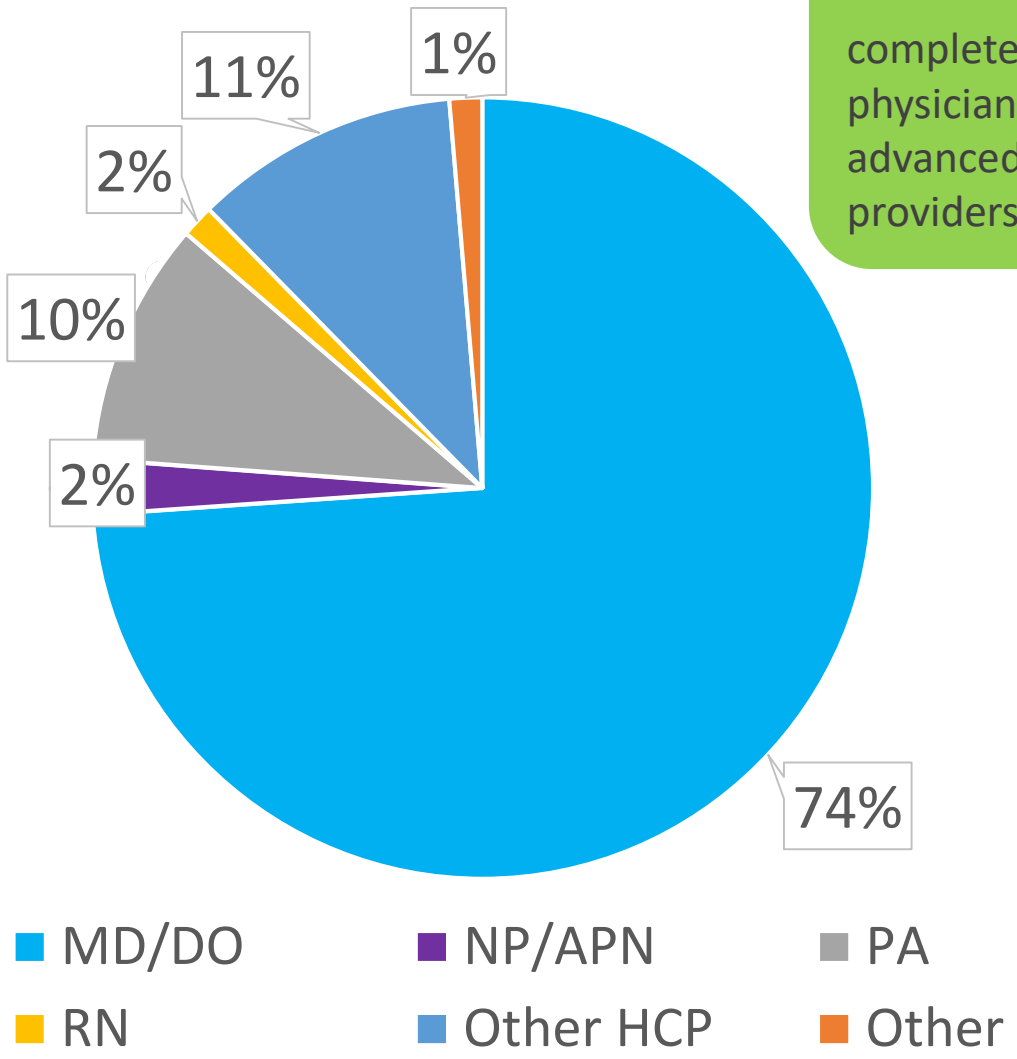
Patient Impact
1,619 evaluation respondents
Who see **8,085** Bronchiectasis patients weekly
Which translates to **388,080** potential patient visits impacted annually

Educational Impact
200% relative knowledge gain seen from learners in reviewing bronchiectasis burden, etiologies, and best practice evaluation strategies (N=1899)
305% relative knowledge gain in describing the clinical course and progression of bronchiectasis (N=1899)
146% relative knowledge gain seen from learners in describing the role of neutrophilic inflammation in patients with bronchiectasis (N=1899)
85% relative knowledge gain in identifying current and emerging treatments for patients with bronchiectasis (N=1899)

Practice Change
Top intended practice changes: • Follow guidelines for diagnosis and management of bronchiectasis • Prescribe airway clearance techniques • Order new labs and imaging • Consider emerging treatments when available
95% indicated the activity improved their ability to treat or manage their patients (N=1619)
337% relative gain in confidence across learning objectives (N=1619)

Quantitative Educational Impact Summary

Final Outcomes Summary – Online Outcomes



86% of completers were physicians and advanced practice providers

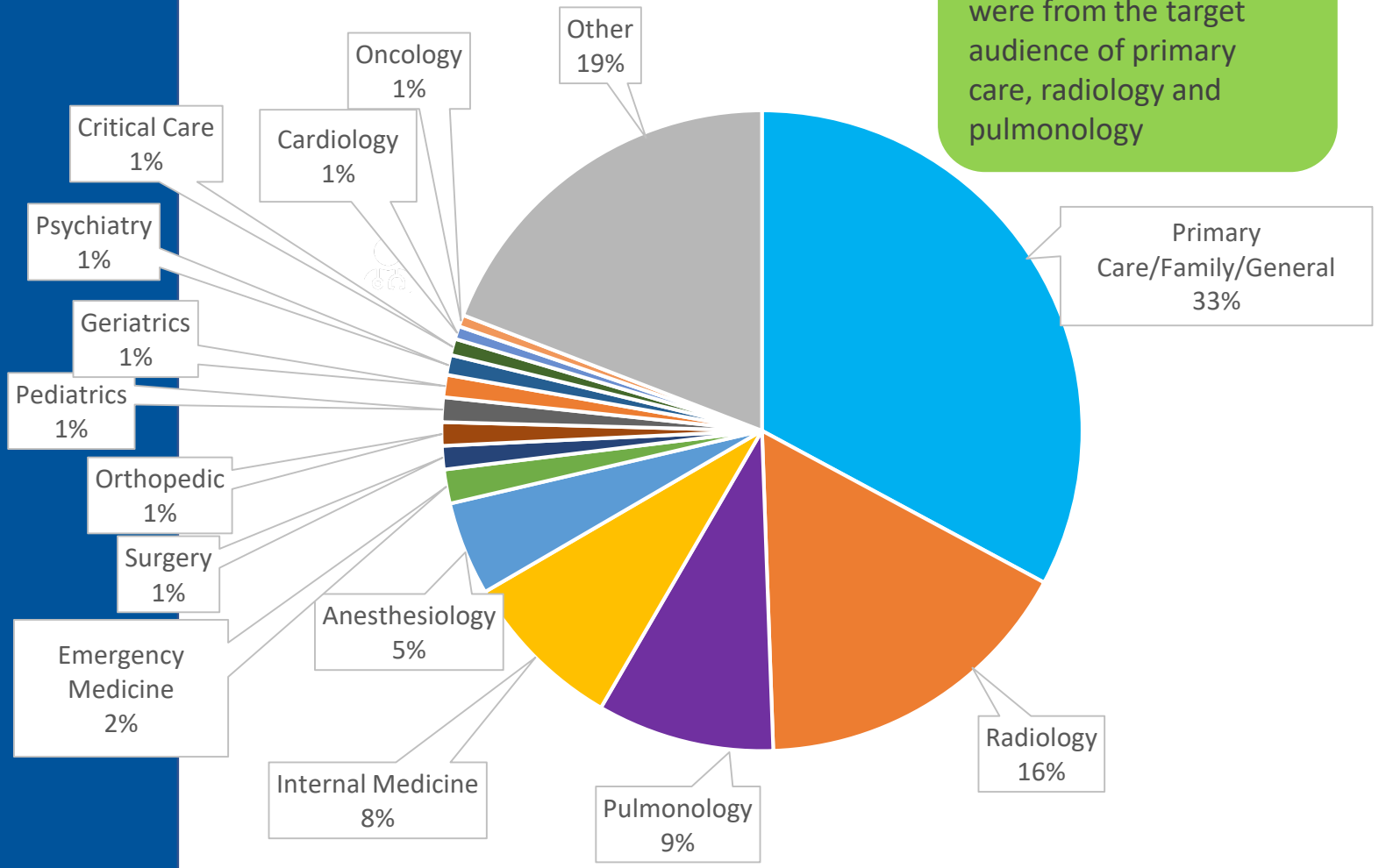
Degree	Total
MD/DO	1257
PA	172
NP/APN	39
RN	23
Other HCP	187
Other (medical student, consumer/patient, administration)	23
Total Completers	**1701**

Quantitative Educational Impact Summary

Final Outcomes Summary – Online Outcomes

National Jewish Health

66% of completers were from the target audience of primary care, radiology and pulmonology



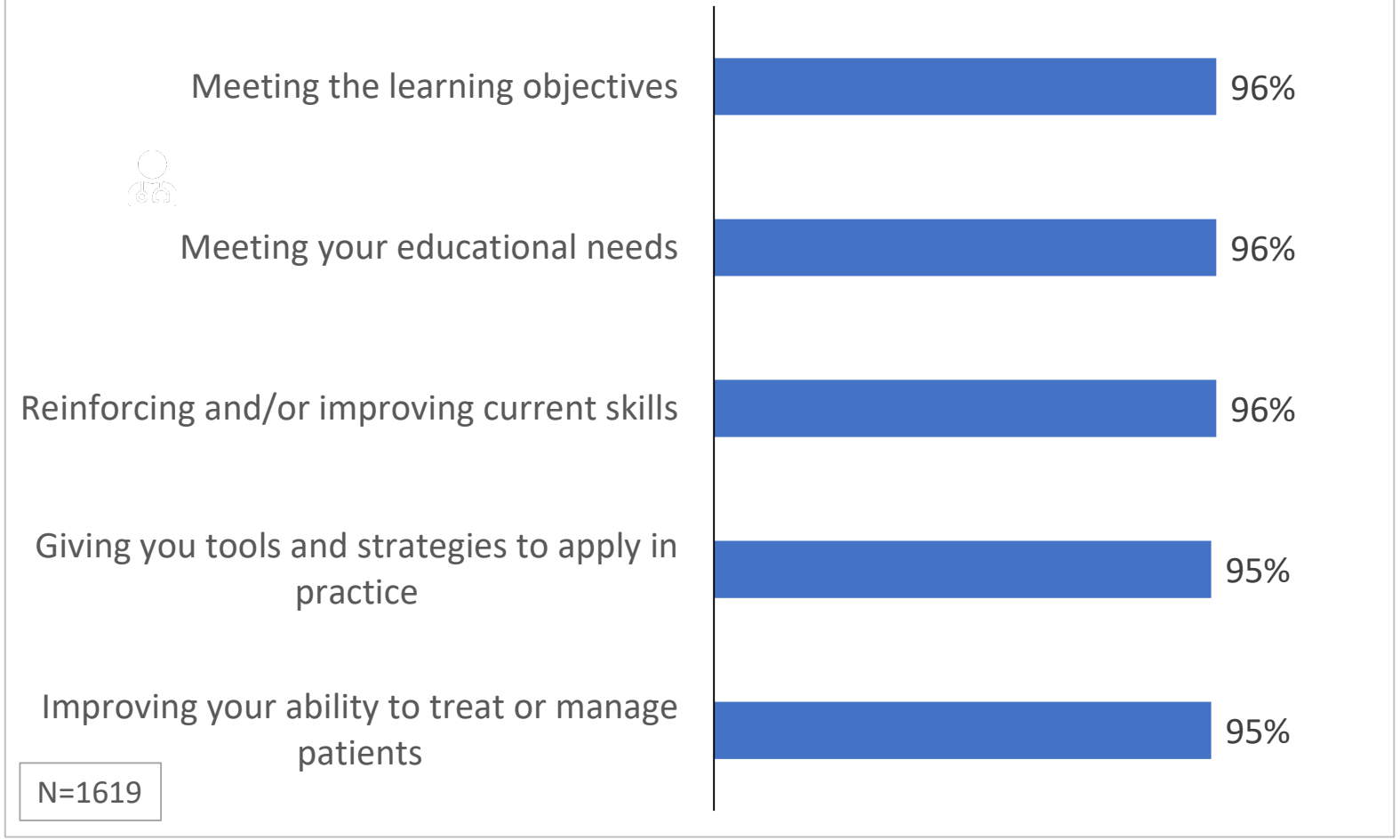
Specialty	Total
Primary Care/Family/General	555
Radiology	280
Pulmonology	151
Internal Medicine	139
Anesthesiology	80
Emergency	29
Pediatrics	21
Surgery	20
Orthopedic	20
Geriatrics	19
Psychiatry	17
Critical Care	14
Allergy	12
Cardiology	11
Oncology	10
Other *(Infectious disease, hospital medicine, otolaryngology, specialty not reported)*	323
Total Completers	**1701**

