Can You Identify Patients with NTM?

Diagnosis, Treatment Selection, and Monitoring of Nontuberculous Mycobacterial Lung Disease

Insmed
Grant ID: NGC41154
Final Live and Online Outcomes Summary
Date Range 4/27/21-5/13/22

National Jewish Health®
Breathing Science is Life.®

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Executive Summary

Final Outcomes Summary

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Program Overview

Summary: This program was a blended series of 2 national live webinars and 4 Grand Round presentations at institutions across the country. The activity was also endured on myCME. The multimedia activity featured animated video clips on the processes involved in NTM, case-based review of HRCT imaging by a radiologist, and Q&A with expert faculty in pulmonology and infectious disease.

Learning Objectives

- Apply best practices to the diagnosis of NTM-LD.
- Implement treatment based on the updated NTM guidelines and individual patient response and considerations.
- Incorporate data on current and emerging therapies into treatment strategies for NTM-LD.

Target Audience & Accreditation

Target Audience: Pulmonologists and Infectious Disease Physicians, Primary Care/Family Medicine Physicians, Advanced Practice Nurses and Physician Assistants who treat patients with NTM.

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

Live activities: April – November, 2021
Enduring Activity: May 13, 2021 - May 13, 2022
Enduring Activity Link: https://www.mycme.com/courses/can-you-identify-patients-with-ntm-diagnosis-treatment-monitoring-7698

Program Features

Final Outcomes Summary

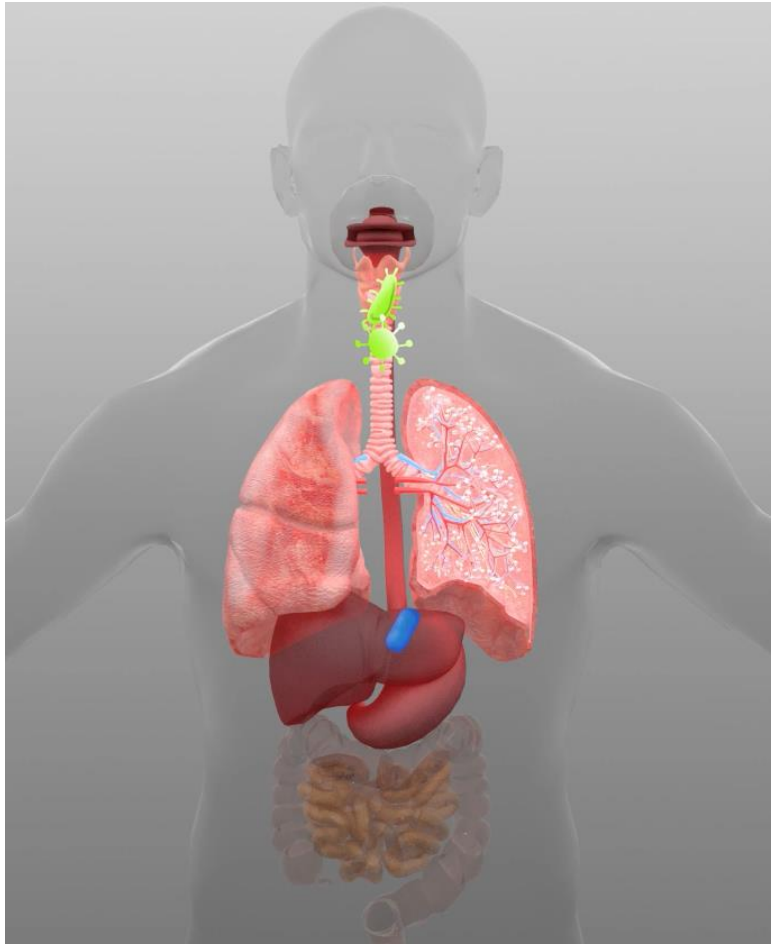
National Jewish Health

HRCT Imaging

Nodular Bronchiectatic Type

Features included:

- ✓Whiteboard animation clips
- ✓Interpretation of HRCT Imaging
- ✓Cases
- ✓Q&A discussions



NTM whiteboard animations

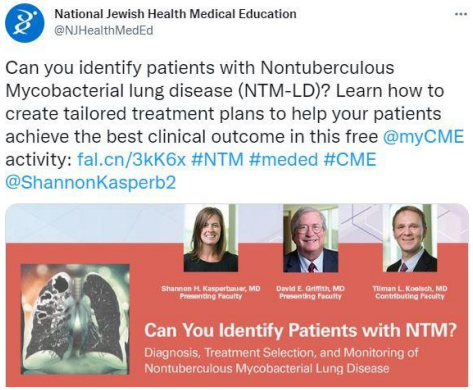
Audience Generation

Final Outcomes Summary

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: myCME, CHEST physicians & NJH database

Social media ads and posts

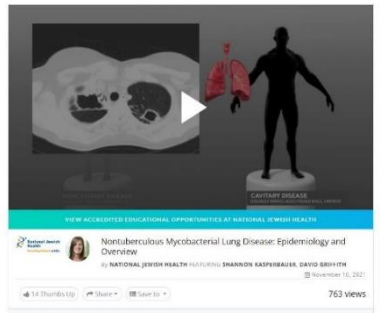


Search engine optimization on myCME Platform

Personalized + Customized Intelligent Marketing Platform

Dedicated landing page on NJH website and myCME platform

Distribution Platform partners

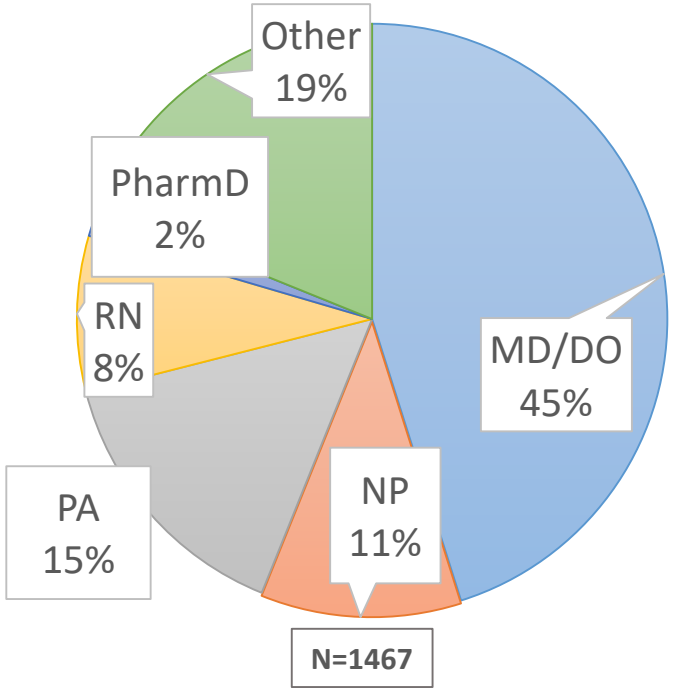


Promoted on VuMedi

Overall Program Impact

Final Outcomes Summary – Live Broadcasts and Online Enduring

National Jewish Health



Pie chart does not include unidentified online learners

2,733 total learners
across entire program
221 learners from live broadcasts
2,512 learners from online enduring

Exceeded total guaranteed learners by 553!

MD/DO=662
NP=161
PA=219
RN=125
PharmD=23
Other=277
Unidentified*=1266
Total learners = 2,733

*Unidentified learners are clinicians who view at least two pages of the enduring activity on myCME but do not proceed further for the platform to collect their demographic information.

Potential Impact to 88,192 patients visits this year

"Just about the best CME lecture I have heard- nicely summarized the initial part of the talk and applied that info to case presentations."
- Online enduring learner

Activity Format: Online Enduring

Final Outcomes Summary

National Jewish Health

myCME

PROFESSIONS SPECIALTIES FEATURED PREMIUM CONTENT LIVE EVENTS CATALOG Create A Free Account Cart (0)

Can You Identify Patients with NTM? Diagnosis, Treatment & Monitoring

CME 1.00 Credit

Webcast

Time to Complete: 60 minutes

Released: May 13, 2021

Expires: May 13, 2022

Maximum Credits:
1.00 / *AMA PRA Category 1 Credit™*

Start Activity

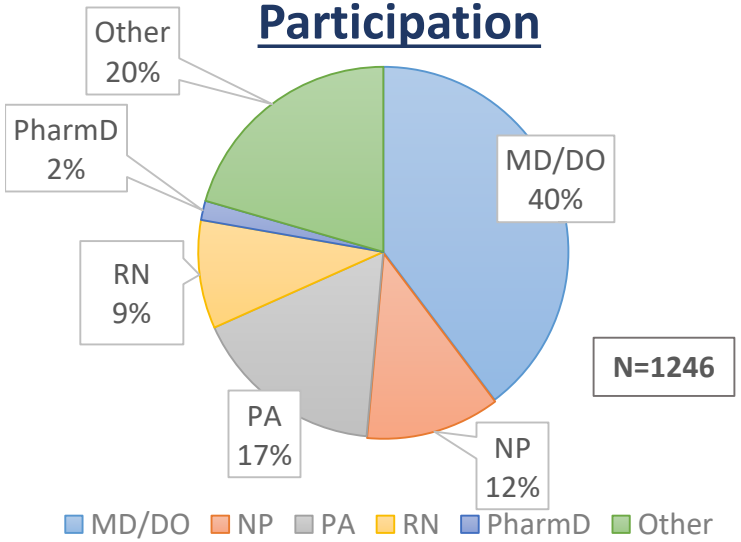
https://www.mycme.com/courses/can-you-identify-patients-with-ntm-diagnosis-treatment-monitoring-7698

Quantitative Educational Impact Summary

Final Outcomes Summary: Online Enduring Activity

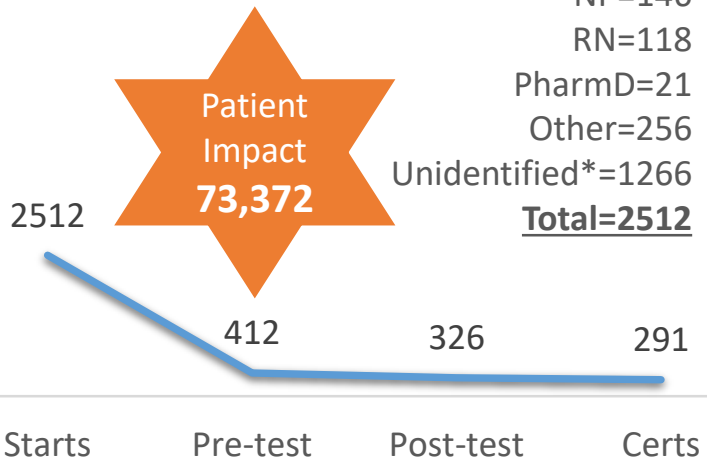
National Jewish Health

Participation

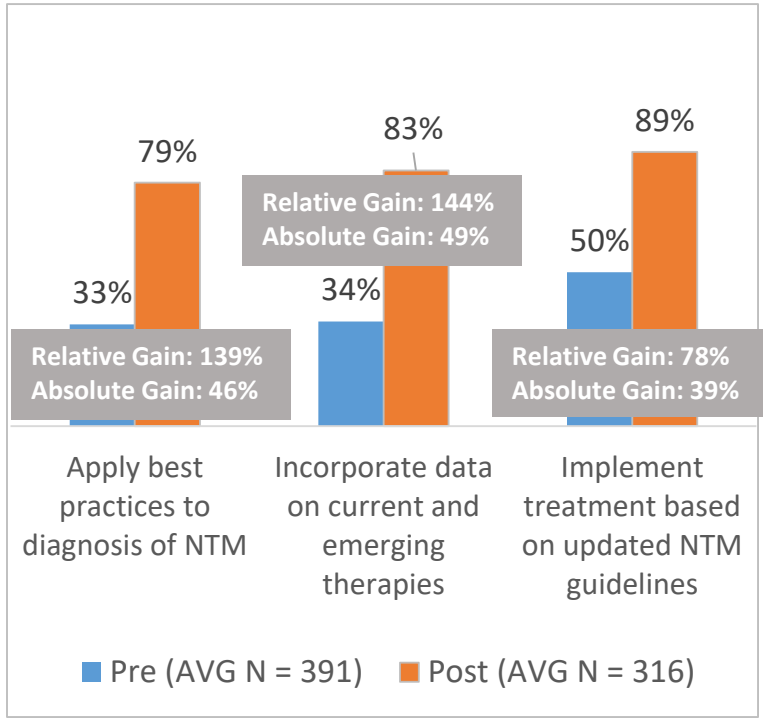


Pie chart does not include unidentified online learners

MD/DO=495
PA=210
NP=146
RN=118
PharmD=21
Other=256
Unidentified*=1266
Total=2512

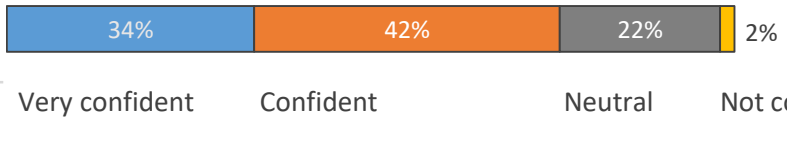


Learning Gain Across Objectives



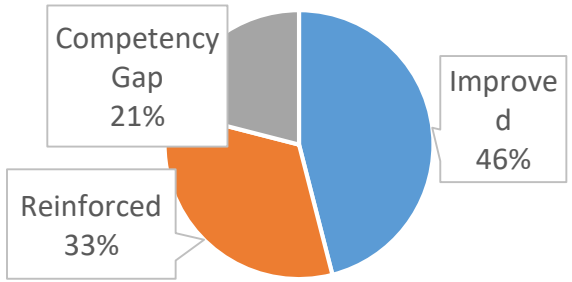
105% Relative Gain in Confidence Across LOs

Confidence @ Post-Test

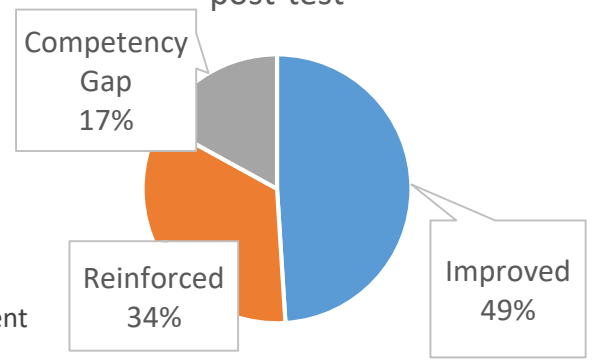


Persistent Learning Gaps/Needs

21% of learners were unable to apply best practices to the diagnosis of NTM at post-test