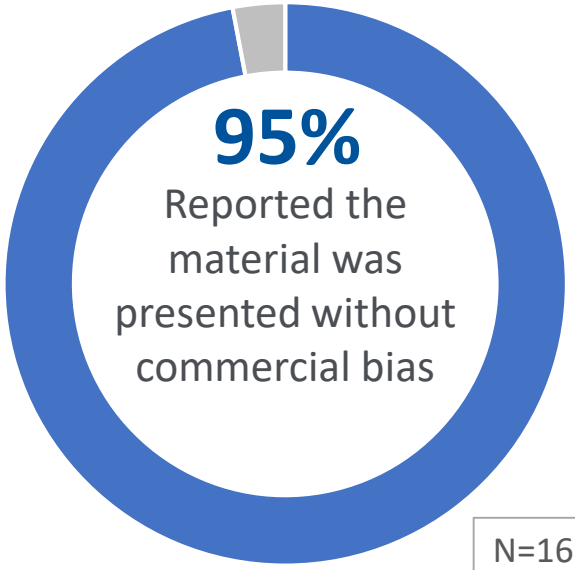
Quantitative Educational Impact Summary

Final Outcomes Summary – Online Outcomes

National Jewish Health

Evaluation respondents rated the activity "Excellent" or "Good" at:

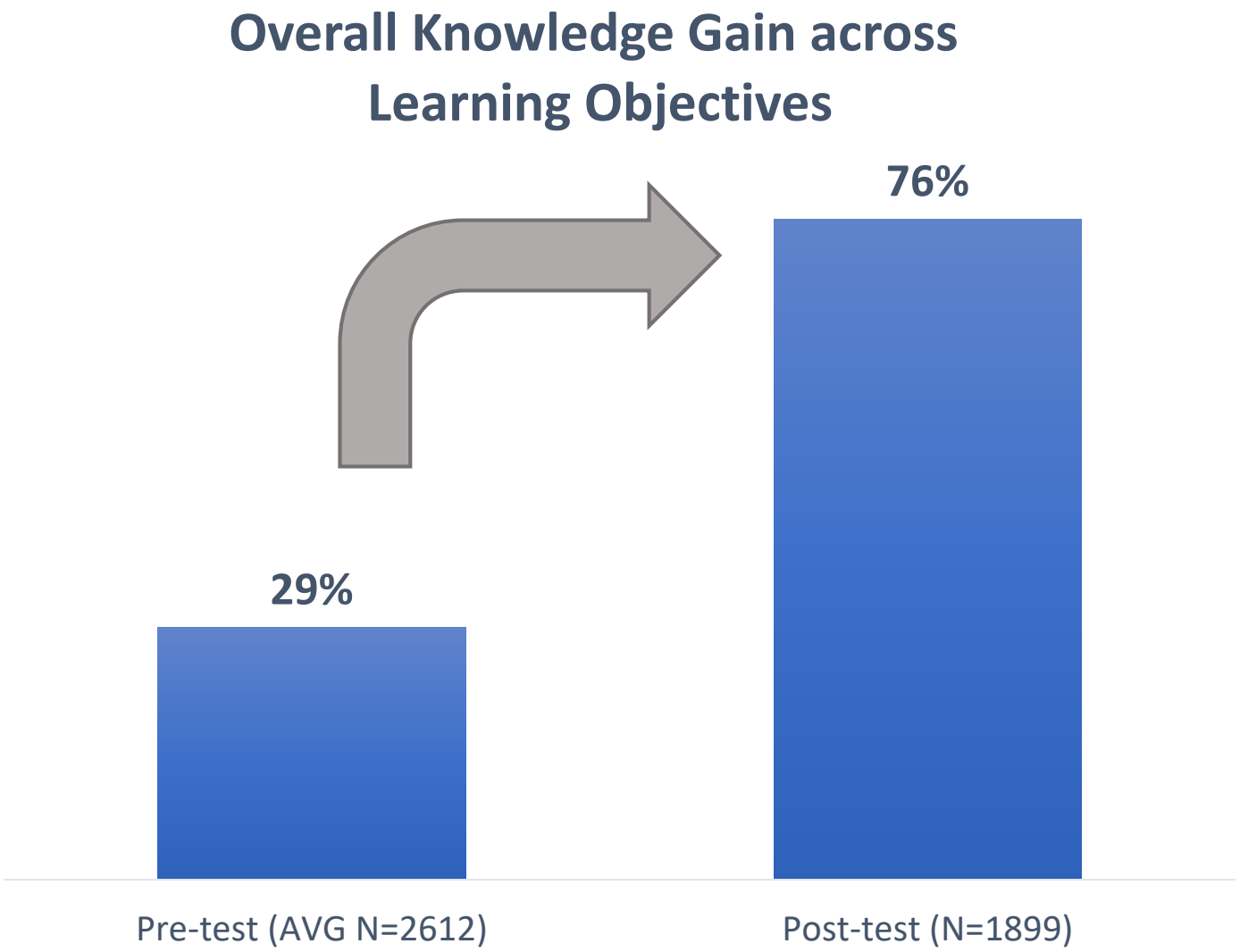




N=1619

Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Online Outcomes



162% Overall Relative Knowledge Gain

47% Overall Absolute Knowledge Gain

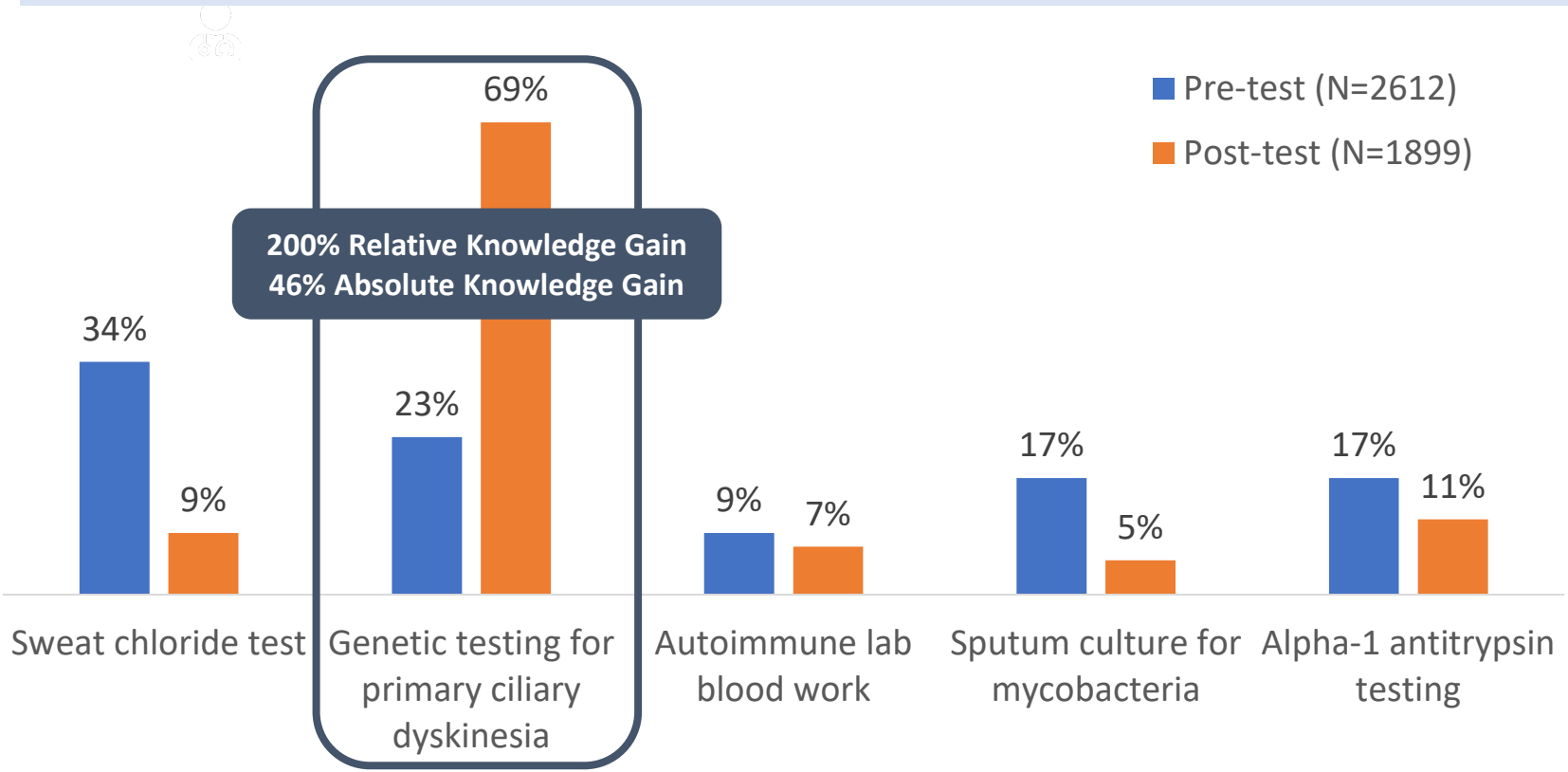
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Online Outcomes

National Jewish Health

Learning Objective: *Review bronchiectasis burden, etiologies, and best practice evaluation strategies.*

Question 1: A 37-year-old female patient with bronchiectasis presented for further evaluation of her disease. The patient states she had pneumonia in her first month of life, and then she had recurrent sinus and ear infections throughout childhood. The past 10 years she has been plagued with recurrent "bronchitis" and bouts of sinusitis, and her CT scan that was ordered shows bilateral lower lobe predominant bronchiectasis. What is the next step to evaluate the etiology of this patient's bronchiectasis?



Clinical Rationale: The best answer is B, genetic testing for primary ciliary dyskinesia (PCD). Her history of pneumonia in the first month of life and recurrent sinus and ear infections are very characteristic of PCD. The patient's bronchiectasis is lower lobe predominant, which is seen in PCD, hypogammaglobulinemia and alpha-1 antitrypsin (A1AT). Another good test to do as part of PCD evaluation would have been a nasal NO, but this test is only available at certain centers under research protocols. Endobronchial biopsy or nasal scrape biopsy to evaluate ciliary ultrastructure would be another test to consider, but there is a 30% false negative rate with biopsies.