17% of learners were unable to implement treatment based on the updated NTM guidelines at post-test



Qualitative Educational Impact Summary

Final Outcomes Summary: Online Enduring Activity

National Jewish Health

Patient Impact

310
Evaluation respondents

Who see
1,411
NTM Patients Weekly

Which translates to
73,372
Patient Visits Annually

Educational Impact

Knowledge and Competence Change by Learning Objective

✓ Applying best practices to the diagnosis of NTM-LD increased by **139%** [N=297]

✓ **144%** increase shown by learners in incorporating data on current and emerging therapies into treatment strategies for NTM-LD [N=326]

✓ Implementing treatments based on the updated NTM guidelines and individual patient response and considerations increased by **78%** [N=326]

Practice Change

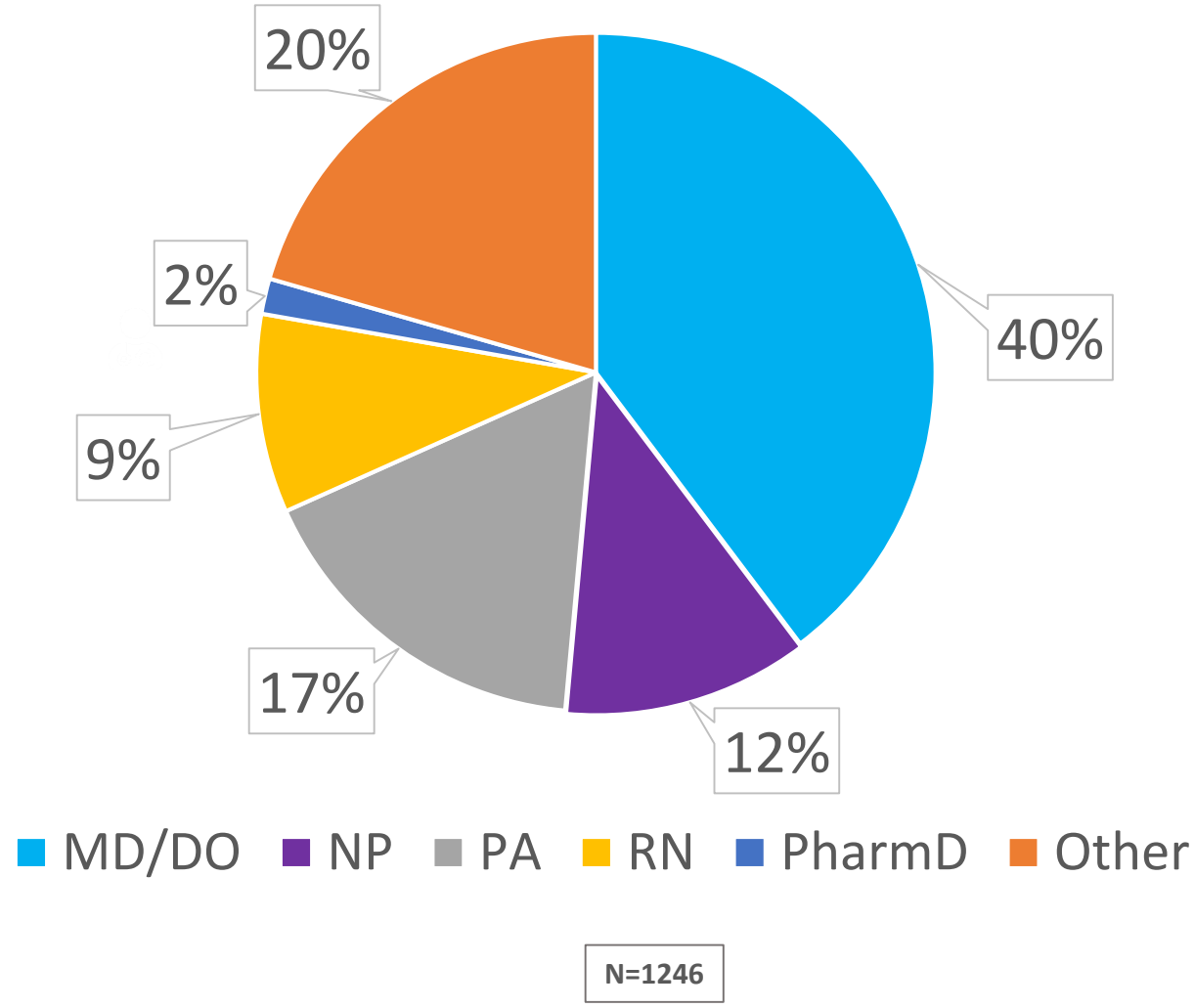
91%
Reported intent to change their practice [N=310]

105% Overall relative confidence gain [N=310]

75%
Indicated the activity addressed strategies for overcoming barriers to optimal patient care [N=310]

Level (1) Outcomes: Participation (Degree)

Final Outcomes Summary: Online Enduring Activity



N=1246

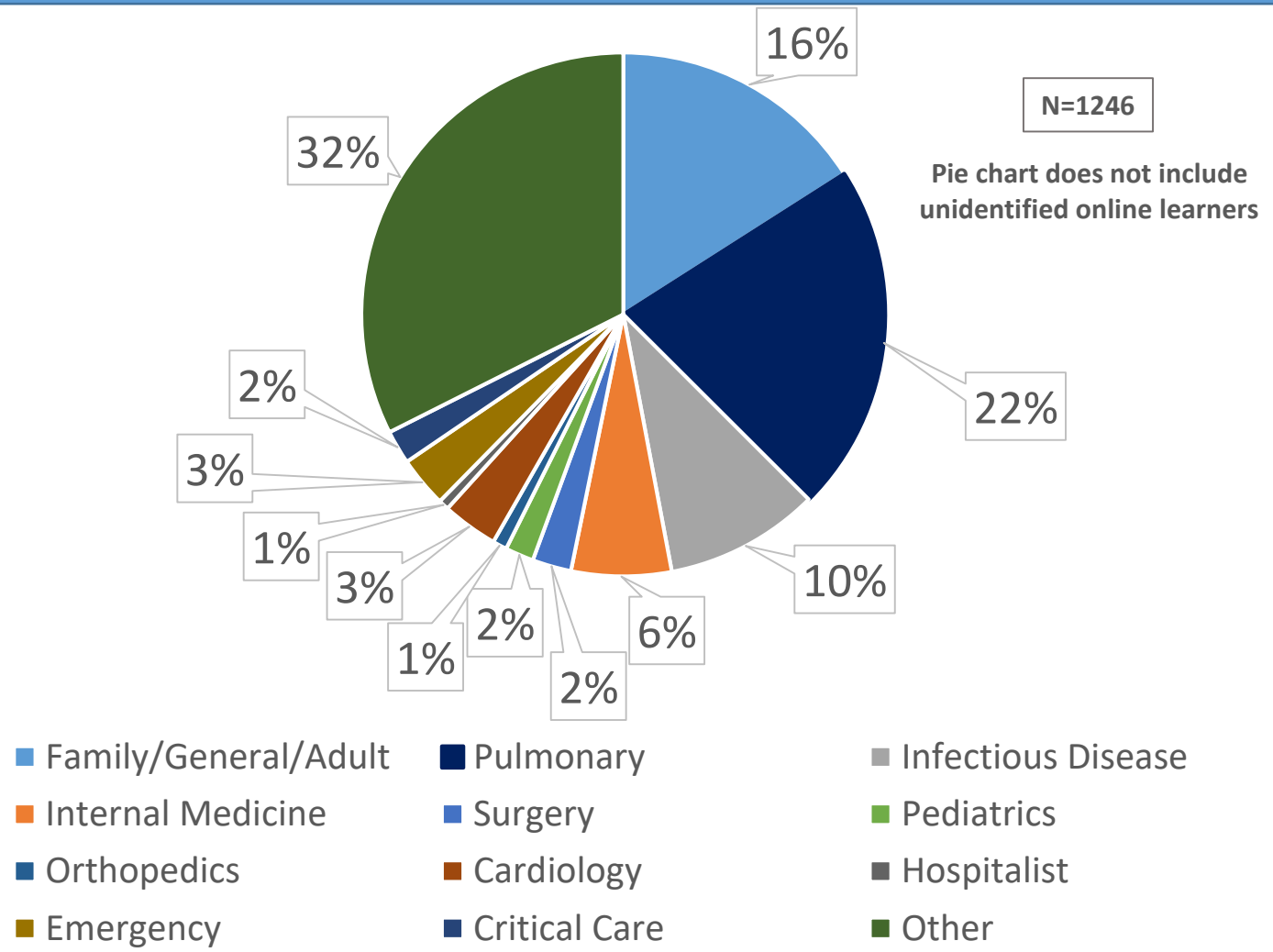
Pie chart does not include unidentified online learners

Degree	Total
MD/DO	495
PA	210
NP	146
RN	118
PharmD	21
Other	256
Unidentified*	1266
TOTAL	**2512**

*Unidentified learners are clinicians who view at least two pages of the enduring activity on myCME but do not proceed further for the platform to collect their demographic information.

Level (1) Outcomes: Participation (Specialty)

Final Outcomes Summary: Online Enduring Activity



*Unidentified learners are clinicians who view at least two pages of the enduring activity on myCME but do not proceed further for the platform to collect their demographic information.

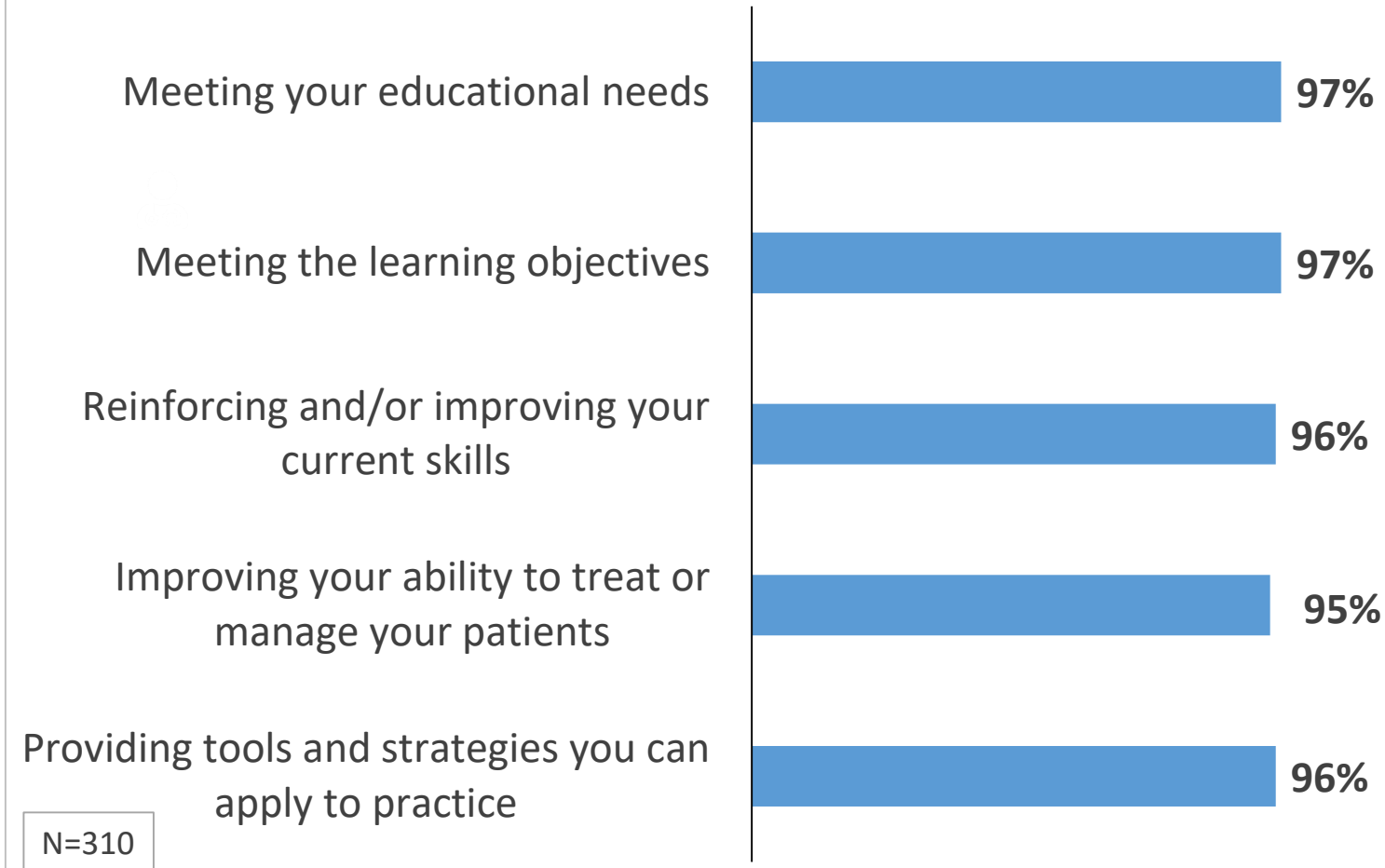
Degree	Total
Pulmonary	268
Family/General/Adult	199
Infectious Disease	119
Internal Medicine	77
Surgery	30
Pediatrics	22
Orthopedics	11
Cardiology	43
Hospitalist	8
Emergency	39
Critical Care	26
Other (radiology, allergy, pathology, geriatric medicine, etc)	404
Unidentified*	1266
Total	**2512**

Level (2) Outcomes: Satisfaction

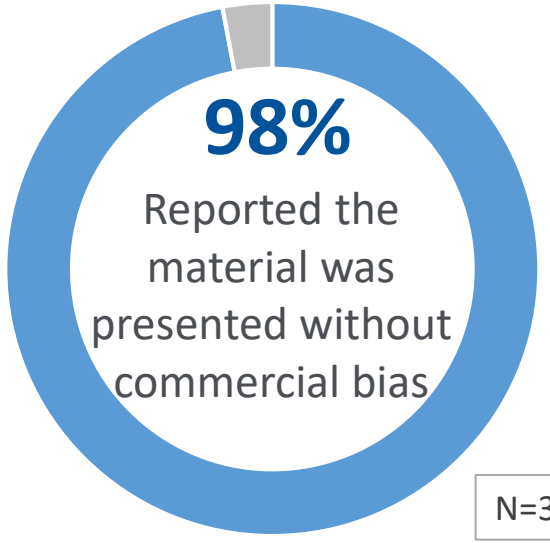
Final Outcomes Summary: Online Enduring Activity

National Jewish Health

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



N=310

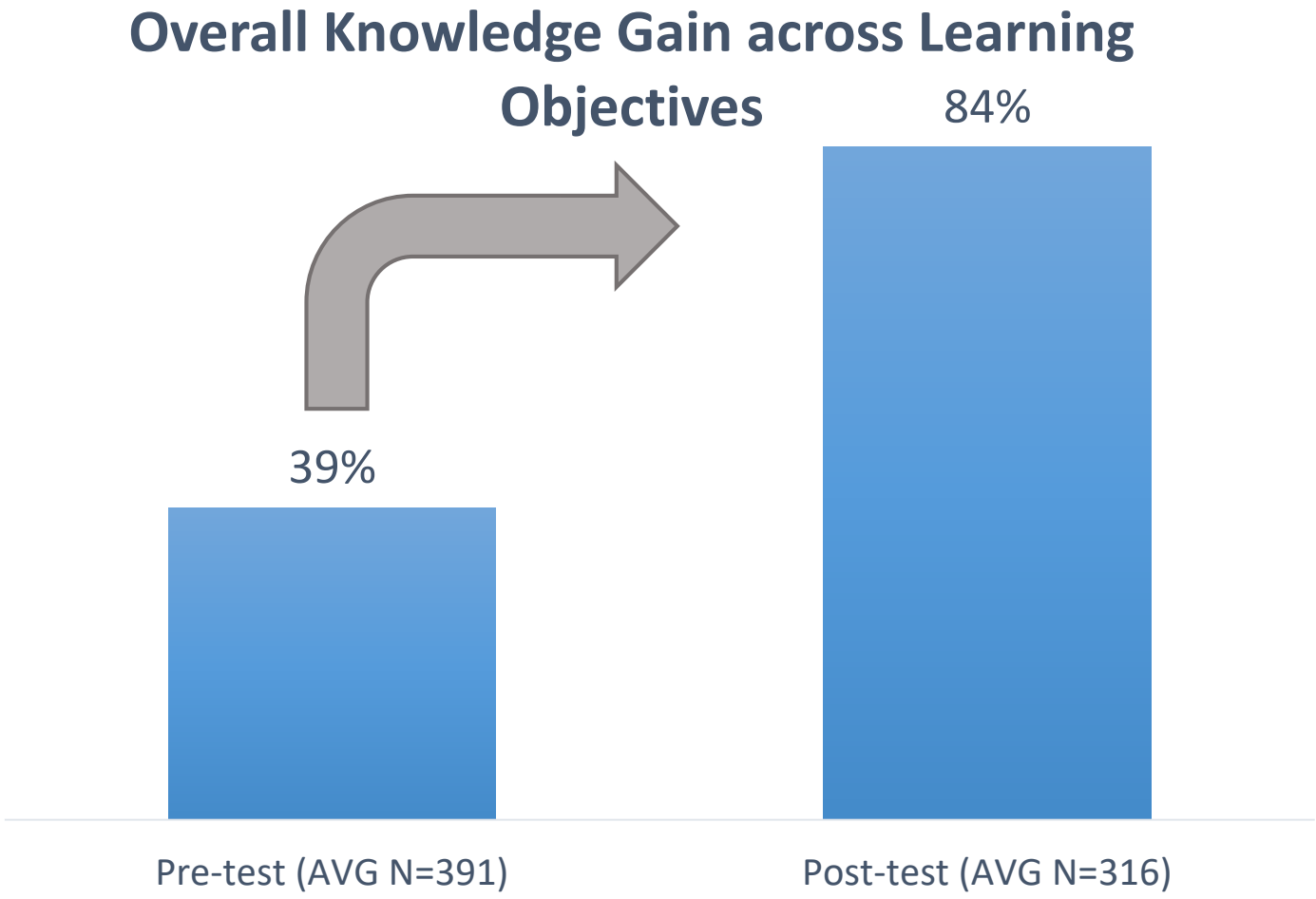


N=310

Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Online Enduring Activity



115% Overall Relative Knowledge Gain

45% Overall Absolute Knowledge Gain

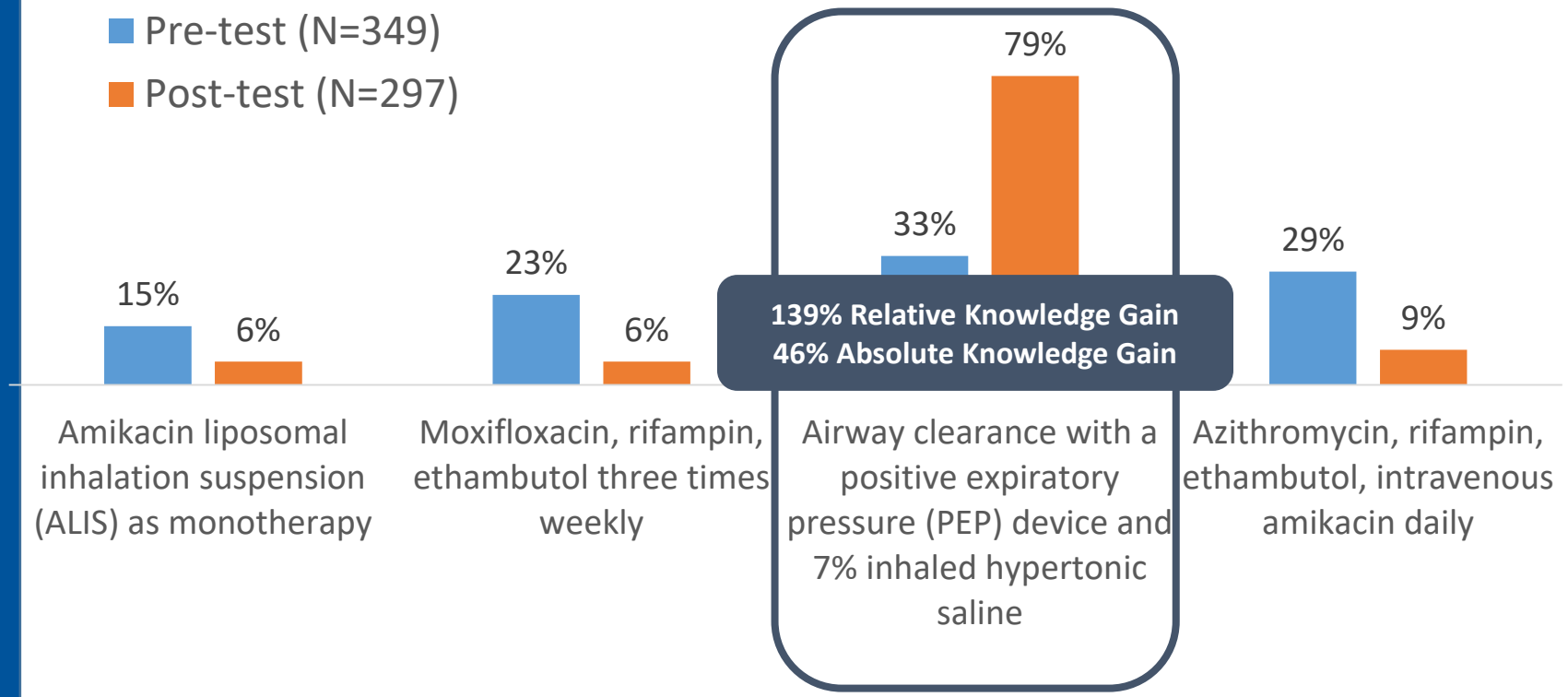
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Online Enduring Activity

Learning Objective: *Apply best practices to the diagnosis of NTM-LD*

Question 1: A 67-year-old patient is referred to you with a long history of frequent bouts of bronchitis requiring antibiotic therapy. Between episodes of bronchitis she has persistent cough with mild sputum production and fatigue. Her sputum is culture positive for Mycobacterium avium which is recovered on 2 sputum specimens that are AFB smear negative and culture positive on broth medium only. Her chest CT scan shows mild bilateral bronchiectasis with scattered tree-in-bud opacities. The initial management of this patient should include:



Clinical Rationale: The patient should begin airway clearance efforts with close follow-up including symptom assessment, sputum AFB analysis and chest imaging. Persistence of symptoms, persistent positive sputum cultures for MAC and radiographic progression are all individually and collectively indications to begin guidelines based MAC therapy, in this case, airway clearance with a positive expiratory pressure (PEP) device and 7% inhaled hypertonic saline.

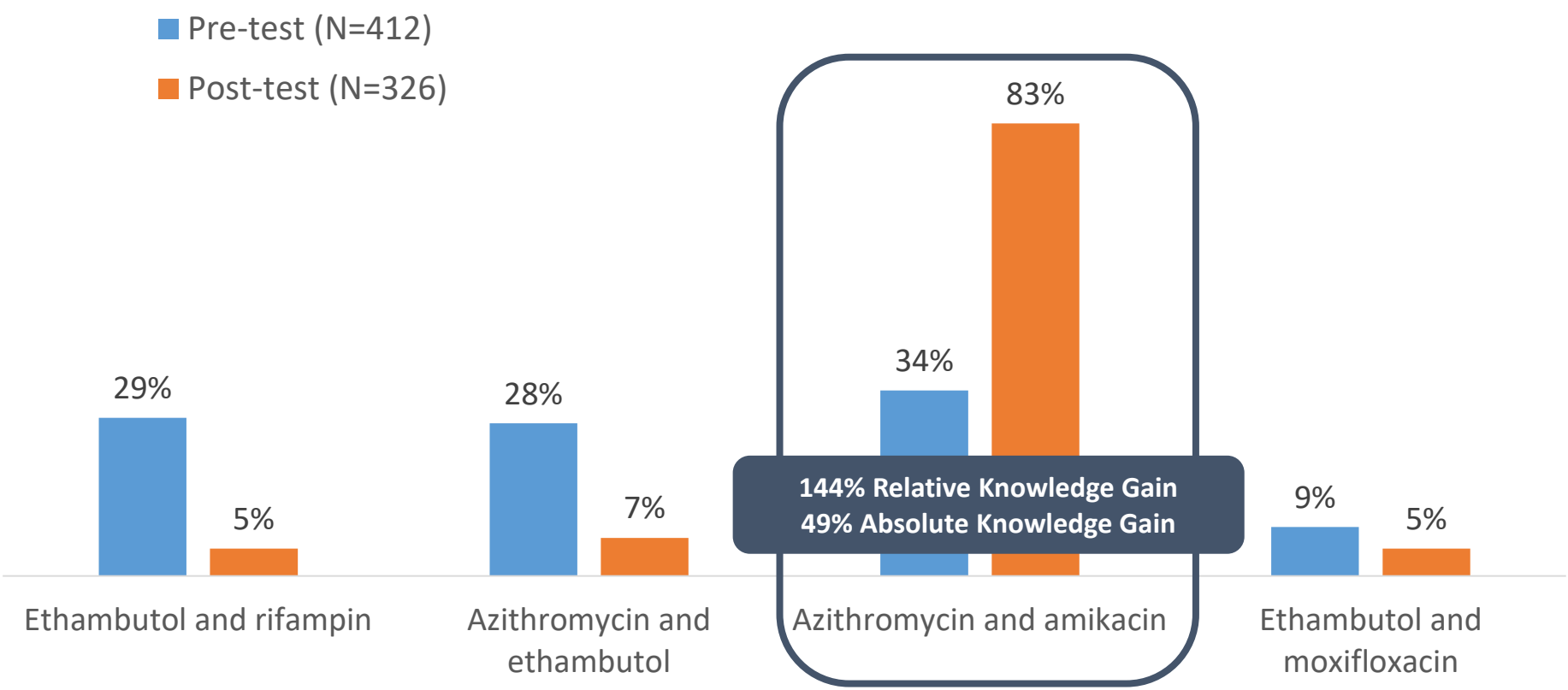
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Online Enduring Activity

Learning Objective: *Incorporate data on current and emerging therapies into treatment strategies for NTM-LD*

Question 2: In vitro susceptibility testing for MAC is recommended for which 2 antibiotics?



Clinical Rationale: In vitro susceptibility for MAC isolates has been shown to predict treatment response (success and failure) for macrolides (azithromycin) and amikacin. No other antibiotics used for treating MAC have been shown to have that correlation.

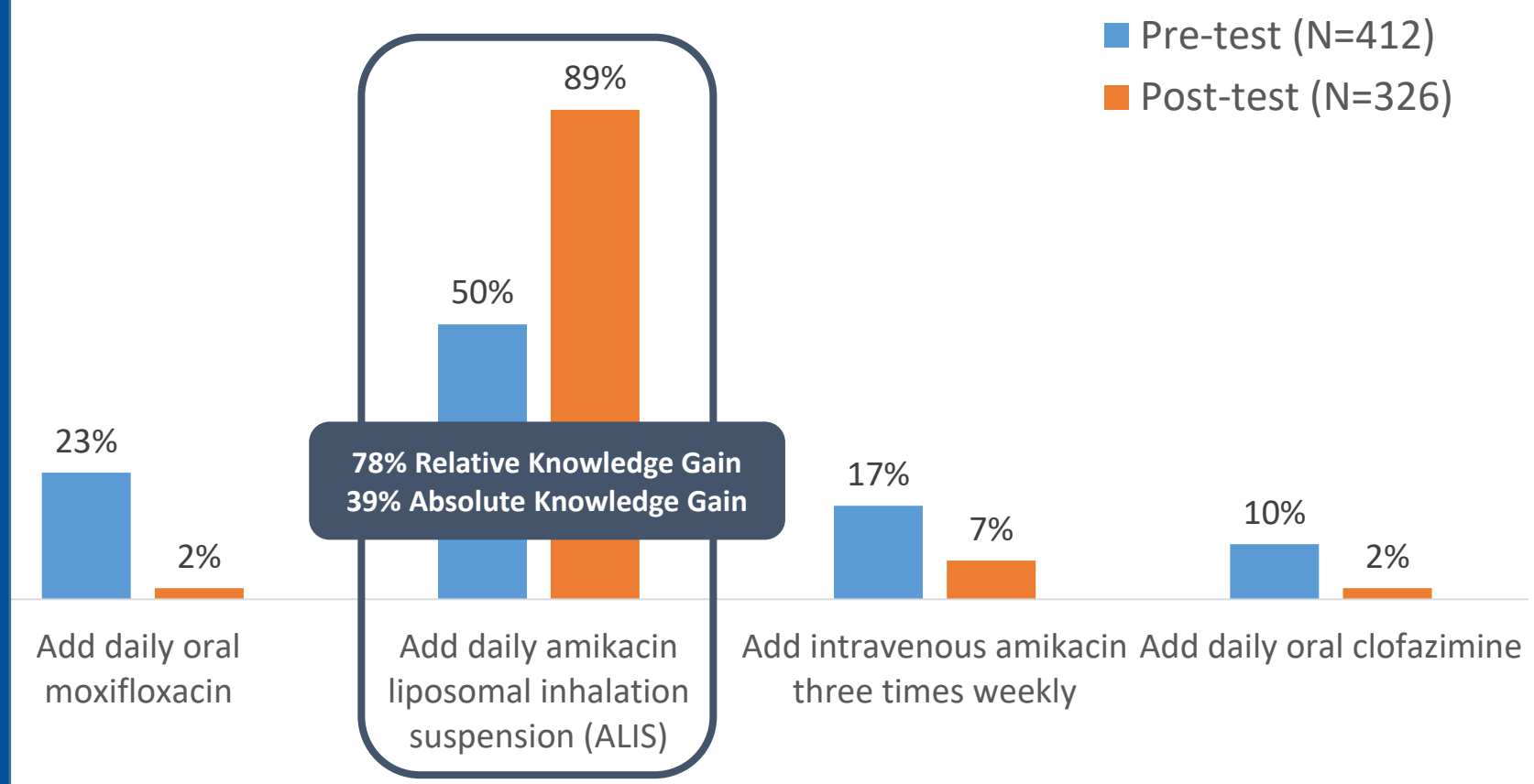
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Online Enduring Activity

Learning Objective: *Implement treatment based on the updated NTM guidelines and individual patient response and considerations*

Question 3: In patients with refractory MAC lung disease defined as persistently positive sputum cultures for MAC after at least 6 months of guidelines based therapy, what is the FDA approved recommendation for augmenting therapy according to the 2020 multi-society NTM treatment guidelines?