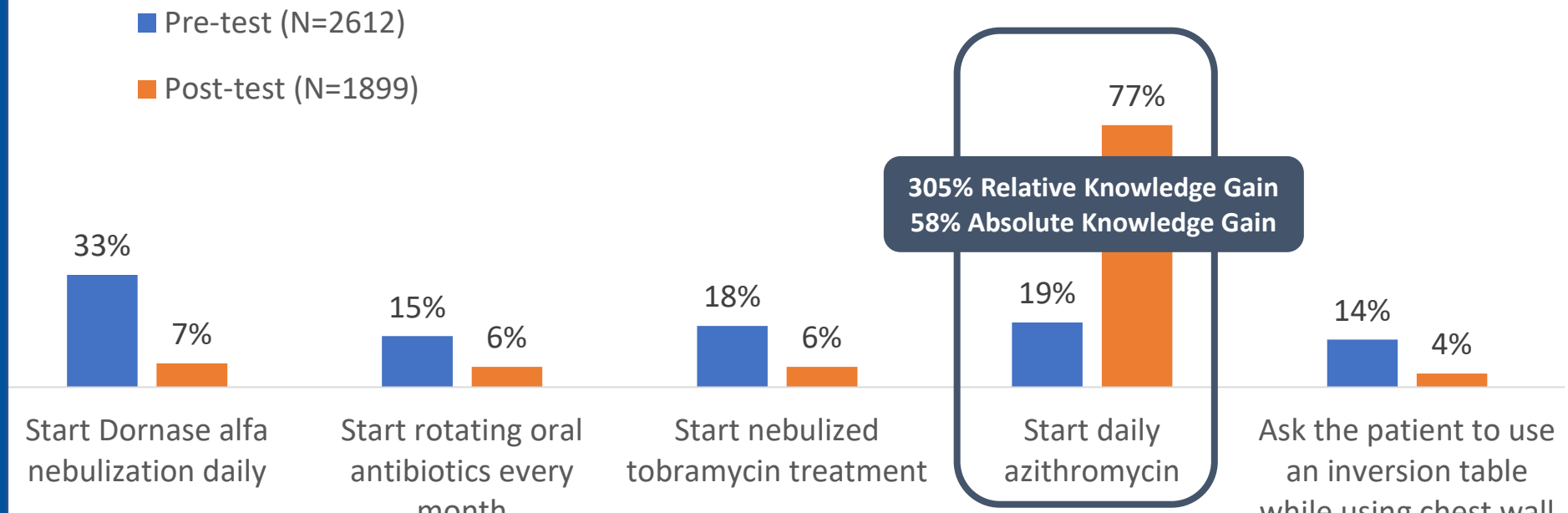
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Outcomes

Learning Objective: *Describe the clinical course and progression of bronchiectasis.*

Question 2: A 62-year-old patient with idiopathic bronchiectasis has been followed in clinic for 4 years with worsening lung function despite diligently using hypertonic saline nebulization, flutter valve, and chest wall oscillation device. The past two years she has had at least two bronchiectasis exacerbations requiring outpatient antibiotic therapy. Her sputum does not grow AFB organisms nor any *Pseudomonas*. What option could be a next step of therapy to help decrease her exacerbations?



Clinical Rationale: The best answer is D, start daily azithromycin, as multiple articles in the literature support using chronic macrolide therapy for its anti-inflammatory airway effects. The EMBRACE, BAT, and BLESS studies are three examples of chronic macrolide therapy decreasing bronchiectasis exacerbations.

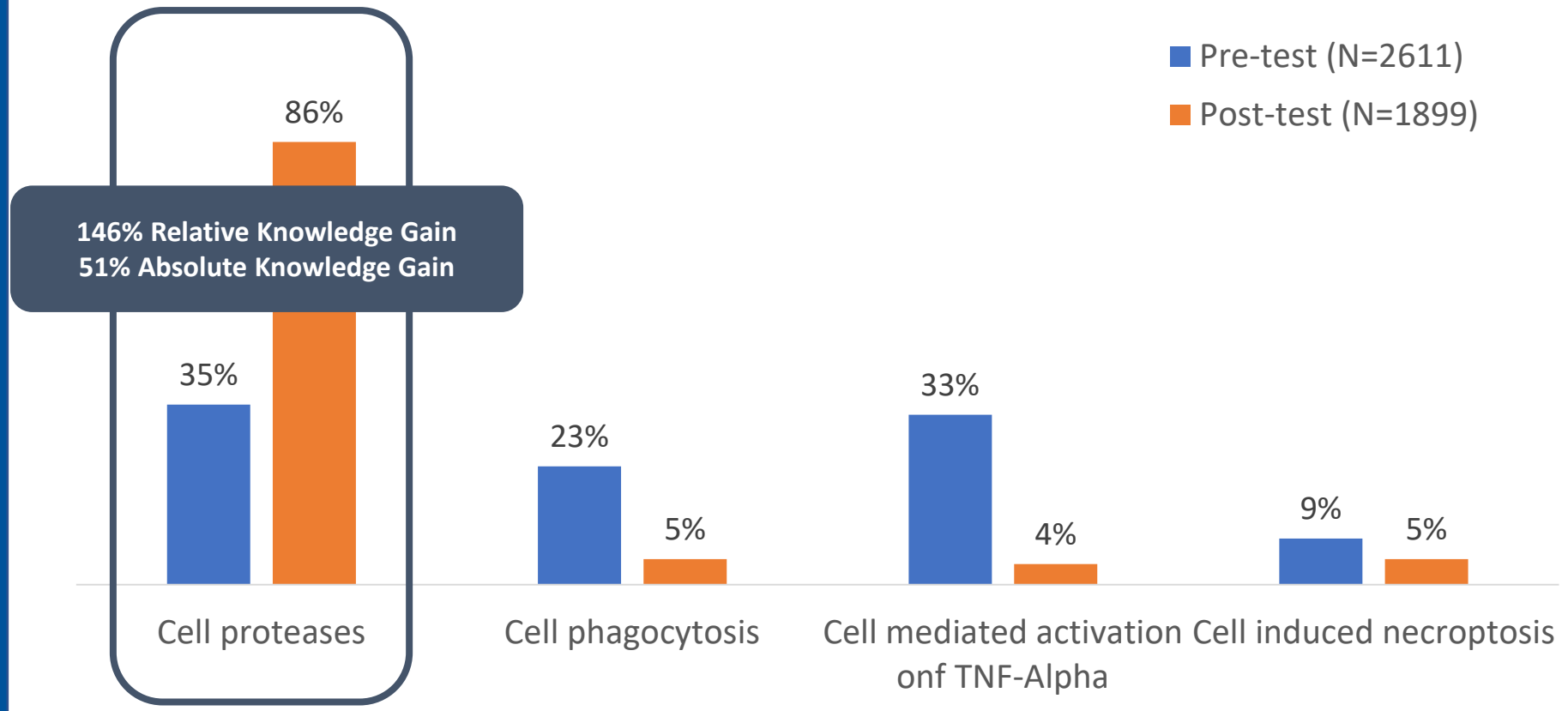
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Online Outcomes

National Jewish Health

Learning Objective: *Describe the role of neutrophilic inflammation in patients with bronchiectasis*

Question 3: The neutrophil typically is the predominant cell of inflammation in patients with bronchiectasis. What is the primary mechanism of airway damage from this inflammatory cell?



Clinical Rationale: The correct answer is A, cell proteases, since the neutrophil releases a variety of proteases causing inflammation and injury to the airway. Therapies have focused on ways to block this pathway of injury.

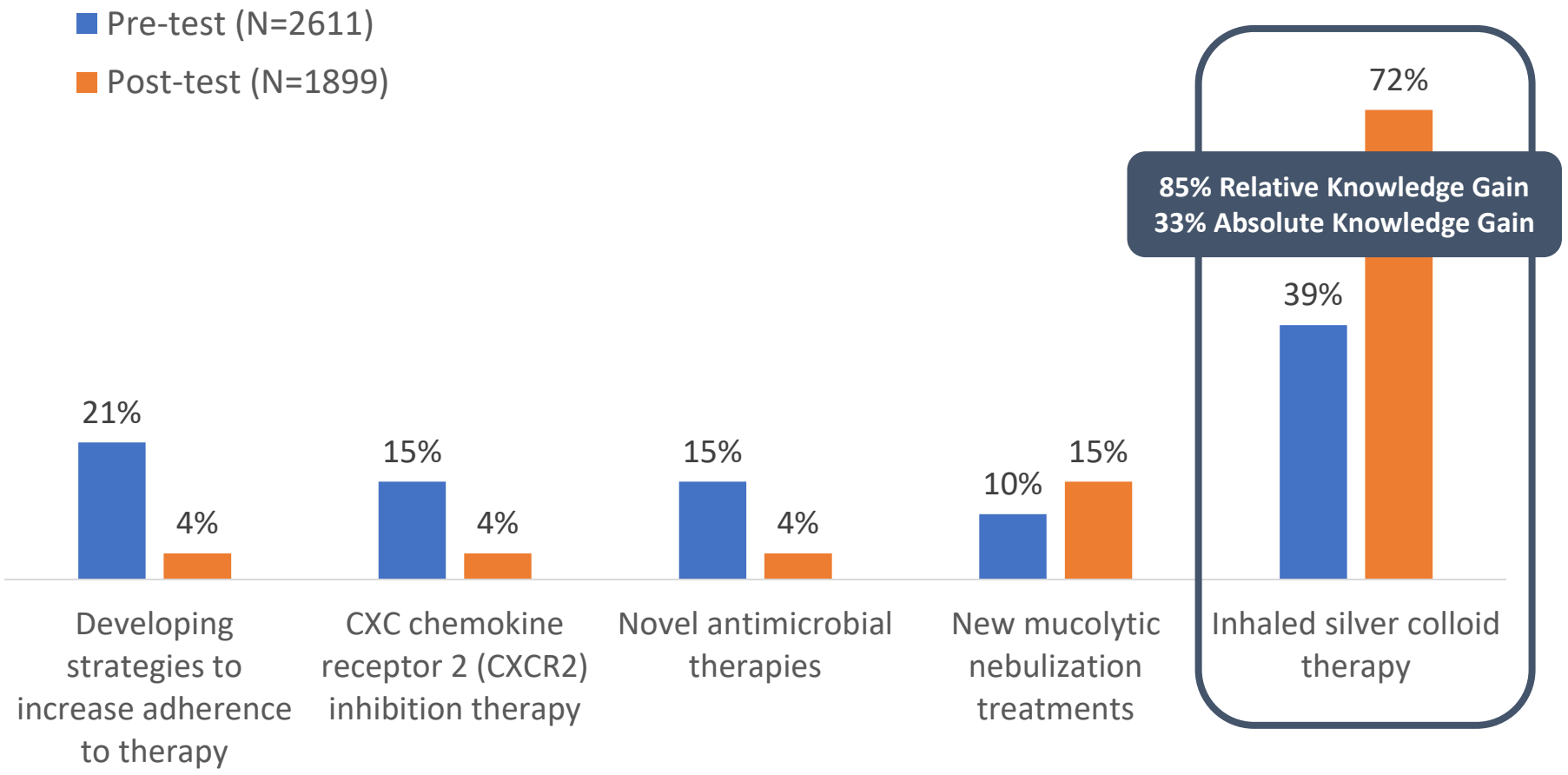
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary – Online Outcomes

Learning Objective: *Identify current and emerging treatments for patients with bronchiectasis*