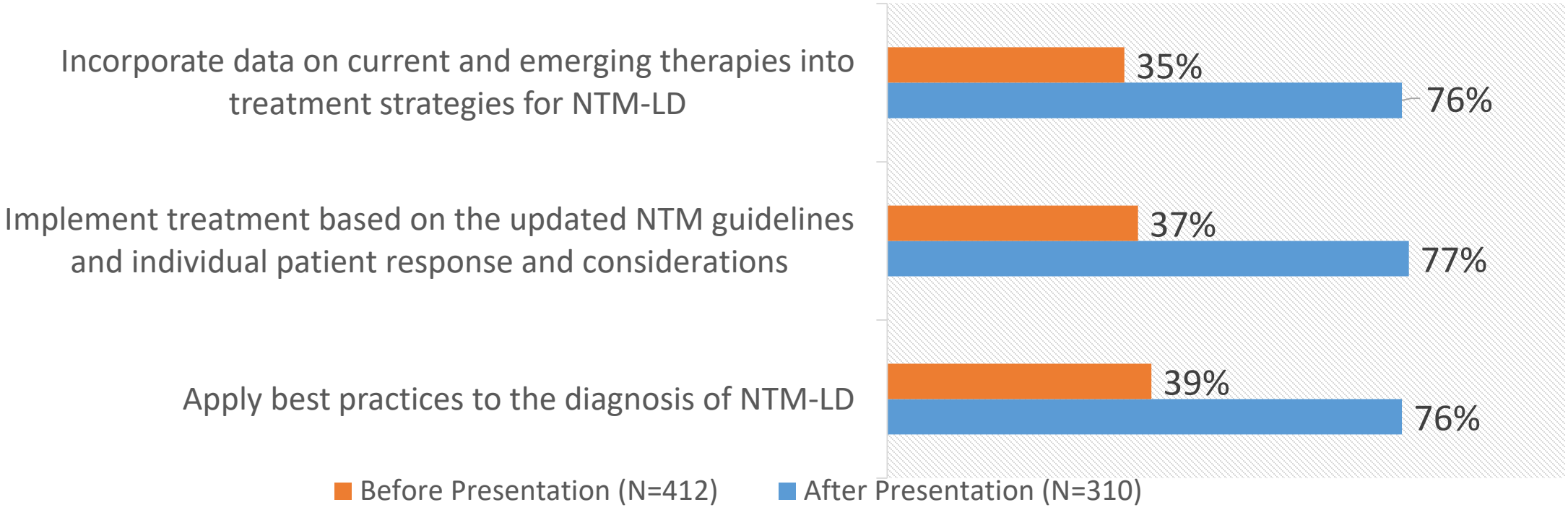


Clinical Rationale: The new NTM treatment guidelines strongly recommend adding ALIS to the treatment regimens of MAC patients who meet the definition of treatment refractory disease. This recommendation is consistent with the approval guidance from the FDA for ALIS.

Level (4) Outcomes: Competence

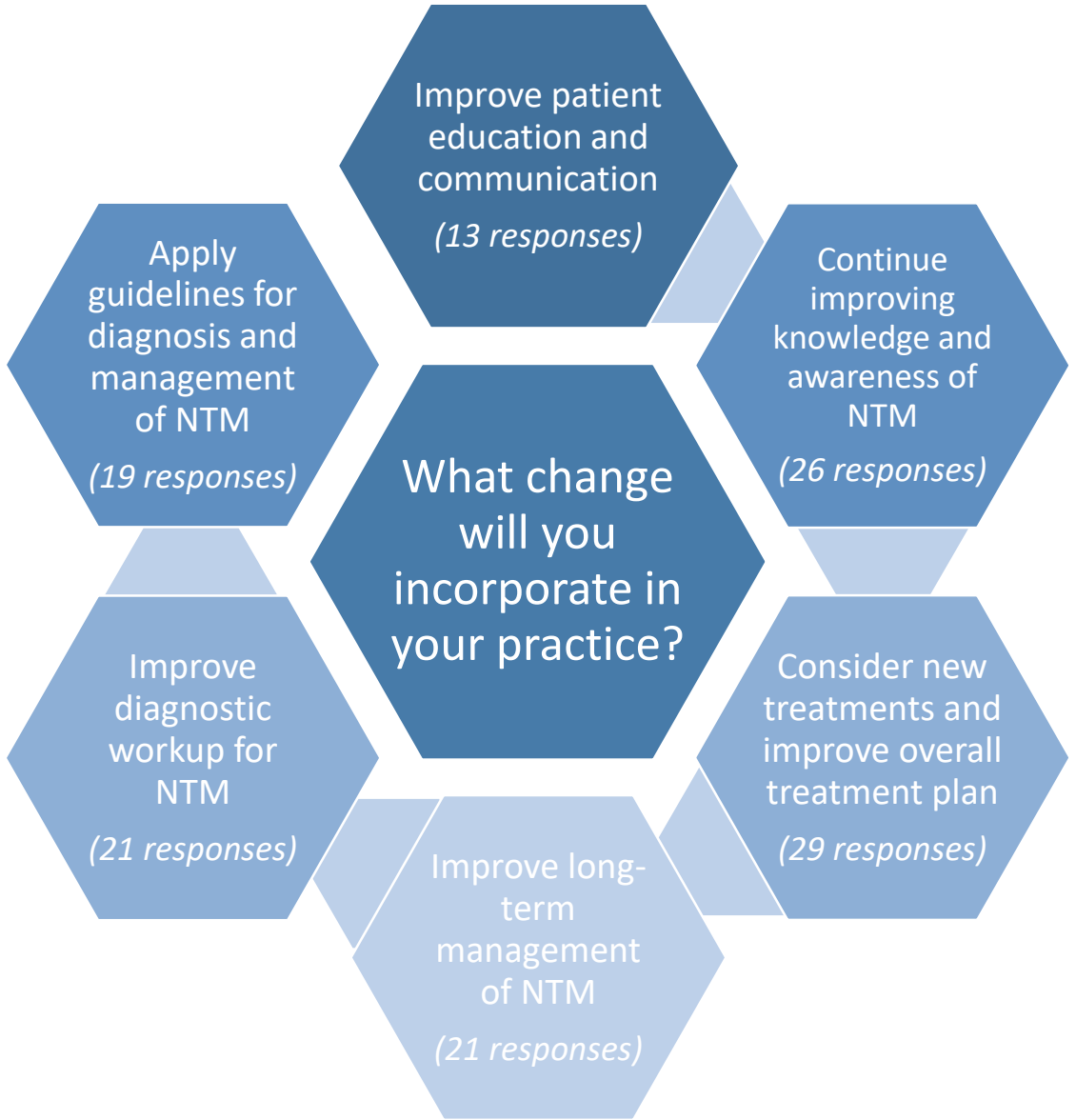
Final Outcomes Summary: Online Enduring Activity

Learners 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 Enduring Activity



N=129

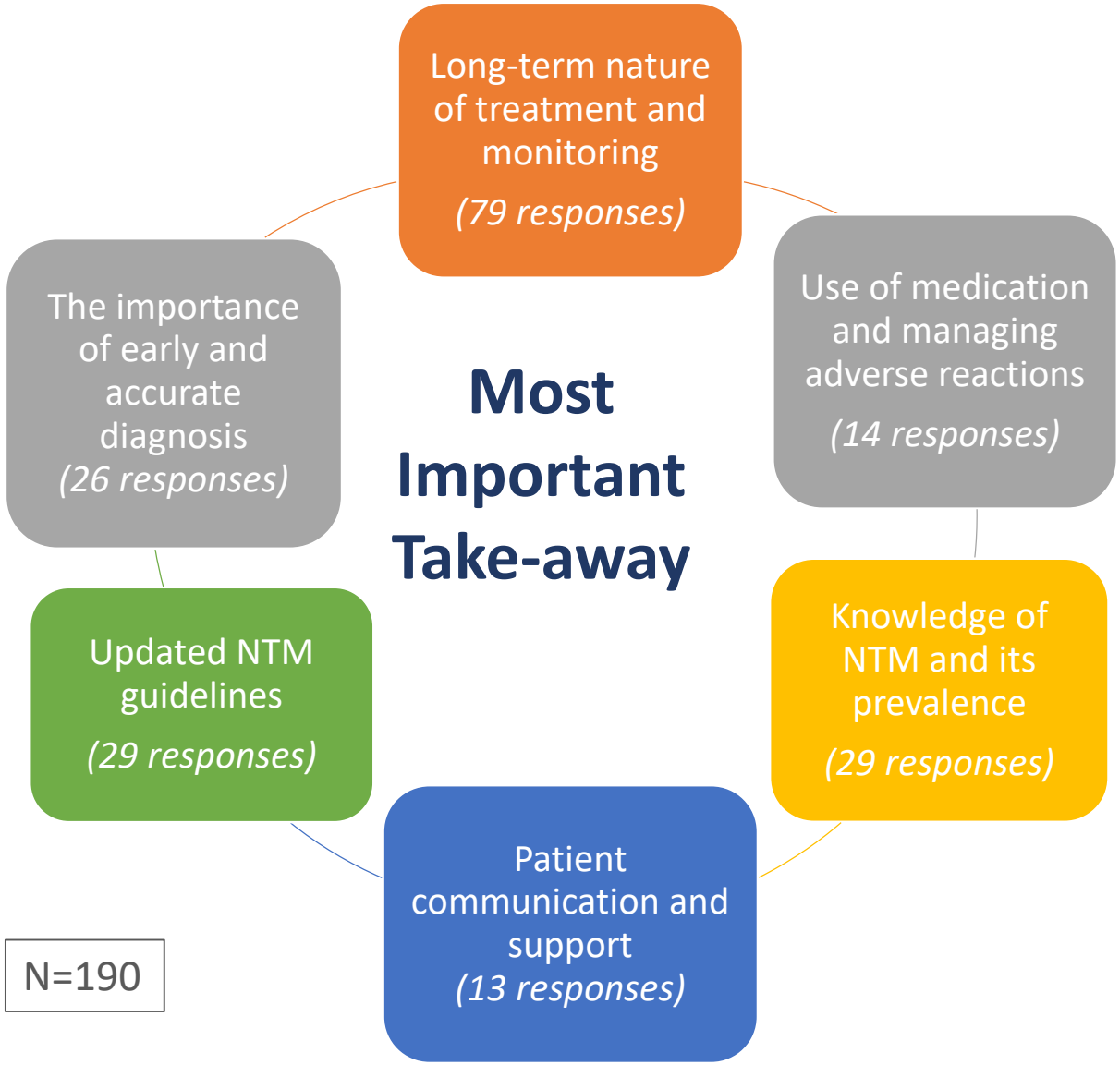
91%

N=310

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

Evaluation Survey Results

Final Outcomes Summary: Online Enduring Activity



"Enjoyed the course, it opened my eyes to lab side and sputum testing frequency."
- Online enduring learner

"The visuals were very helpful and the radiology review was excellent.."
- Online enduring learner

Evaluation Survey Results

Final Outcomes Summary: Online Enduring Activity

National Jewish Health

What barriers will the education provided help to address?

- Access to care
- Evidence-based practice
- Knowledge of disease process and treatment
- Knowledge of guidelines
- Knowledge of the radiological findings
- Discussing expectations and monitoring early on
- Patient compliance with treatment
- Patient education and treatment options
- Patient resistance to therapy
- Starting treatment before referral
- What medications to use and when to use them
- Cost and insurance issues

75%

N=310

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

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Evaluation Survey Results

Final Outcomes Summary: Online Enduring Activity

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What topics would you like more information about in future educational activities?
• Drug susceptibility testing of NTM isolates • Differential diagnosis of NTM • Indications for surgery • More complex management issues • How to use alternative agents • Nutrition for patients with NTM and supplements to enhance treatment • Prognosis • Radiological aspects in detail • Surgical procedures • Treatment and workup of NTM

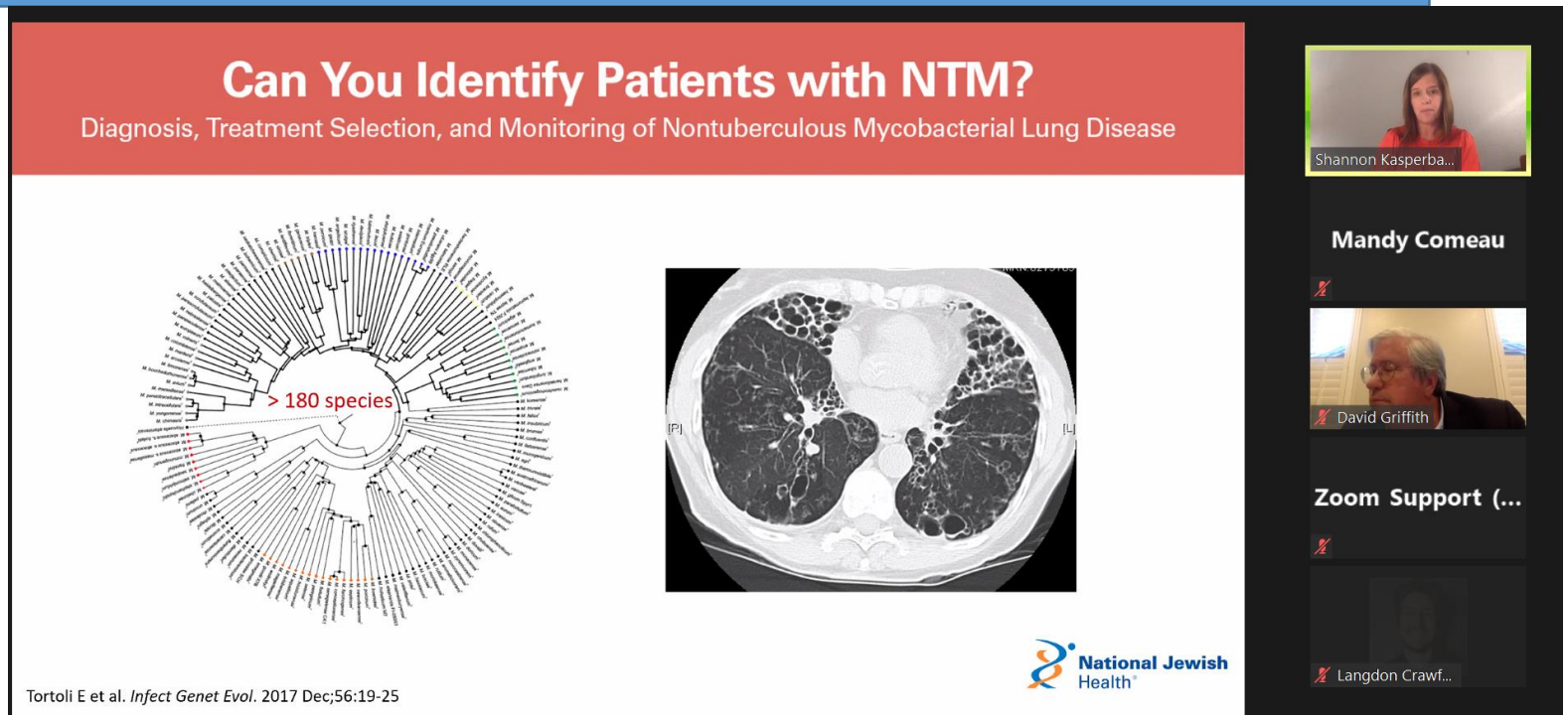
Activity Format: Live Broadcasts

Final Outcomes Summary: Live Webinars and Grand Rounds

National Jewish Health Hosted National Webinars

April 27, 2021

July 29, 2021



Tortoli E et al. *Infect Genet Evol*. 2017 Dec;56:19-25

Presentations at Grand Rounds - Locations and Dates

Jefferson Health in Philadelphia, PA	June 29, 2021
University of California in Los Angeles, CA	September 7, 2021
Mount Sinai in New York, NY	September 10, 2021
National Jewish Health in Denver, CO*	October 29, 2021
University of Florida, Jacksonville, FL	November 1, 2021

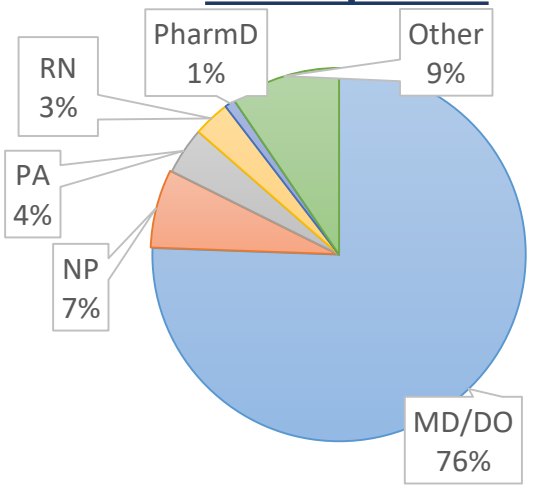
**NJH Grand Rounds offered as an additional session.*

Quantitative Educational Impact Summary

Final Outcomes Summary: Live Webinars and Grand Rounds

National Jewish Health

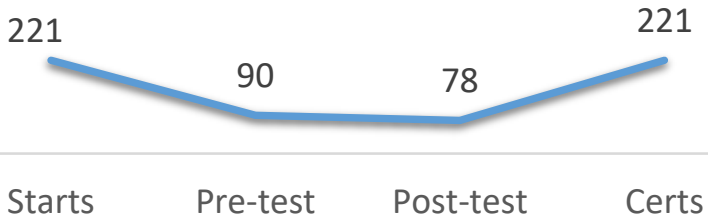
Participation



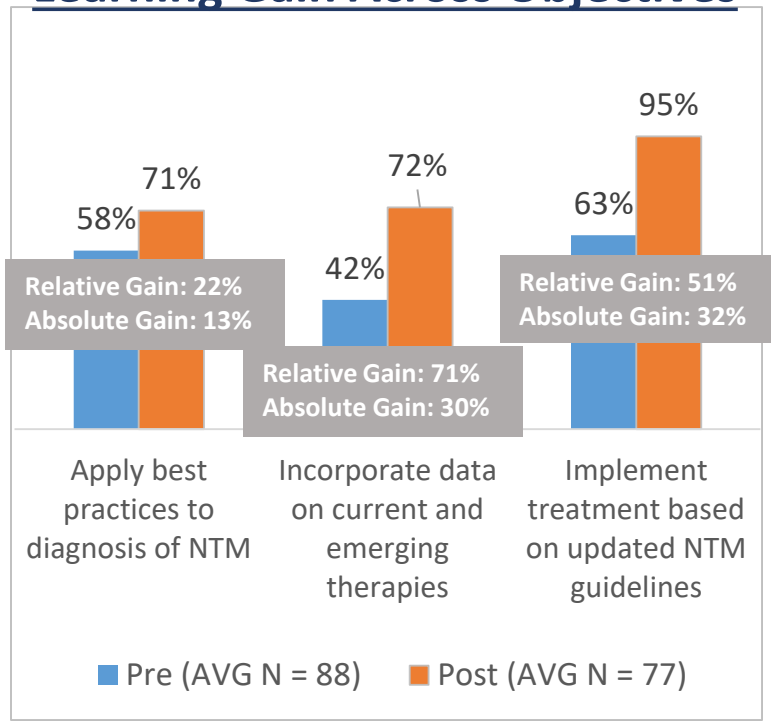
MD/DO NP PA RN PharmD Other

Patient Impact **14,820**

MD/DO=167
NP=15
PA=9
RN=7
PharmD=2
Other=21
Total=221

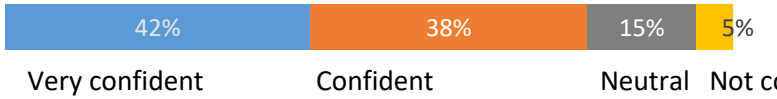


Learning Gain Across Objectives



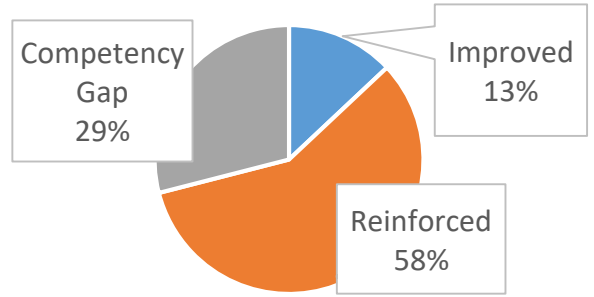
233% Relative Gain in Confidence Across LOs

Confidence @ Post-Test

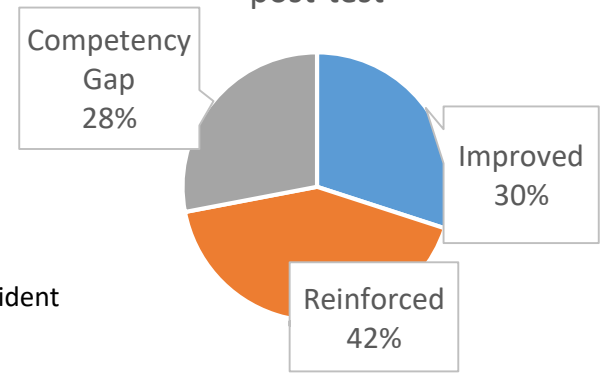


Persistent Learning Gaps/Needs

29% of learners were unable to apply best practices to the diagnosis of NTM at post-test



28% of learners were unable to implement treatment based on the updated NTM guidelines at post-test



Qualitative Educational Impact Summary

Final Outcomes Summary: Live Webinars and Grand Rounds

National Jewish Health

Patient Impact

78
Evaluation respondents

Who see
285
NTM Patients Weekly

Which translates to
14,820
Patient Visits Annually

Educational Impact

Knowledge and Competence Change by Learning Objective

✓ Applying best practices to the diagnosis of NTM-LD increased by **22%** [N=76]

✓ Incorporating data on current and emerging therapies into treatment strategies for NTM-LD increased by **71%** [N=78]

✓ Implementing treatments based on the updated NTM guidelines and individual patient response and considerations increased by **51%** [N=78]

Practice Change

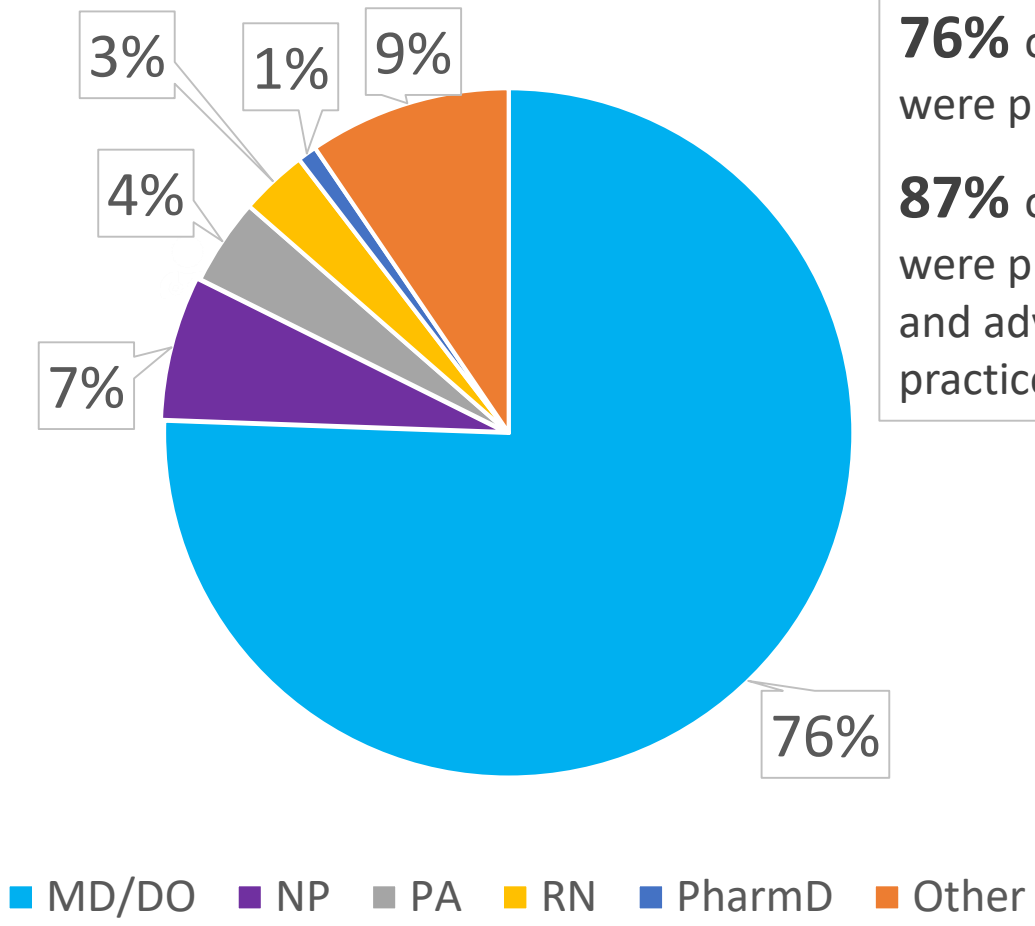
93%
Reported intent to change their practice [N=77]

233% Overall relative confidence gain [N=78]

71%
Indicated the activity addressed strategies for overcoming barriers to optimal patient care [N=77]

Level (1) Outcomes: Participation (Degree)