Question 4: Idiopathic bronchiectasis is being more recognized as a significant pulmonary disorder that leads to morbidity. As patients of varying degrees of severity are identified, new therapies are being studied. The following are all being studied except for:

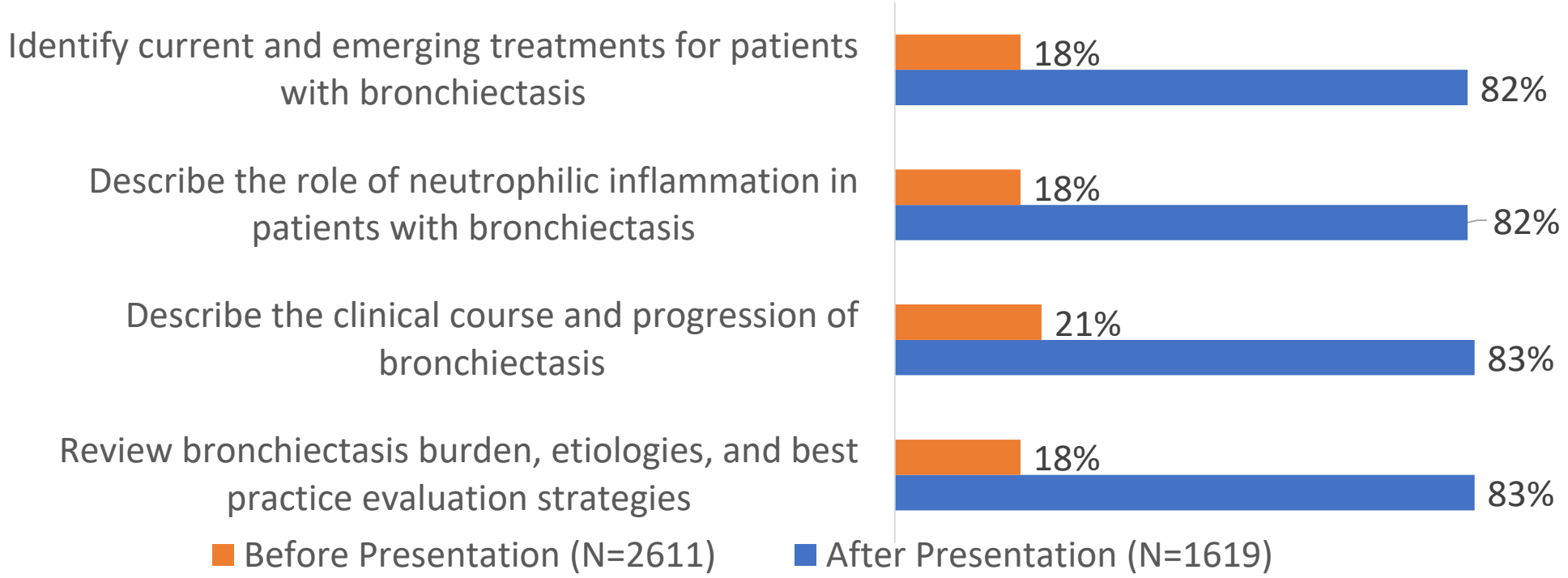


Clinical Rationale: The correct answer is E, as there has been some literature to show concerns about potential health hazards from silver nanomaterials (Int J Mol Sci. 2014 Dec; 15(12): 23936–23974).

Level (4) Outcomes: Competence

Final Outcomes Summary – Online Outcomes

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



Level (4) Outcomes: Competence

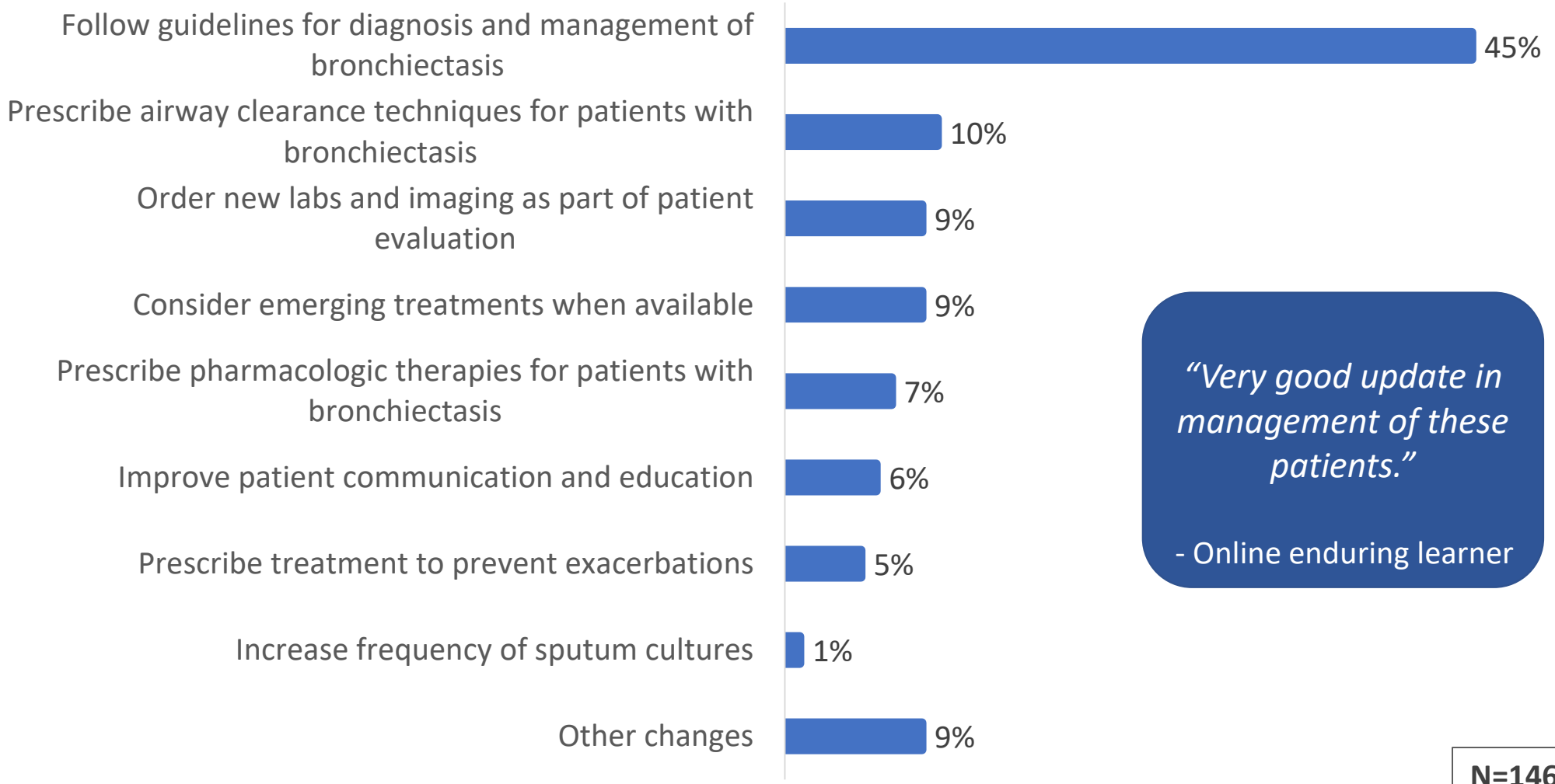
Final Outcomes Summary – Online Outcomes

91%

N=1619

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

Evaluation respondents reported the top change they intend to make in practice after participating in this activity:



"Very good update in management of these patients."

- Online enduring learner

N=1468

Evaluation Survey Results

Final Outcomes Summary – Online Outcomes

National Jewish Health

Key Takeaways

- Airway clearance is essential
- Emphasis on mucus clearance
- Bronchiectasis is a more complex disease than initially thought
- General diagnosis strategy and subsequent management
- Different strategies for managing bronchiectasis
- Following new guidelines
- How important my job as a respiratory therapist is for these patients
- How very difficult and time consuming the management of this disease is for patient and provider
- Proper diagnosis of etiology
- The role of neutrophils in this process
- To suspect bronchiectasis and make early diagnosis and treatment
- The importance of early intervention and CT
- Look for different causes of respiratory symptoms other than COPD
- The important role sputum culture results play in the treatment of bronchiectasis
- Increased understanding of the pathophysiology and treatment so that patients can also benefit from a more detailed explanation of the process
- It is important to individualize patient care based on patient needs

Evaluation Survey Results

Final Outcomes Summary – Online Outcomes

National Jewish Health

What barriers will the education provided help to address?

- Access to better care
- Adherence to scientific backed evidence and guidelines
- Cost is a major barrier, especially with the patient population
- Insurance issues
- Ensuring patient education and treatment goal reinforcement
- Establishing diagnosis and simplifying approach to treatment
- Identify and refer earlier to specialty care for this condition
- Patient communication and education
- Patient adherence
- Access to treatment and investigations
- New treatment modalities
- Current and ongoing management strategies
- Making airway clearance modalities more accessible

65%

N=1619

Evaluation respondents indicated the activity addressed strategies for overcoming barriers to optimal patient care