Final Outcomes Summary: Live Webinars and Grand Rounds



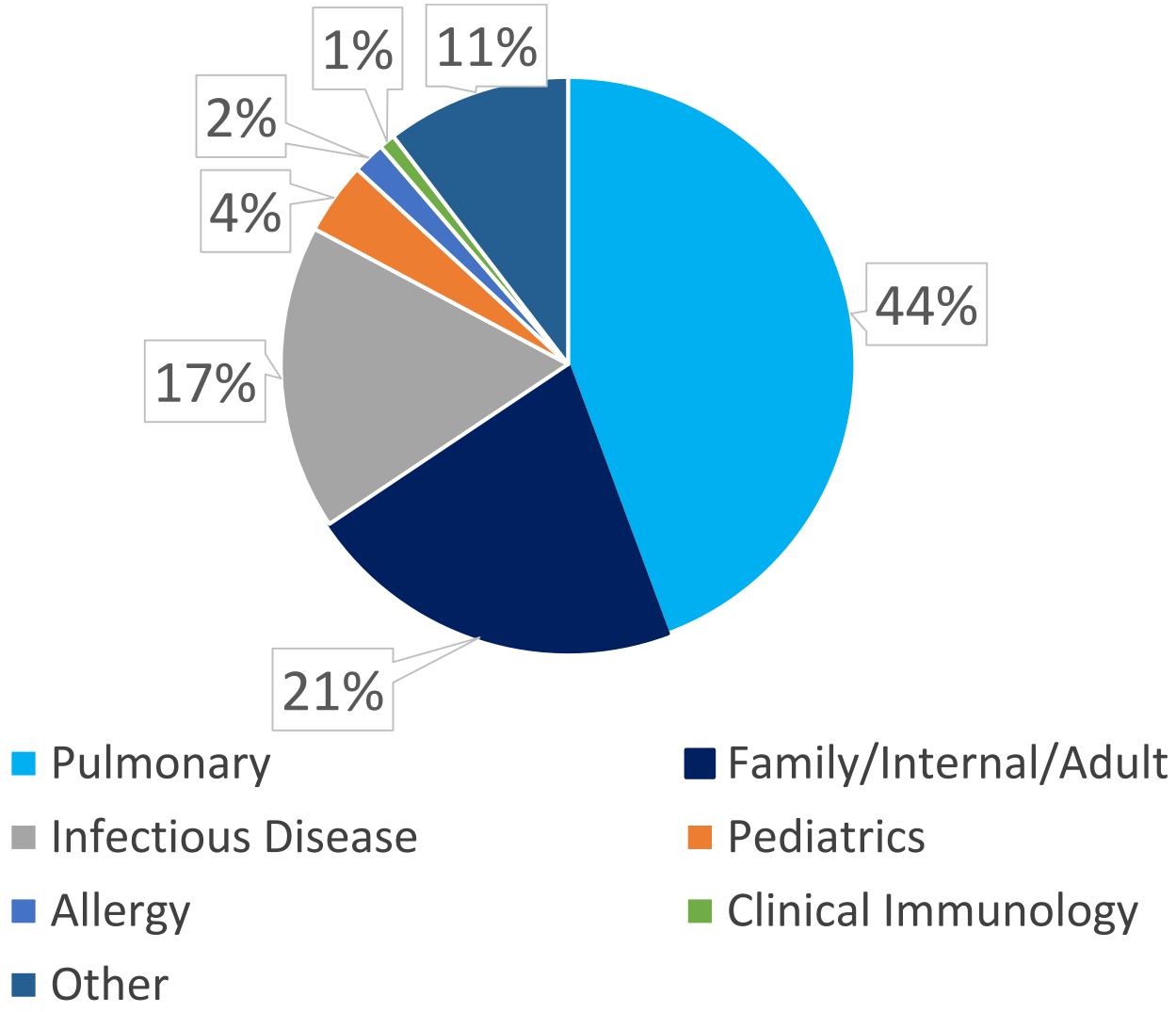
76% of learners were physicians

87% of learners were physicians and advanced practice providers

Degree	Total
MD/DO	167
NP	15
PA	9
RN	7
PharmD	2
Other	21
Total Learners	**221**

Level (1) Outcomes: Participation (Specialty)

Final Outcomes Summary: Live Webinars and Grand Rounds



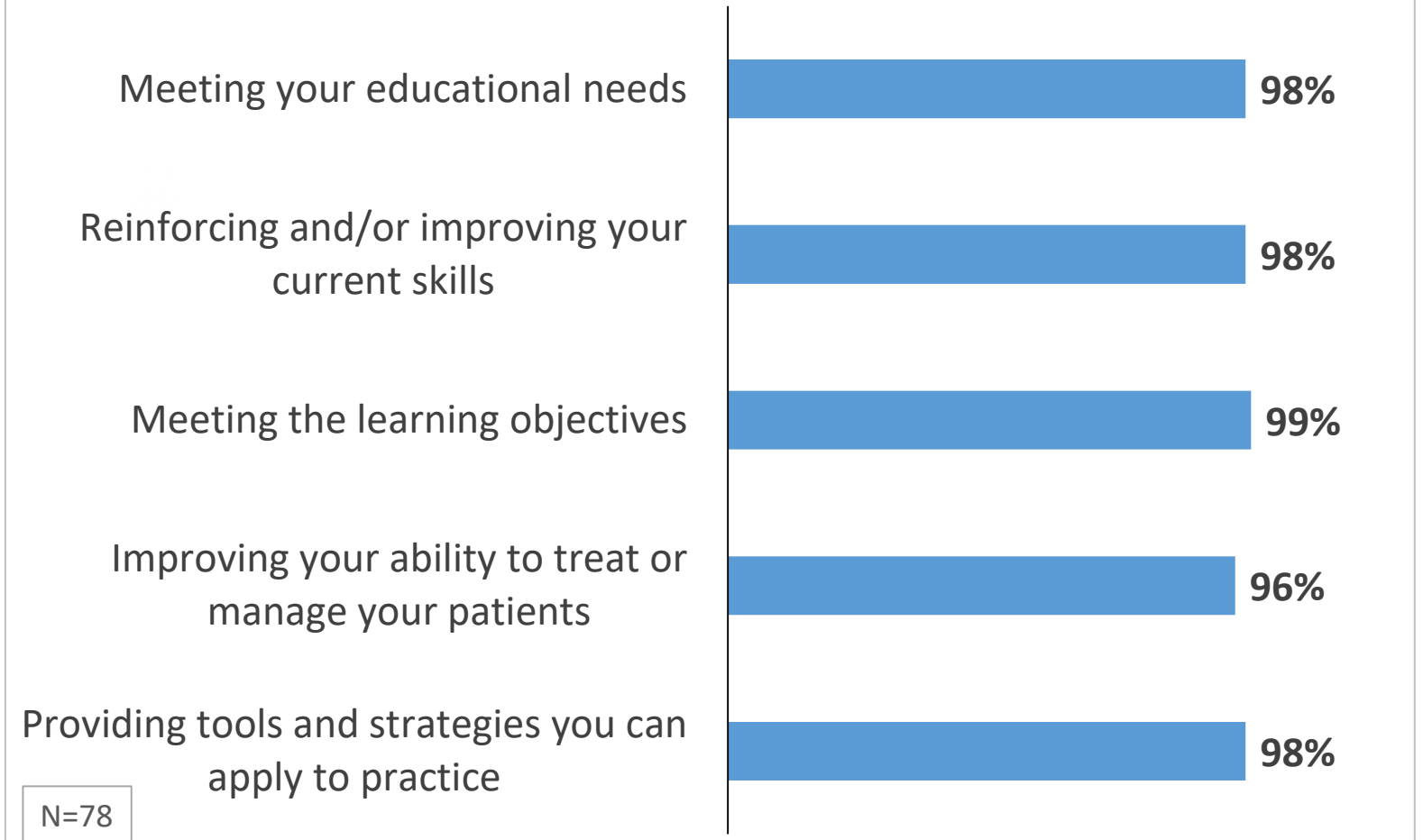
Degree	Total
Pulmonary	98
Family/Internal/Adult	47
Infectious Disease	38
Pediatrics	9
Allergy	4
Clinical Immunology	2
Other	23
Total Learners	**221**

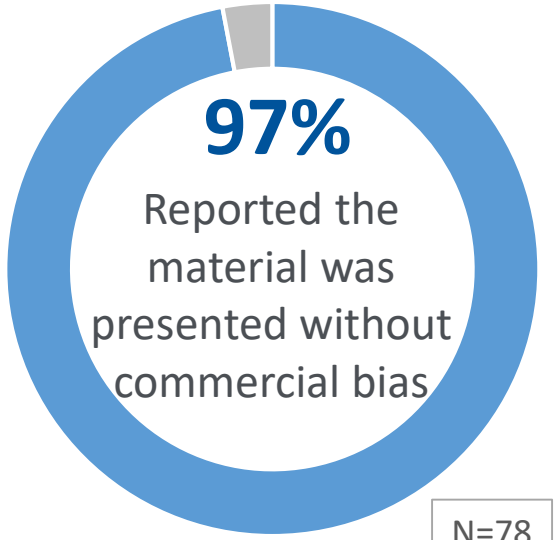
Level (2) Outcomes: Satisfaction

Final Outcomes Summary: Live Webinars and Grand Rounds

National Jewish Health

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



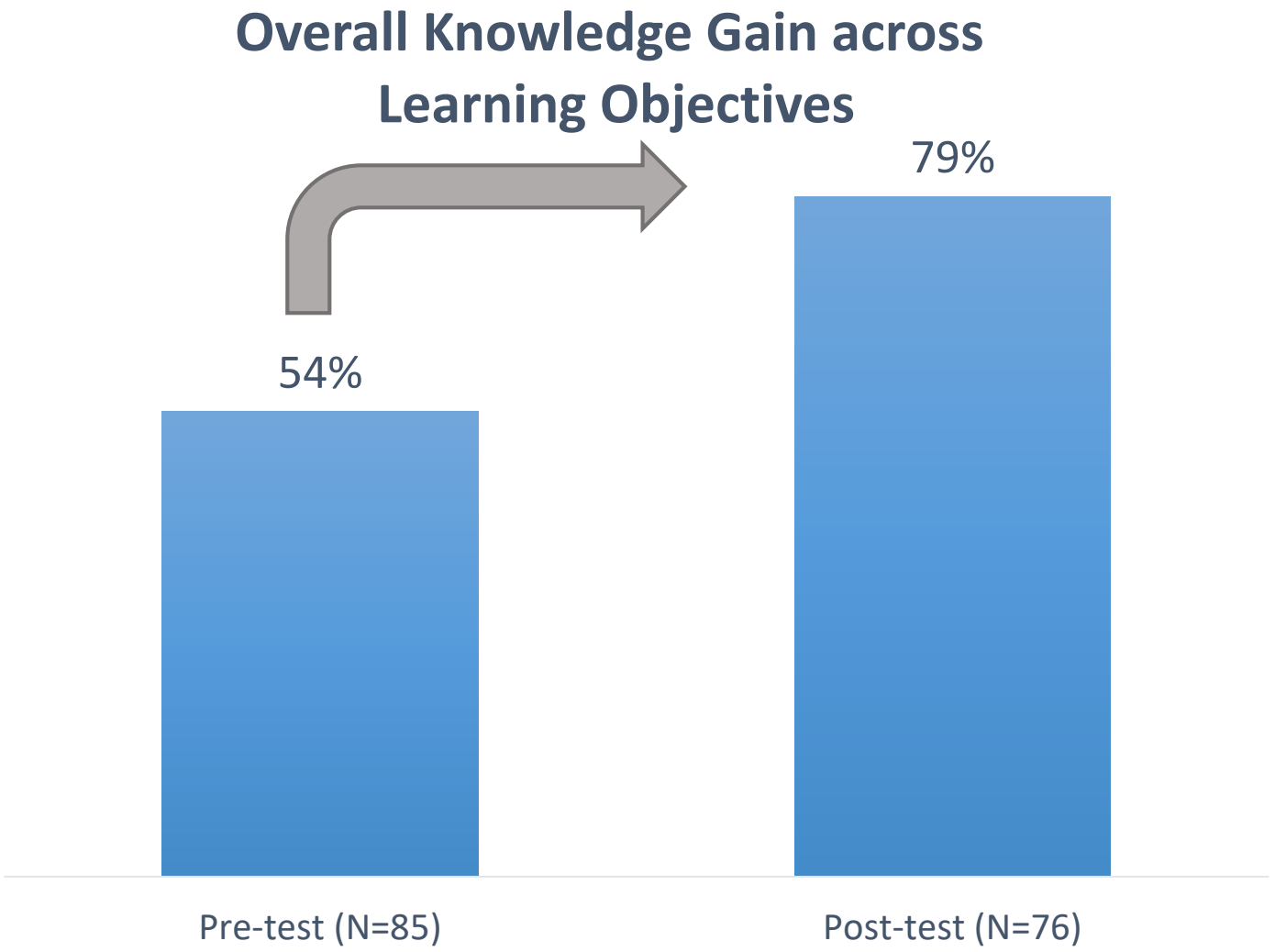


N=78

Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Live Webinars and Grand Rounds



46% Overall Relative Knowledge Gain

25% Overall Absolute Knowledge Gain

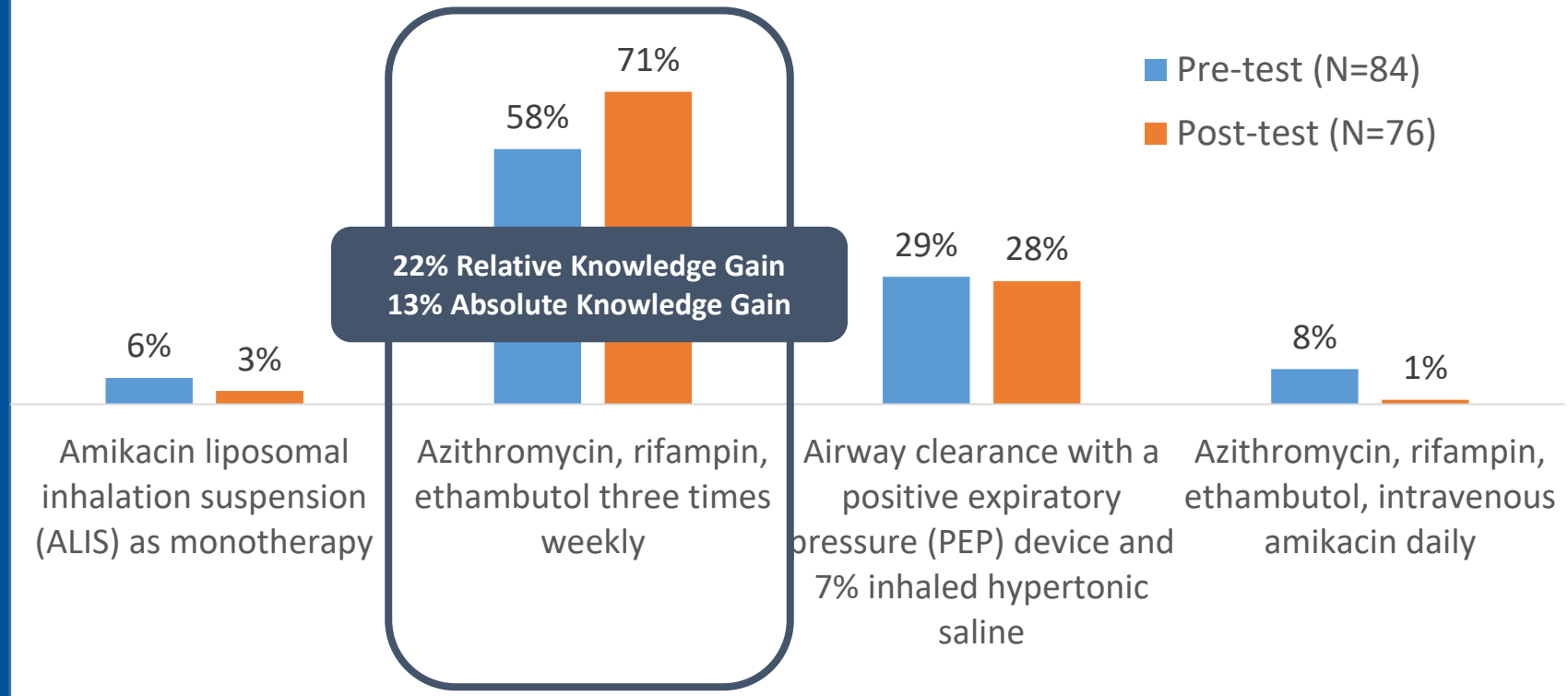
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Live Webinars and Grand Rounds

Learning Objective: *Apply best practices to the diagnosis of NTM-LD*

Question 1: A 67-year-old patient is referred to you with a long history of frequent bouts of bronchitis requiring antibiotic therapy. Between episodes of bronchitis she has persistent cough with mild sputum production and fatigue. Her sputum is culture positive for *Mycobacterium avium* which is recovered on 2 sputum specimens that are AFB smear negative and culture positive on broth medium only. Her chest CT scan shows mild bilateral bronchiectasis with scattered tree-in-bud opacities. The initial management of this patient should include:



Clinical Rationale: The patient should begin airway clearance efforts with close follow-up including symptom assessment, sputum AFB analysis and chest imaging. Persistence of symptoms, persistent positive sputum cultures for MAC and radiographic progression are all individually and collectively indications to begin guidelines based MAC therapy, in this case, azithromycin, ethambutol and rifampin.

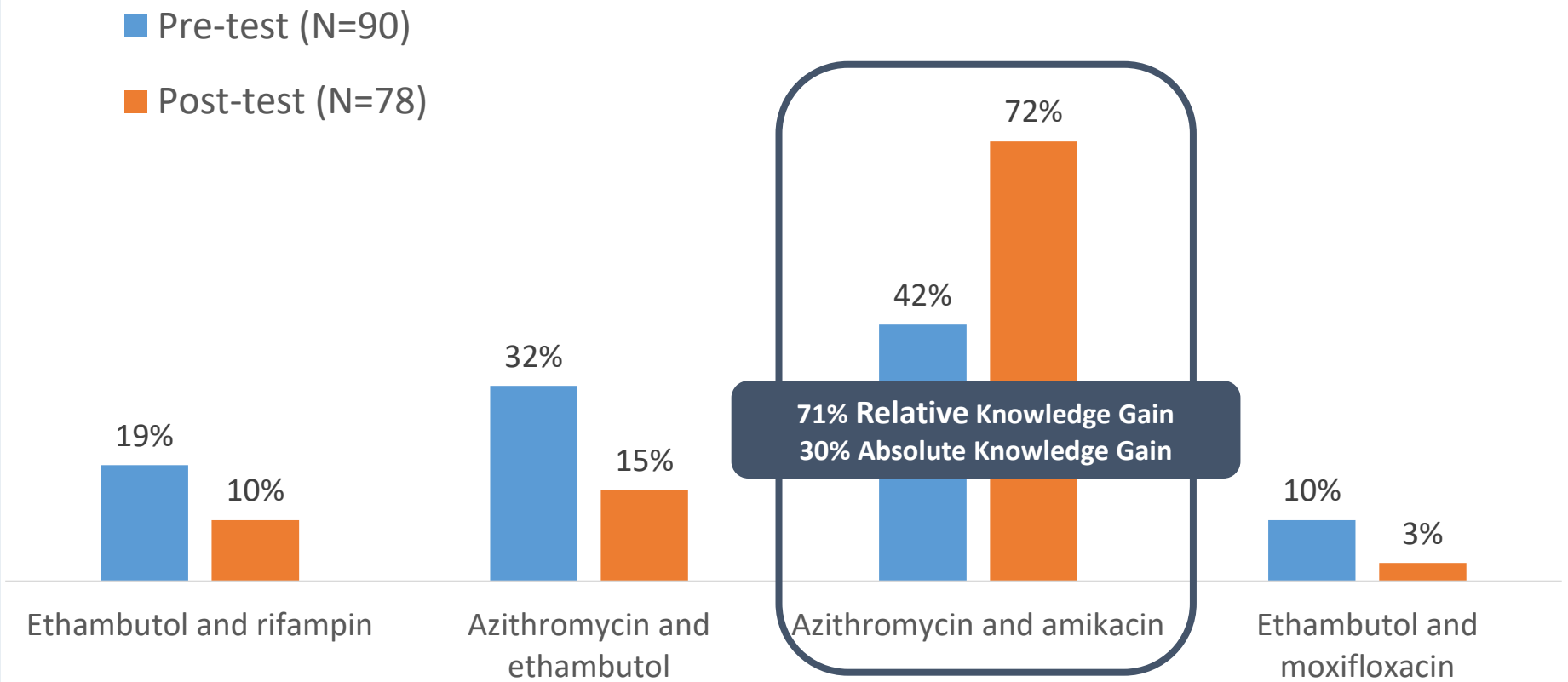
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Live Webinars and Grand Rounds

Learning Objective: *Incorporate data on current and emerging therapies into treatment strategies for NTM-LD*

Question 2: In vitro susceptibility testing for MAC is recommended for which 2 antibiotics?



Clinical Rationale: In vitro susceptibility for MAC isolates has been shown to predict treatment response (success and failure) for macrolides (azithromycin) and amikacin. No other antibiotics used for treating MAC have been shown to have that correlation.

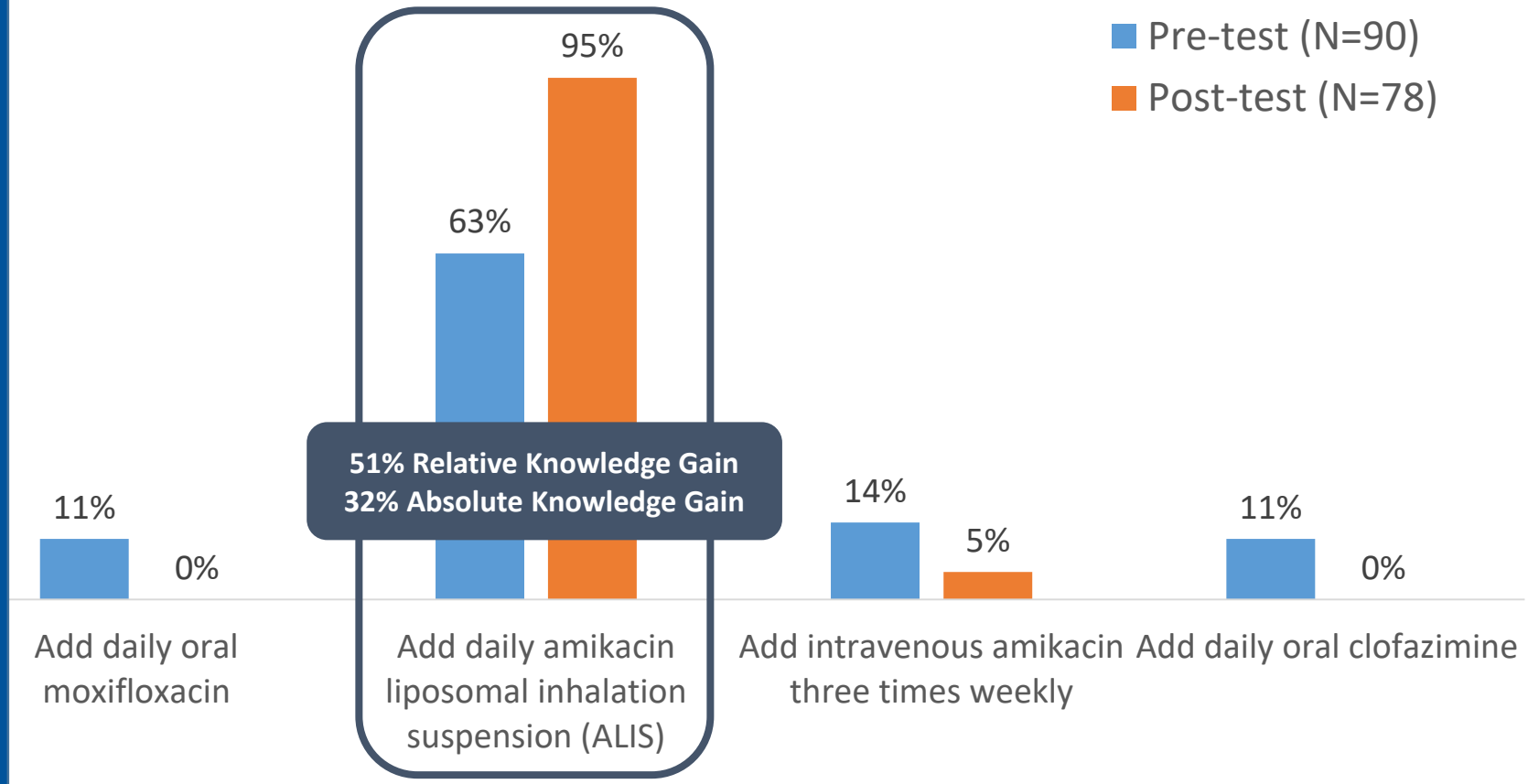
Level (3 & 4) Outcomes: Knowledge & Competence

National Jewish Health

Final Outcomes Summary: Live Webinars and Grand Rounds

Learning Objective: *Implement treatment based on the updated NTM guidelines and individual patient response and considerations*

Question 3: In patients with refractory MAC lung disease defined as persistently positive sputum cultures for MAC after at least 6 months of guidelines based therapy, what is the FDA approved recommendation for augmenting therapy according to the 2020 multi-society NTM treatment guidelines?

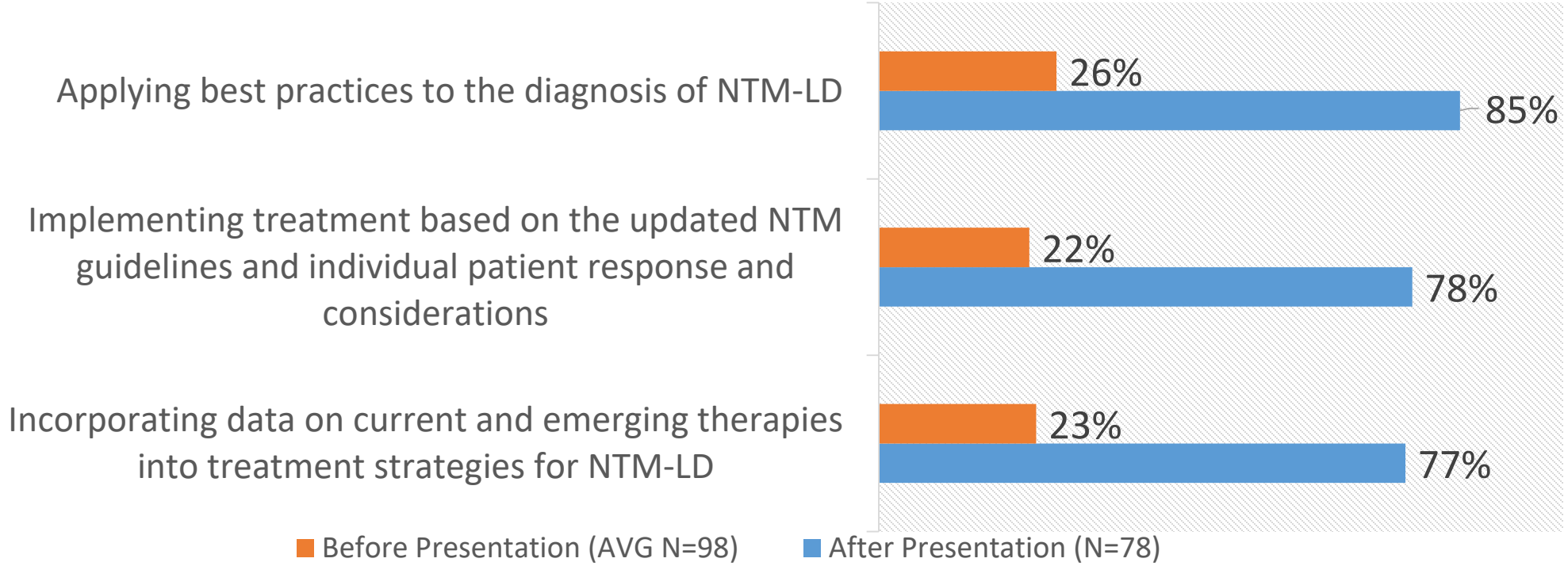


Clinical Rationale: The new NTM treatment guidelines strongly recommend adding ALIS to the treatment regimens of MAC patients who meet the definition of treatment refractory disease. This recommendation is consistent with the approval guidance from the FDA for ALIS.

Level (4) Outcomes: Competence

Final Outcomes Summary: Live Webinars and Grand Rounds

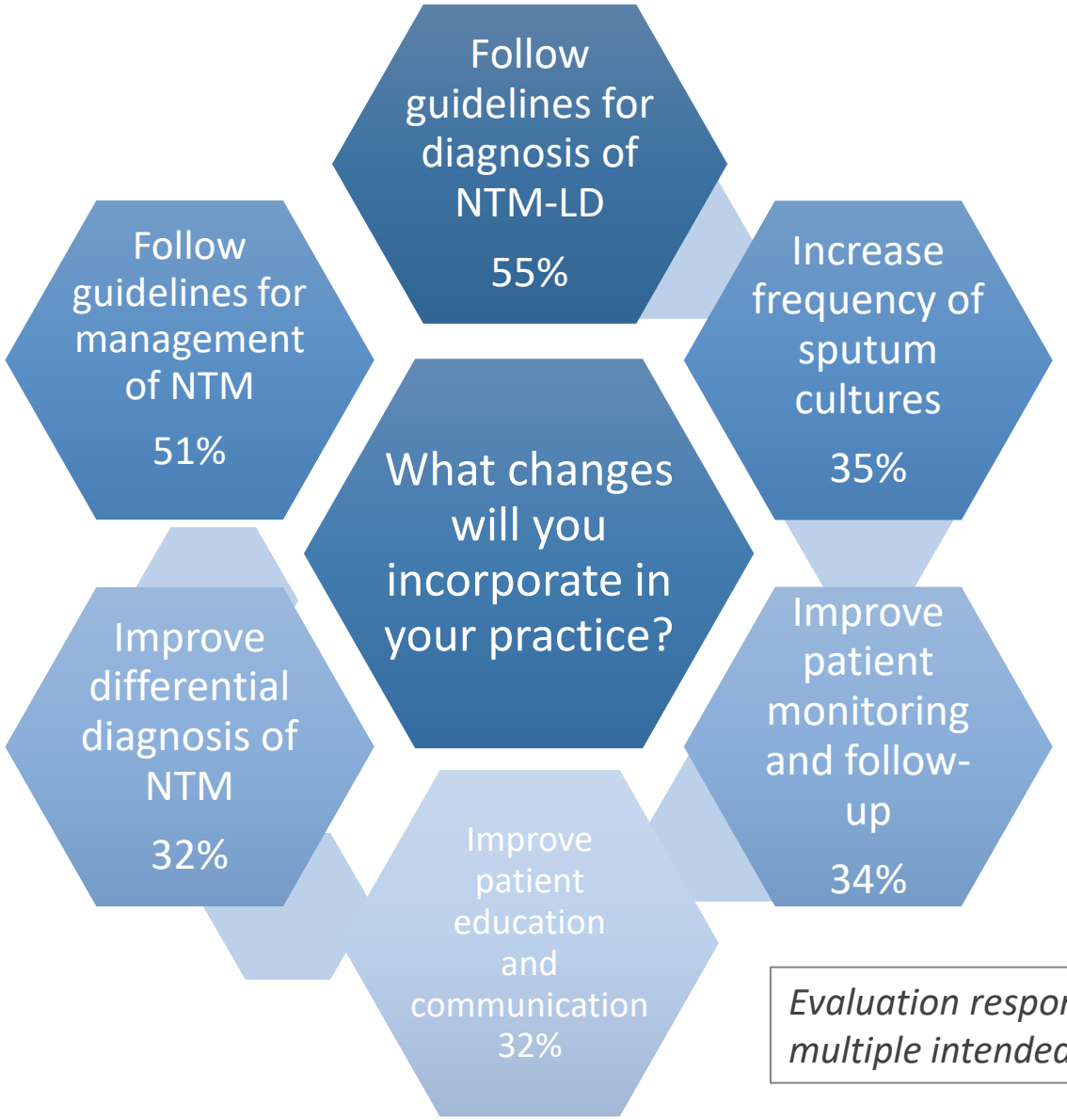
Learners reported their confidence as it relates to the learning objectives before and after the activity (Very confident – confident)