Live Symposium

Final Outcomes Summary

National Jewish Health

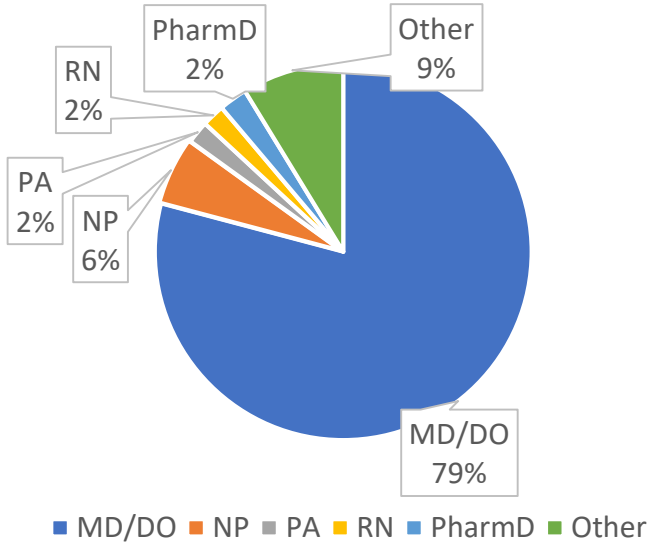
Sunday, October 16, 2022
Nashville, TN

Quantitative Educational Impact Summary

Final Outcomes Summary – Live Symposium

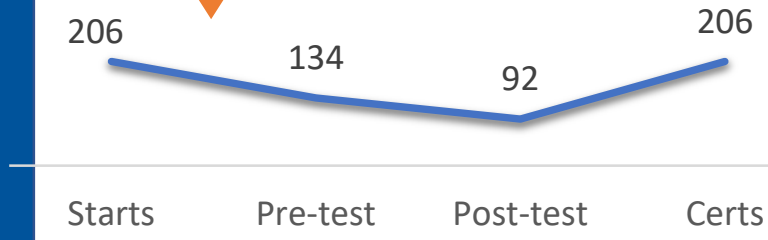
National Jewish Health

Participation

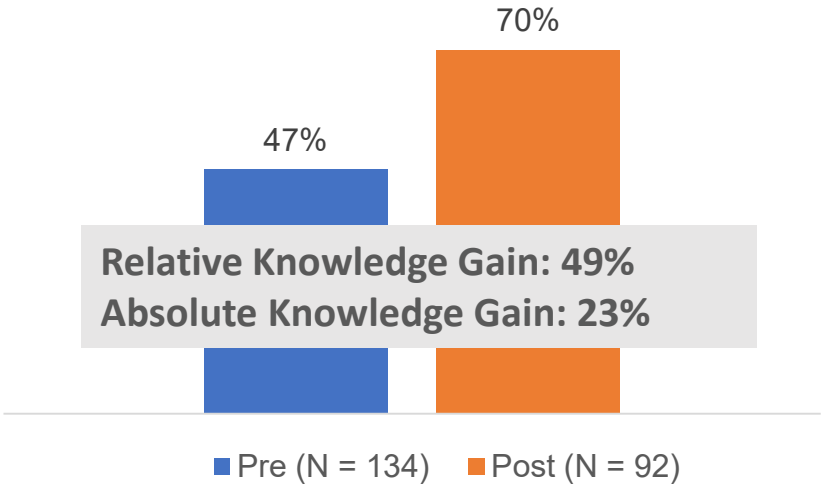


25,324 Potential patient visits impacted

MD/DO=163
NP=12
PA=4
RN=4
PharmD=5
Other=18
Total=206

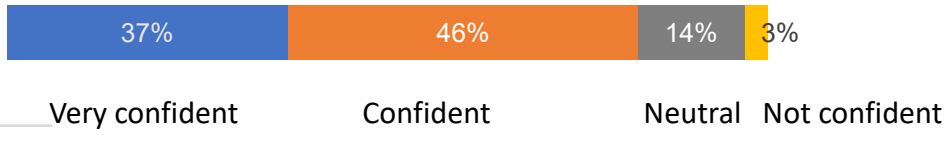


Learning Gain Across Objectives



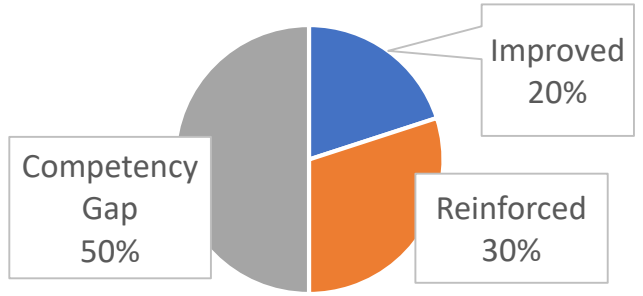
124% Relative Gain in Confidence Across LOs

Confidence @ Post-Test

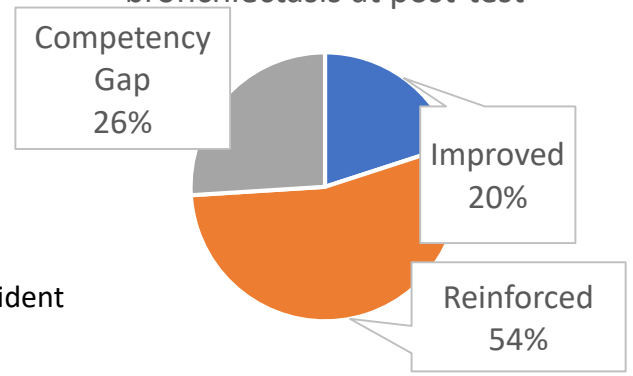


Persistent Learning Gaps/Needs

50% of learners were unable to identify best practice strategies for evaluating bronchiectasis at post-test



26% of learners were unable to describe the role of neutrophilic inflammation in patients with bronchiectasis at post-test



Qualitative Educational Impact Summary

Final Outcomes Summary – Live Symposium

National Jewish Health

Patient Impact

92

Evaluation respondents

Who see

487

Bronchiectasis Patients Weekly

Which translates to

25,324

Patient Visits Potentially Impacted Annually

Educational Impact

Knowledge and Competence Change by Learning Objective (N=92)

- ✓ Reviewing bronchiectasis burden, etiologies, and best practices evaluation strategies increased by **67%**
- ✓ Describing the clinical course and progression of bronchiectasis increased by **58%**
- ✓ Describing the role of neutrophilic inflammation in patients with bronchiectasis increased by **37%**
- ✓ Identify current and emerging treatments for patients with bronchiectasis increased by **39%**

Practice Change

98%

Reported intent to change their practice [N=92]

124%

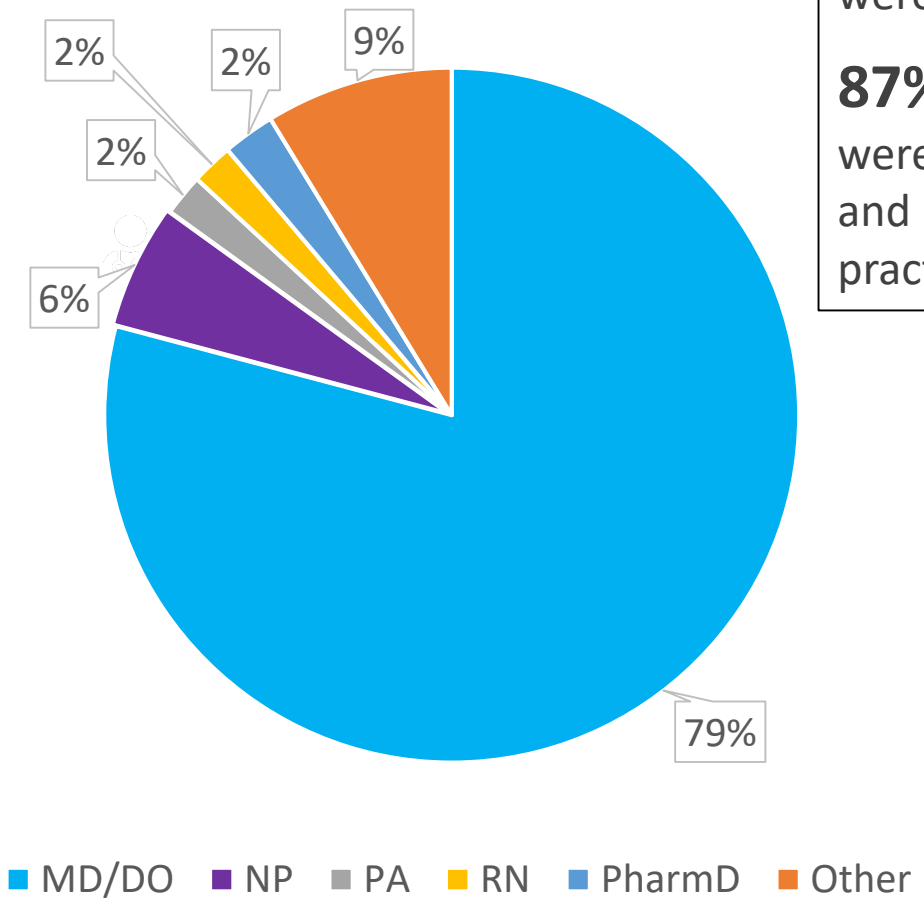
Overall relative confidence gain [N=92]

70%

Indicated the activity addressed strategies for overcoming barriers to optimal patient care [N=89]

Level (1) Outcomes: Participation (Degree)

Final Outcomes Summary – Live Symposium



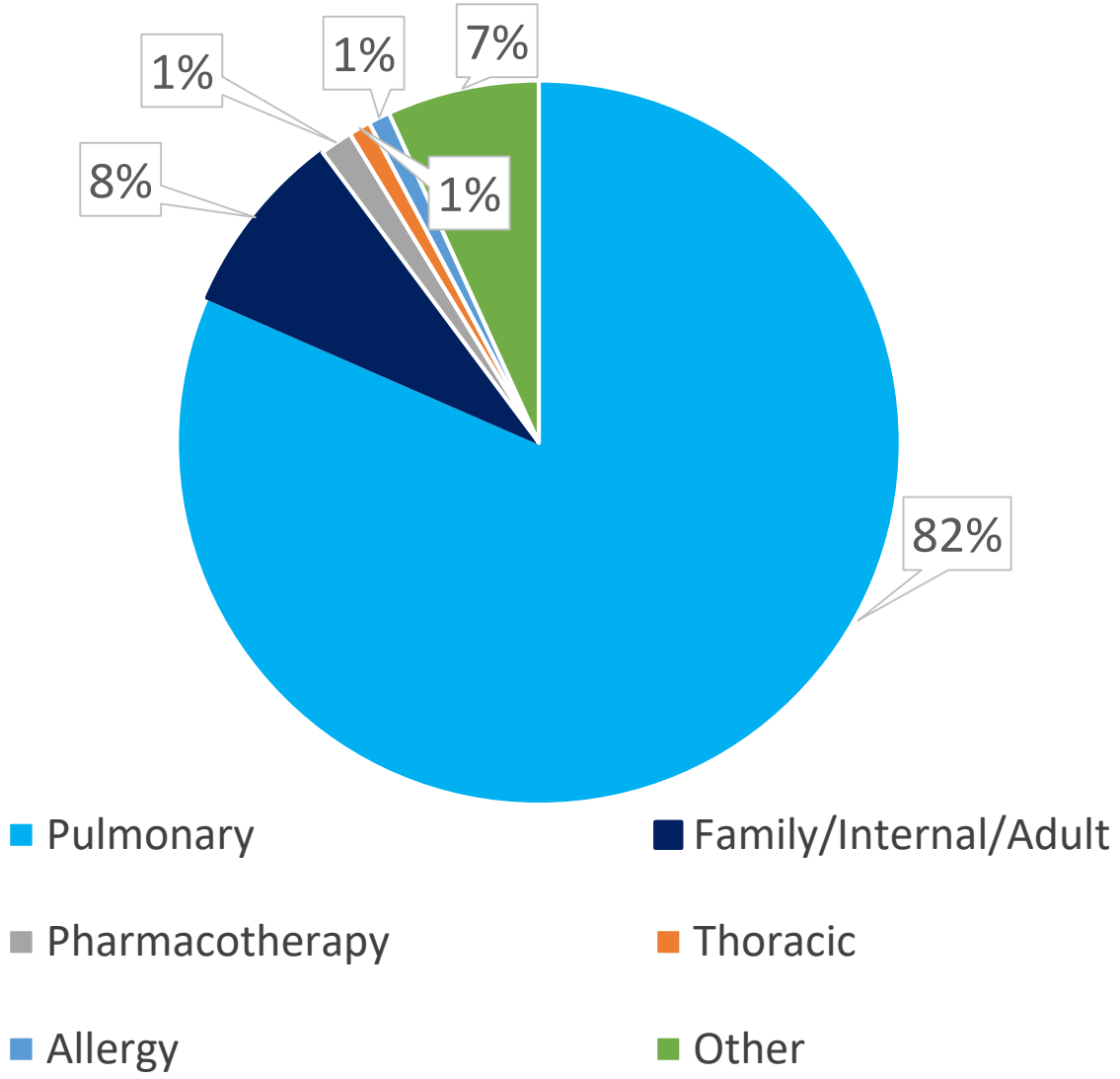
79% of learners were physicians

87% of learners were physicians and advanced practice providers

Degree	Total
MD/DO	163
NP	12
PA	4
RN	4
PharmD	5
Other	18
Total Learners	**206**

Level (1) Outcomes: Participation (Specialty)