Evaluation Survey Results

Final Outcomes Summary: Live Webinars and Grand Rounds

National Jewish Health



93%

N=77

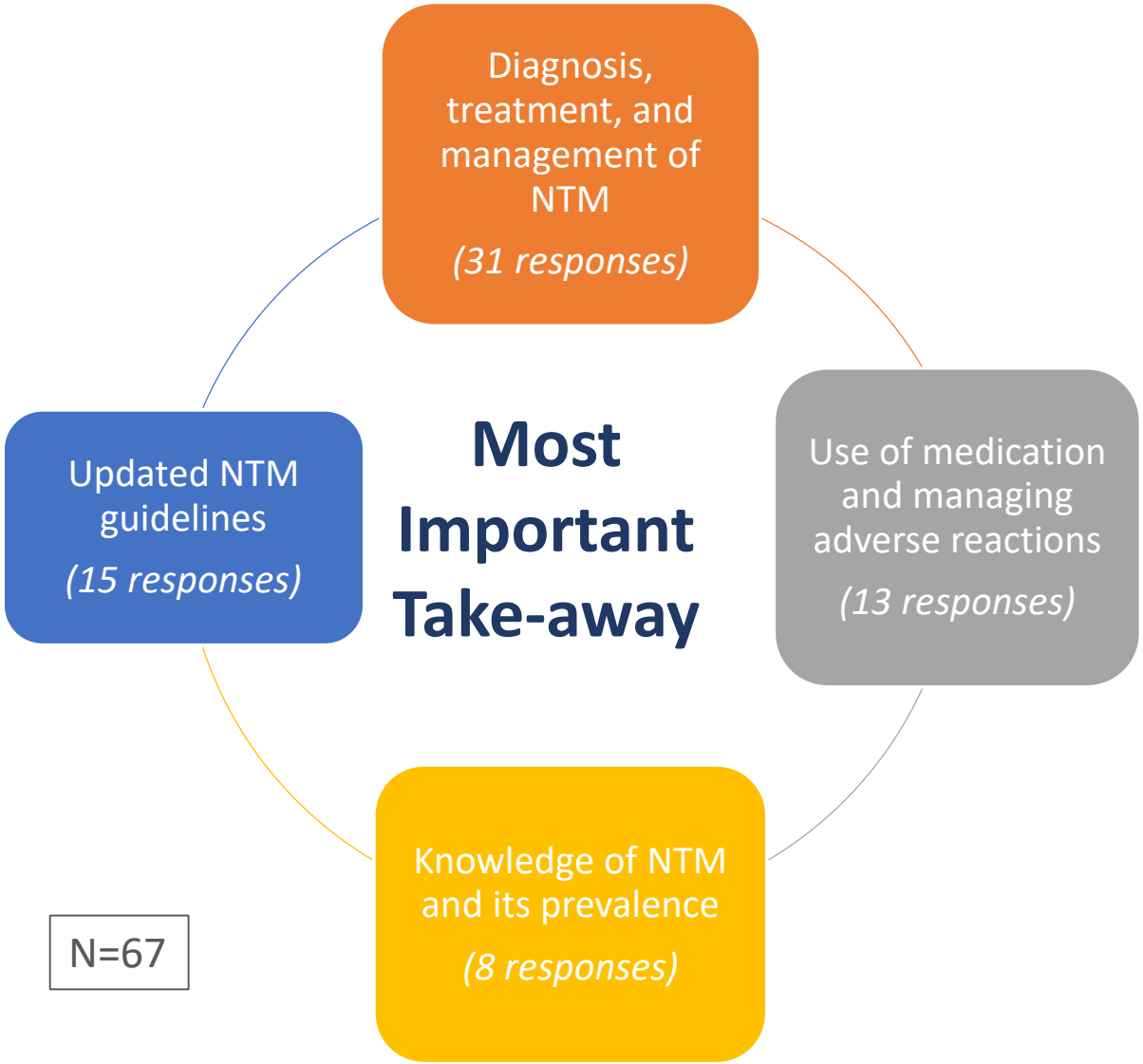
Evaluation respondents intend to make changes in practice as a result of the activity

Evaluation respondents provided multiple intended practice changes.

N=77

Evaluation Survey Results

Final Outcomes Summary: Live Webinars and Grand Rounds



"Grateful that we were able to learn from such excellent qualified professors who have clinical expertise."
- Grand Rounds attendee

"I really like the whiteboard videos."
- Grand Rounds attendee

Evaluation Survey Results

Final Outcomes Summary: Live Webinars and Grand Rounds

National Jewish Health

What barriers will the education provided help to address?

- Access to specialists to help with management
- Accessing a newly approved drug
- Cost issues
- Adherence to guideline recommendations
- Capacity to communicate goals to patients
- Informed choices when advocating for treatment
- Knowledge of treatment
- Reluctance of general infectious disease specialists to start treatment for NTM
- Treatment guidelines
- What to do when patient cough improves to a point where sputum production would be hard to test

71%

N=77

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

National Jewish Health

Evaluation Survey Results

Final Outcomes Summary: Live Webinars and Grand Rounds

What topics would you like more information about in future educational activities?
Drug-resistant MAC and *M. abscessus*
Emerging therapies
How the body's immune system reacts to mycobacteria (i.e. macrophages, nature of granulomas...)
Optimal management of other NTM infections
Microbiology and lab diagnosis
Rapid growing NTM
Case-based studies of complicated patients
Treatment of non-MAC NTM
NTM in survivors of severe COVID with chronic lung scarring

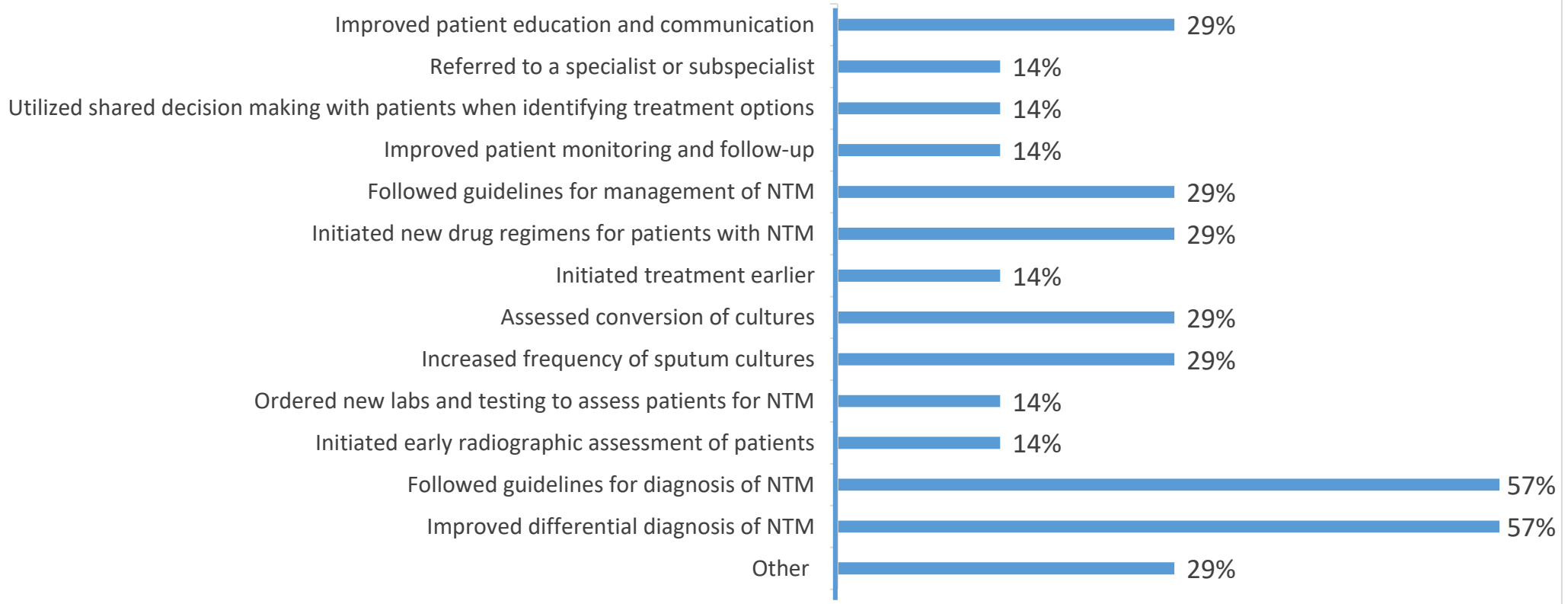
Self Reported Performance – 45 Day Survey

Final Outcomes Summary: Live Webinars and Grand Rounds

56% of respondents indicated that they have incorporated changes into their practice as a result of this activity. [N=16]

25% indicated they had not yet made changes but remain committed to making changes in practice. [N=16]

What changes have you incorporated into practice as a result of this activity?



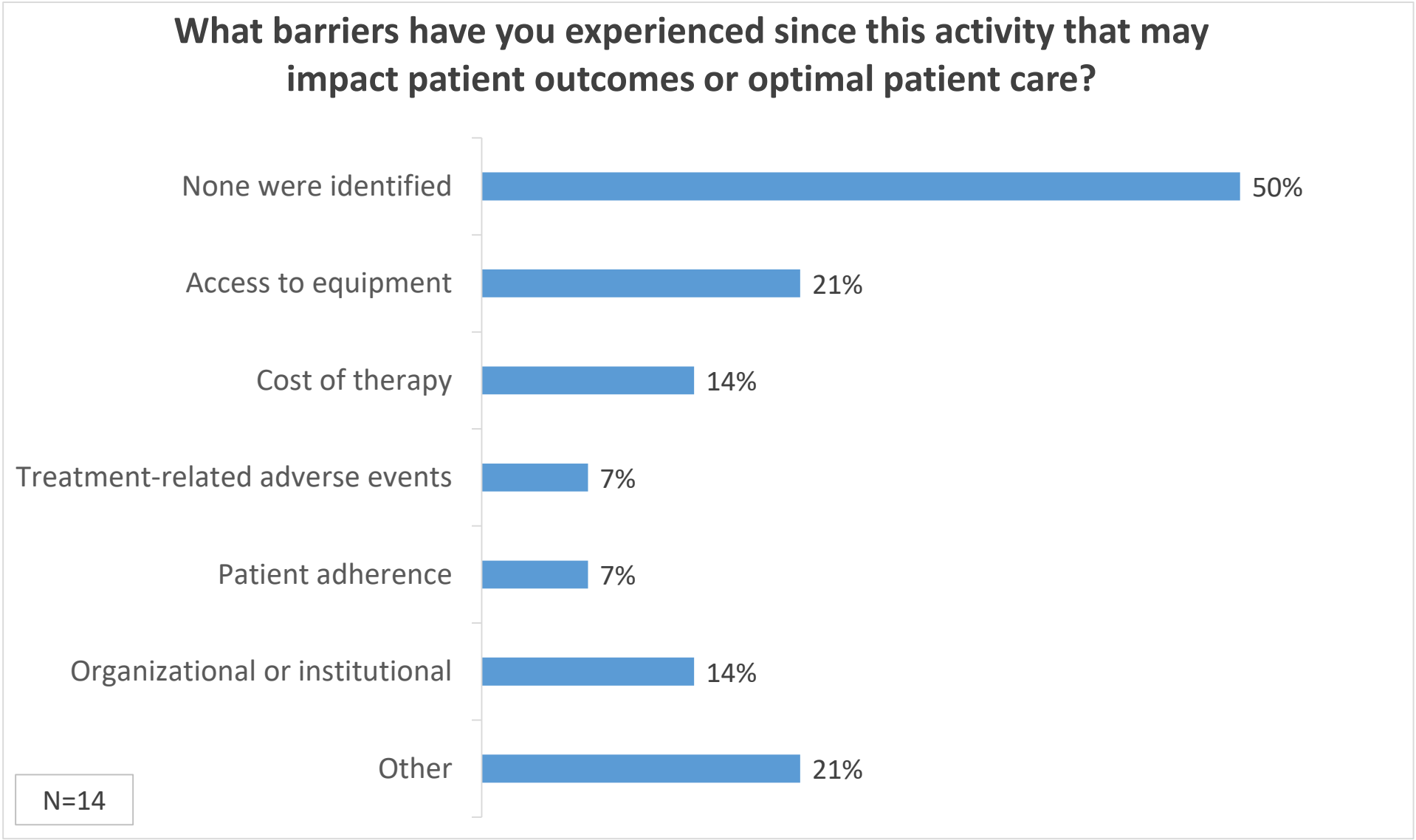
Self Reported Performance – 45 Day Survey

Final Outcomes Summary: Live Webinars and Grand Rounds

57%

N=14

Follow-up survey respondents reported their patients have benefited from what they learned in the activity



Accreditation Details

Final Outcomes Summary: Live Broadcasts and Online Enduring Activity

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

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

ACCME™
ACCREDITED WITH COMMENDATION