Final Outcomes Summary – Live Symposium



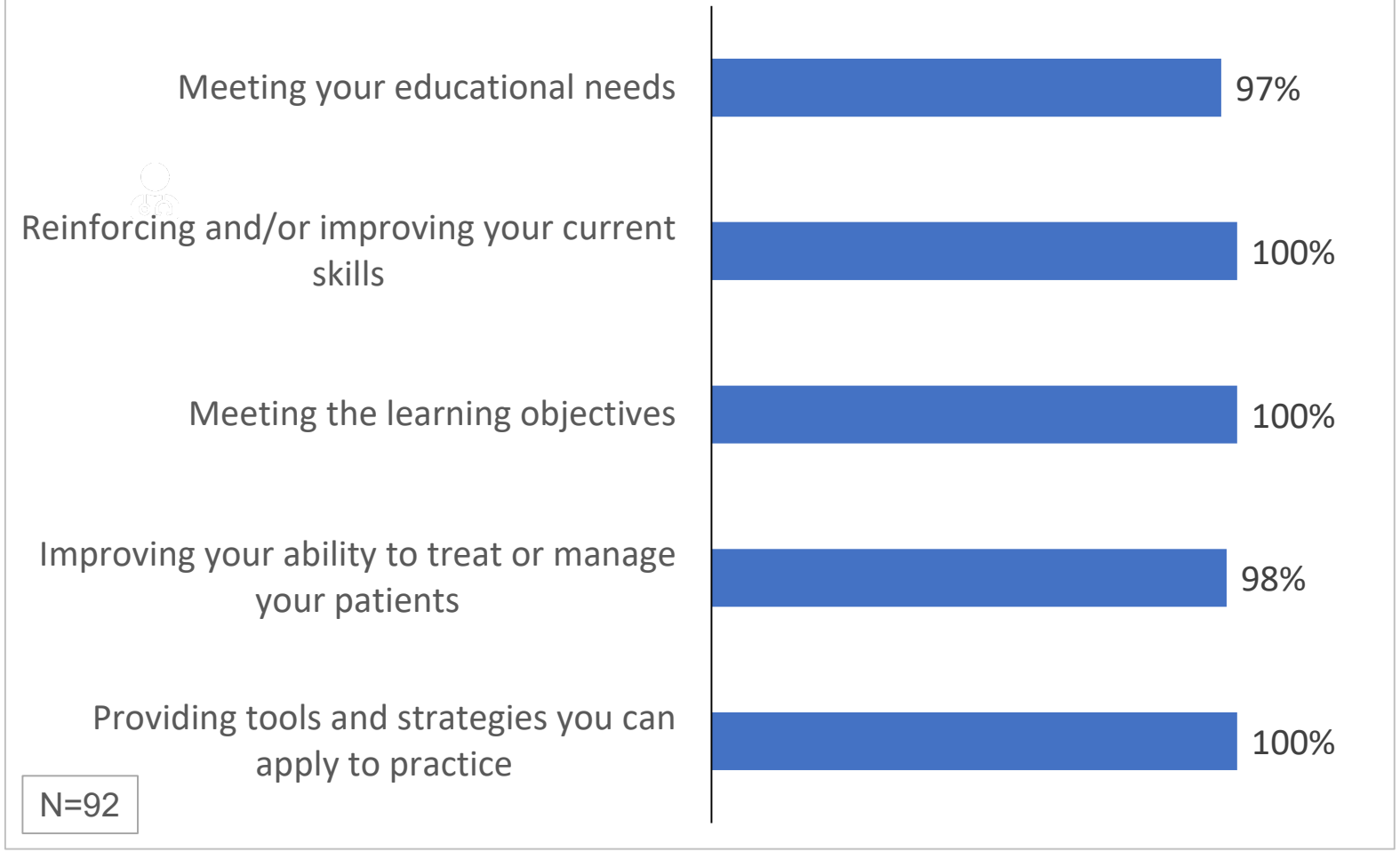
Degree	Total
Pulmonary	168
Family/Internal/Adult	17
Pharmacotherapy	3
Thoracic	2
Allergy	2
Other	14
Total Learners	**206**

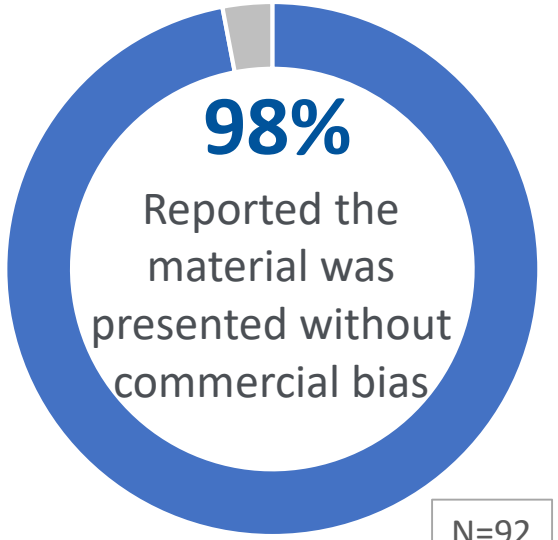
Level (2) Outcomes: Satisfaction

Final Outcomes Summary – Live Symposium

National Jewish Health

Evaluation Respondents rated the activity "Excellent" to "Good" at:



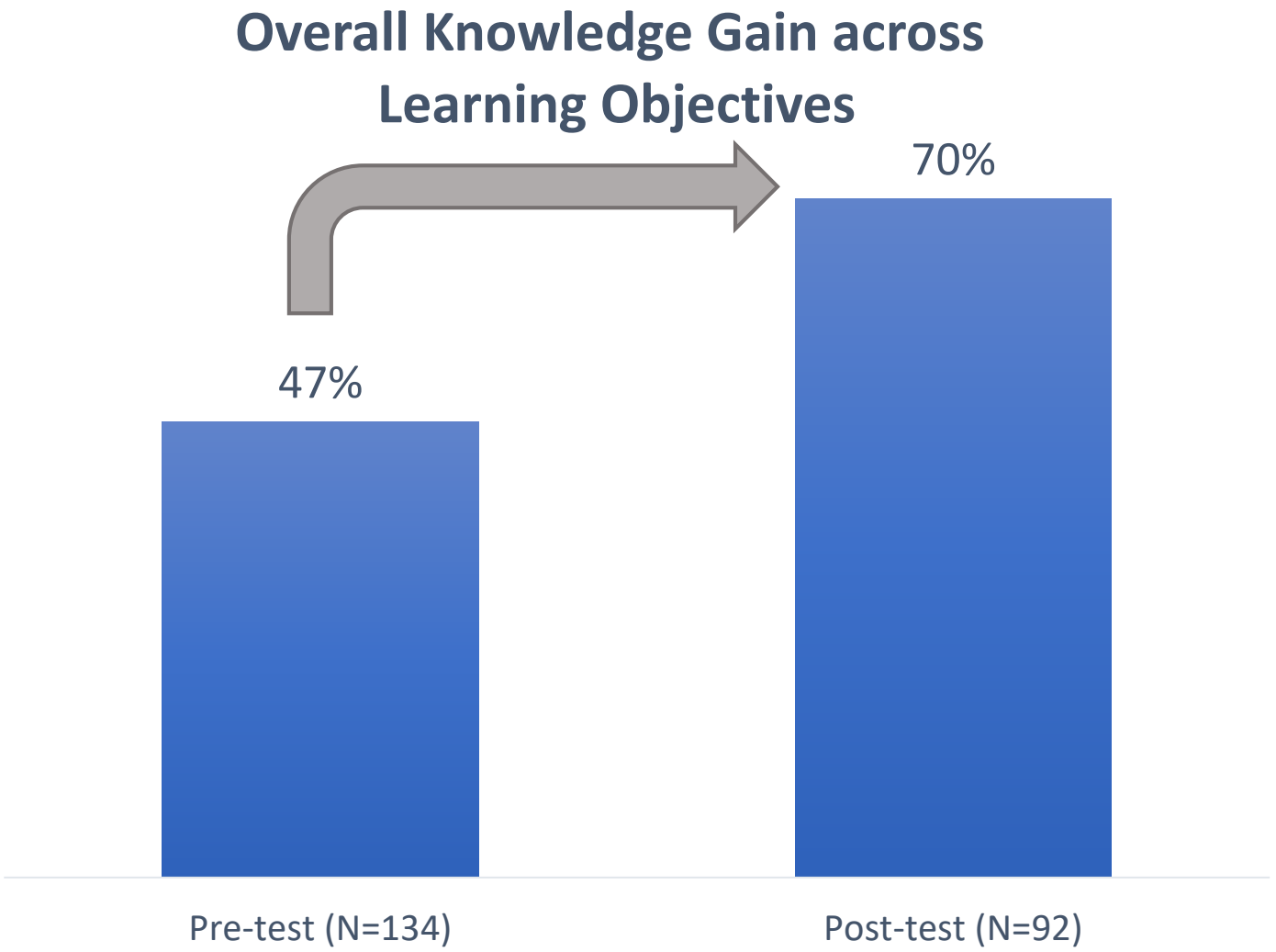


N=92

Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Live Symposium

National Jewish Health



49% Overall Relative Knowledge Gain

23% Overall Absolute Knowledge Gain

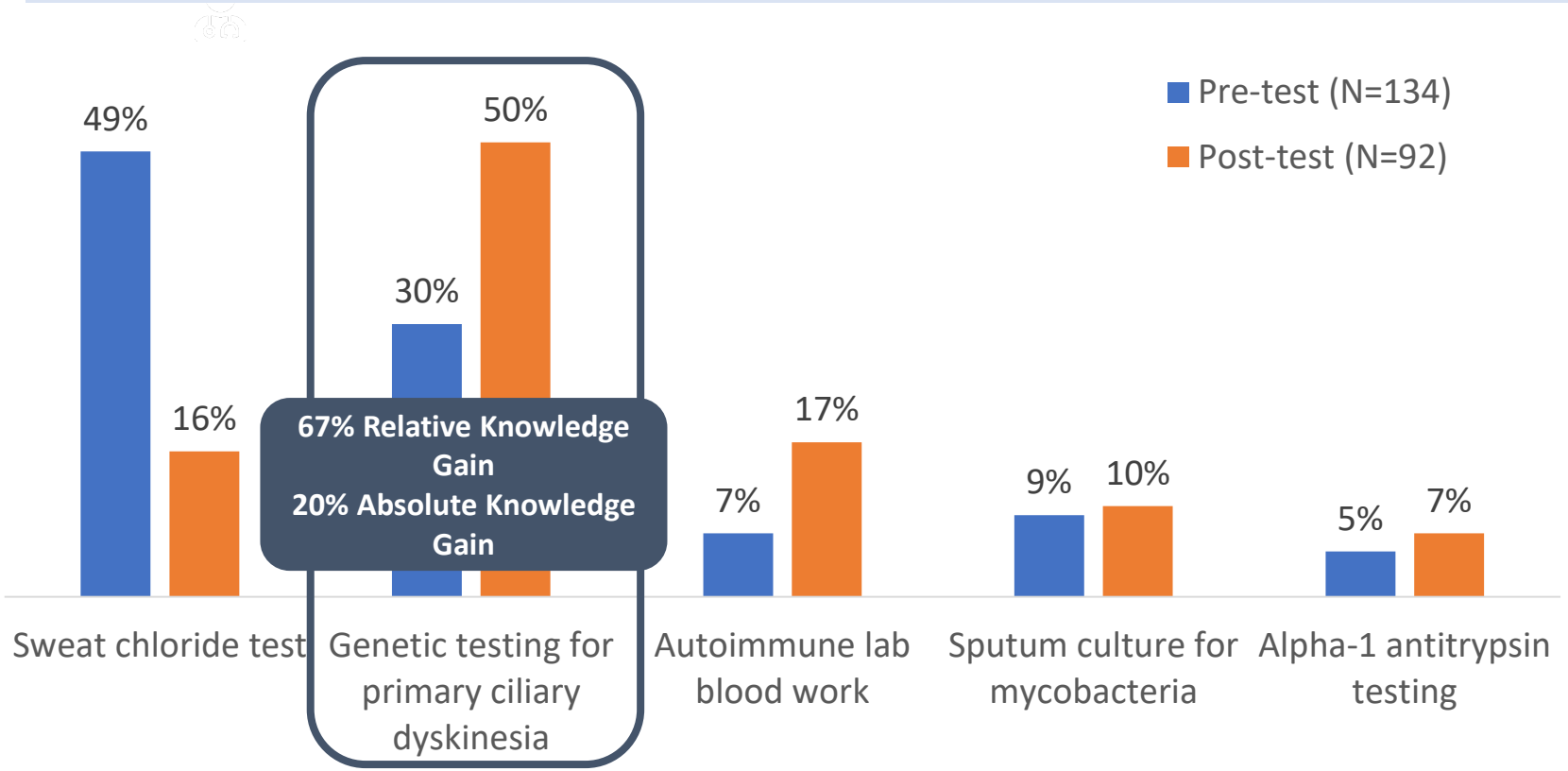
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Live Symposium

National Jewish Health

Learning Objective: *Review bronchiectasis burden, etiologies, and best practice evaluation strategies.*

Question 1: A 37-year-old female patient with bronchiectasis presented for further evaluation of her disease. The patient states she had pneumonia in her first month of life, and then she had recurrent sinus and ear infections throughout childhood. The past 10 years she has been plagued with recurrent "bronchitis" and bouts of sinusitis, and her CT scan that was ordered shows bilateral lower lobe predominant bronchiectasis. What is the next step to evaluate the etiology of this patient's bronchiectasis?



Clinical Rationale: The best answer is B, genetic testing for primary ciliary dyskinesia (PCD). Her history of pneumonia in the first month of life and recurrent sinus and ear infections are very characteristic of PCD. The patient's bronchiectasis is lower lobe predominant, which is seen in PCD, hypogammaglobulinemia and alpha-1 antitrypsin (A1AT). Another good test to do as part of PCD evaluation would have been a nasal NO, but this test is only available at certain centers under research protocols. Endobronchial biopsy or nasal scrape biopsy to evaluate ciliary ultrastructure would be another test to consider, but there is a 30% false negative rate with biopsies.

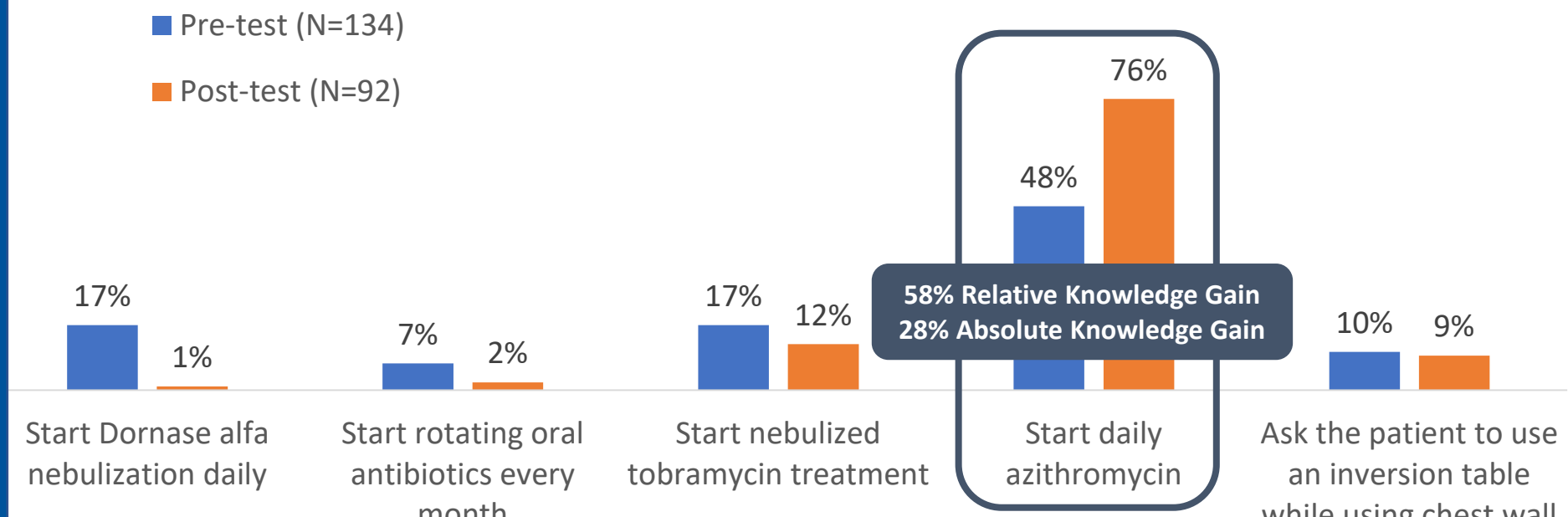
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Live Symposium

National Jewish Health

Learning Objective: *Describe the clinical course and progression of bronchiectasis.*

Question 2: A 62-year-old patient with idiopathic bronchiectasis has been followed in clinic for 4 years with worsening lung function despite diligently using hypertonic saline nebulization, flutter valve, and chest wall oscillation device. The past two years she has had at least two bronchiectasis exacerbations requiring outpatient antibiotic therapy. Her sputum does not grow AFB organisms nor any Pseudomonas. What option could be a next step of therapy to help decrease her exacerbations?



Clinical Rationale: The best answer is D, start daily azithromycin, as multiple articles in the literature support using chronic macrolide therapy for its anti-inflammatory airway effects. The EMBRACE, BAT, and BLESS studies are three examples of chronic macrolide therapy decreasing bronchiectasis exacerbations.

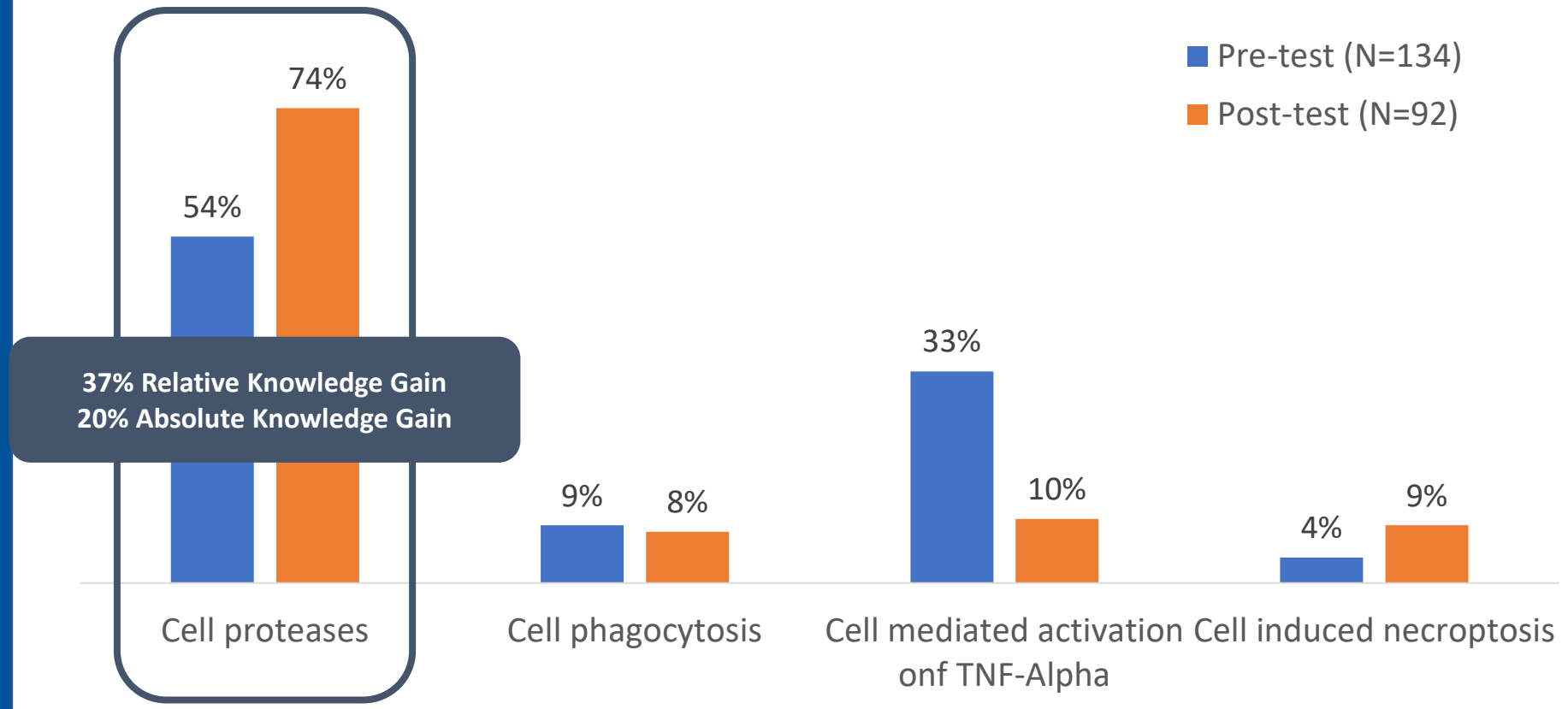
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Live Symposium

National Jewish Health

Learning Objective: *Describe the role of neutrophilic inflammation in patients with bronchiectasis*

Question 3: The neutrophil typically is the predominant cell of inflammation in patients with bronchiectasis. What is the primary mechanism of airway damage from this inflammatory cell?



Clinical Rationale: The correct answer is A, cell proteases, since the neutrophil releases a variety of proteases causing inflammation and injury to the airway. Therapies have focused on ways to block this pathway of injury.

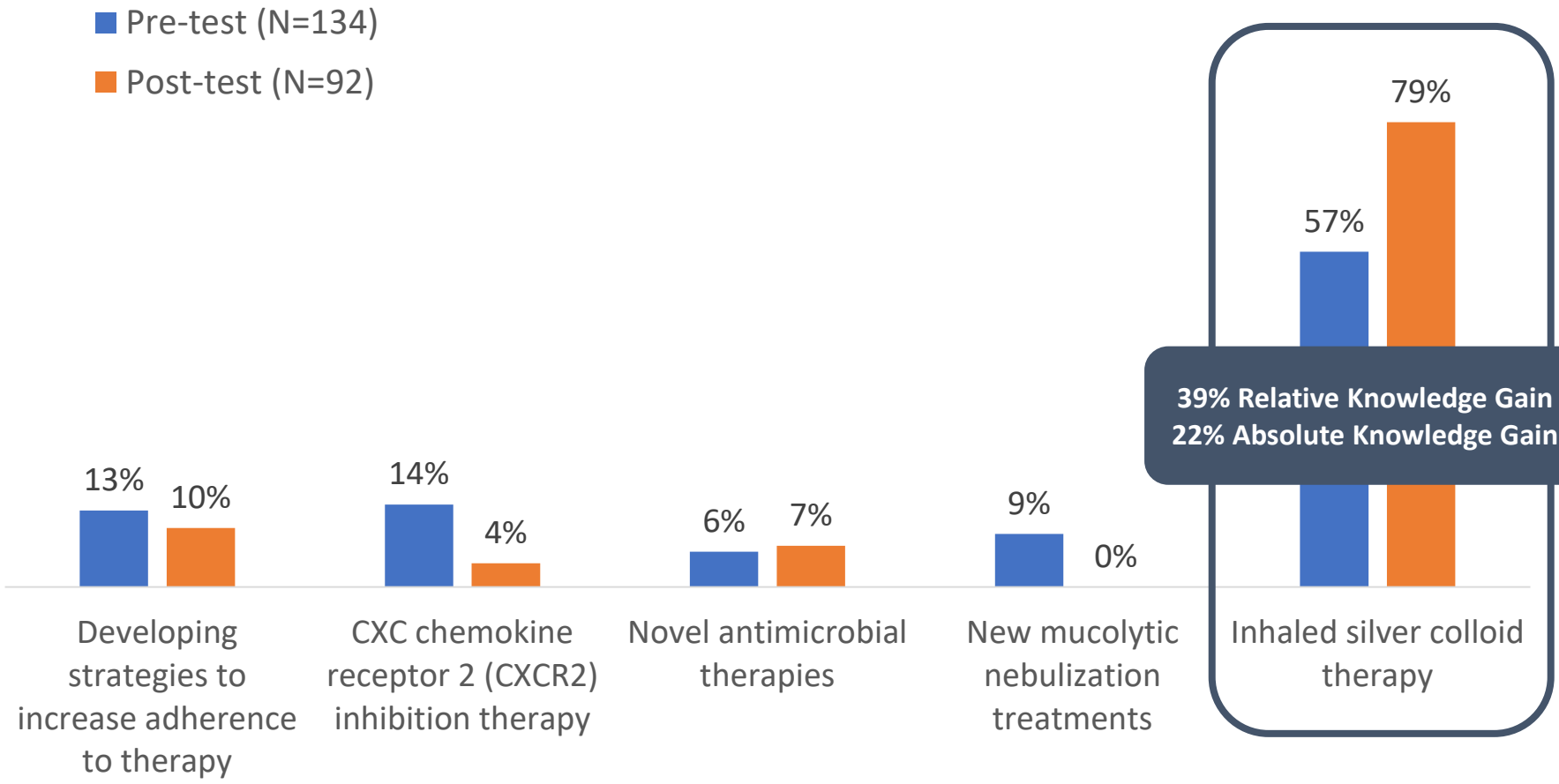
Level (3 & 4) Outcomes: Knowledge & Competence

Final Outcomes Summary – Live Symposium

National Jewish Health

Learning Objective: *Identify current and emerging treatments for patients with bronchiectasis*

Question 4: Idiopathic bronchiectasis is being more recognized as a significant pulmonary disorder that leads to morbidity. As patients of varying degrees of severity are identified, new therapies are being studied. The following are all being studied except for:



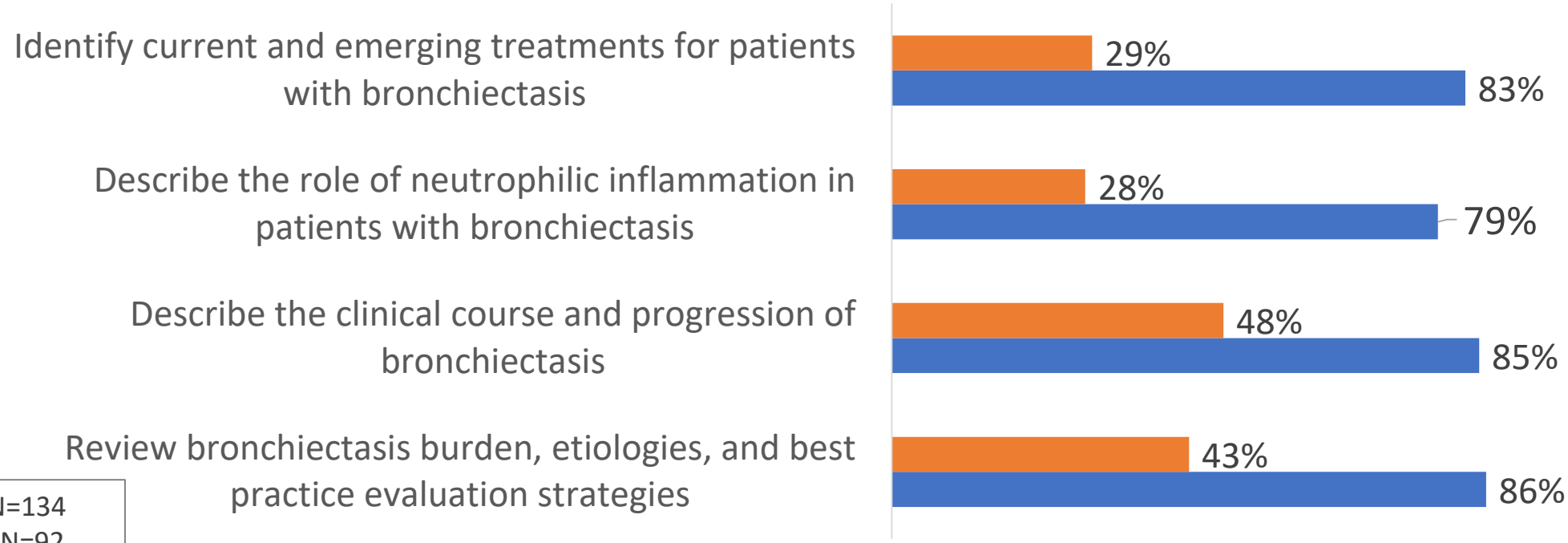
Clinical Rationale: The correct answer is (answer E) as there has been some literature to show concerns about potential health hazards from silver nanomaterials (Int J Mol Sci. 2014 Dec; 15(12): 23936–23974).

Level (4) Outcomes: Competence

Final Outcomes Summary – Live Symposium

National Jewish Health

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



Pre N=134
Post N=92

Level (4) Outcomes: Competence

Final Outcomes Summary – Live Symposium

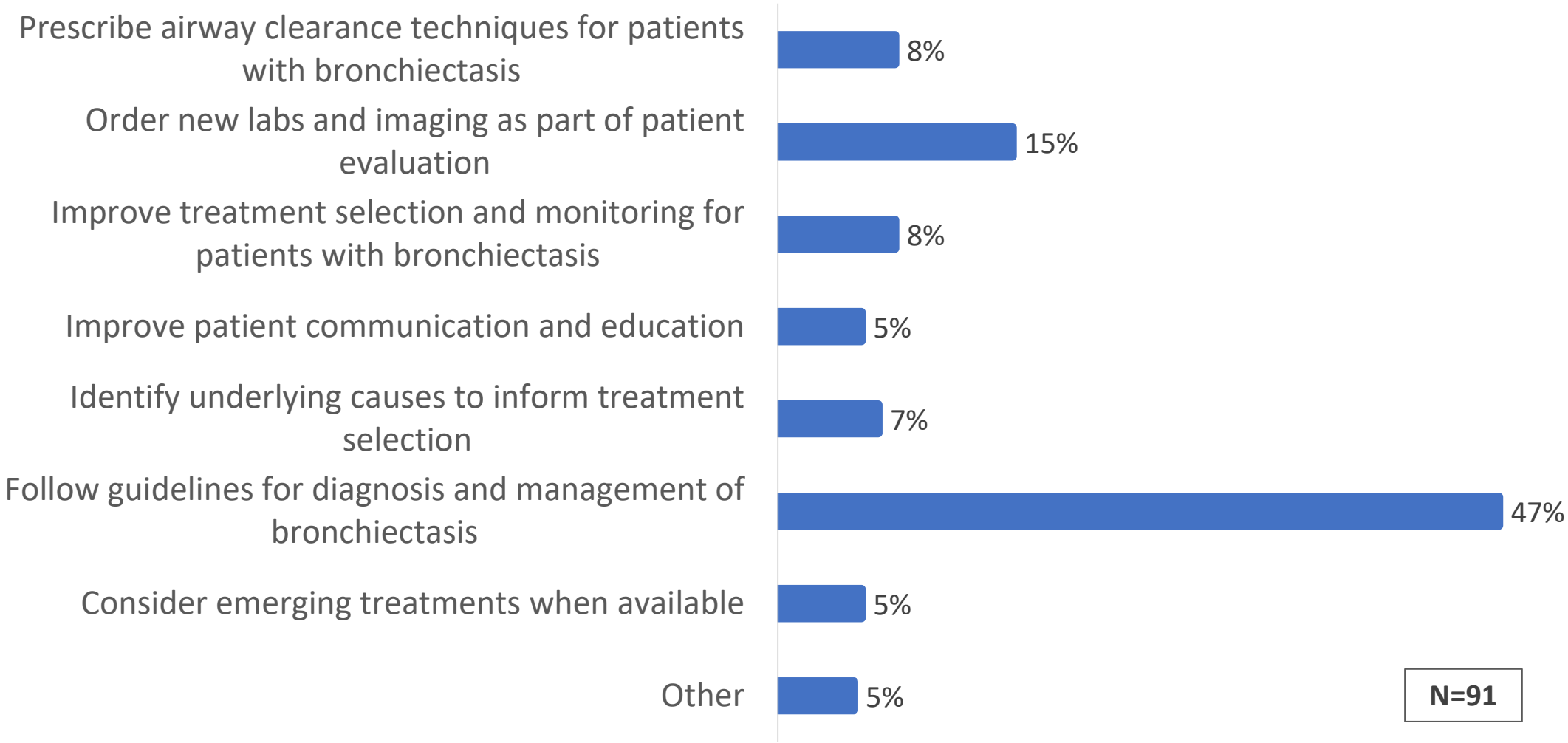
National Jewish Health

98%

N=92

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

Top changes evaluation respondents intend to make in practice after participating in this activity:



Evaluation Survey Results

Final Outcomes Summary – Live Symposium

National Jewish Health

Key Takeaways

- Aggressive eradication of pseudomonas
- Airway clearance
- Bronchiectasis management
- Culture and get rid of sputum
- Value of sputum pseudomonas culture positivity
- Differential work-up
- Etiology
- Guidelines
- Immune testing and early treatment for PA
- Increasing awareness of the amount of undiagnosed/incorrectly diagnosed of bronchiectasis
- Need for eradication after 1-2 bouts of pseudomonas-related bronchiectasis exacerbation
- Stepwise approach to non-CF bronchiectasis management
- Treatment of cx (-) bronchiectasis
- Start macrolide for more than 3 annual exacerbations
- Treatment of exacerbation

Future Topics

- Alpha 1 antitrypsin deficiency
- Diagnosis
- How the frequency and progression can be controlled
- Inhaled antibiotics
- Newer therapies
- Surgical management
- Work-up and indications for treatment when radiographs show disease without sputum growth
- MAC
- NTM related bronchiectasis
- When to treat NTM
- Problem-based cases will be helpful

Evaluation Survey Results

Final Outcomes Summary – Live Symposium

National Jewish Health

What barriers will the education provided help to address?

- Airway clearance
- Importance of airway clearance therapy compliance
- Patient compliance
- Access to care
- Cost of treatment
- Emphasis of therapy
- Expert opinion on antibiotic regimens
- Identifying more patients
- Lack of time
- More cultures
- To arrange for devices to address sputum clearance which are not available in my region
- What to order
- Work-up

70%

N=89

Evaluation respondents indicated the activity addressed strategies for overcoming barriers to optimal patient care

National Jewish Health

Accreditation Details

Final Outcomes Summary – Online Outcomes and Live Symposium

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.

National Jewish Health designates this live activity for a maximum of 1.0 *AMA PRA Category 1 Credit*™.

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