



**National Jewish  
Health®**

**Breathing Science is Life.®**

**Grant ID: 91661777  
Final Outcomes Summary:  
Live Virtual Hybrid Activity**

# **NTM Lecture Series** *for Providers*

**April 25-26, 2024**

## Final Live Outcomes Summary

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# Executive Summary: Activity Details

## Learning Objectives: Provider Course

1. Recognize the incidence and distribution of NTM disease
2. Identify the clinical manifestations of NTM disease
3. Differentiate the various types of NTM infections
4. Describe the guidelines for the diagnosis and treatment of NTM infections
5. Apply the latest evidence to decisions about pharmacologic and non-pharmacologic management of NTM

## Learning Objectives: Patient Course

1. Summarize the incidence, prevalence and clinical manifestations of NTM and bronchiectasis
2. Review current and emerging treatment options for NTM and associated comorbidities
3. Identify strategies to embrace a healthy lifestyle and minimize side effects
4. Discuss available resources and support networks to enhance overall quality of life for NTM patients and their families

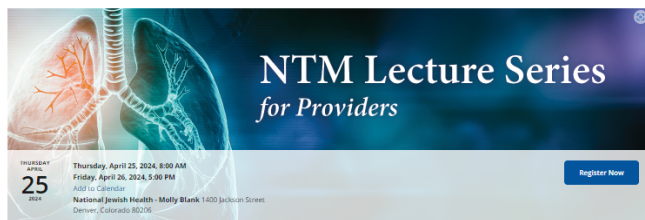
The **2024 Annual NTM Lecture Series for Providers and Patients** was held both in-person and virtually. The first two days of the conference was focused on education for providers, and the final day educated patients and their families. Faculty included key opinion leaders from National Jewish Health and institutions across the U.S. who delivered lectures with opportunity for question and answer after each presentation. Both components of the conference were recorded and endured online for paid registrants.

**Target Audience:** Pulmonologists, infectious disease physicians, family and internal medicine physicians, physician assistants, advanced practice nurses, registered nurses, and other health care professionals who diagnose and treat patients with NTM



# Marketing Strategies

## 2024 NTM Lecture Series for Providers (Hybrid Event)



The Office of Professional Education  
at National Jewish Health  
303.398.1000  
800.844.2305

### Purpose:

Nontuberculous mycobacteria (NTM) are ubiquitous in our environment. The clinical manifestations include but are not limited to chronic pulmonary infection, lymphadenitis, disseminated disease or skin and soft tissue infection. As we watch the incidence of tuberculosis drop to historically low numbers, the rates of infection due to NTM are increasing.

These infections are under recognized and cause significant morbidity and mortality. Treatment options are arduous but with the right tools, patients will improve clinically. We will have experts from across the country here to discuss this growing medical challenge. Come join us for an invaluable educational experience. **The 2024 meeting will be offered as a hybrid, with the option to attend in person or virtually.**

*National Jewish Health has a 125 year history as the leading respiratory hospital in the nation and is the only hospital devoted fully to the treatment of respiratory and related illnesses.*

[View Agenda Here!](#)

### Who Should Attend:

Family physicians and internal medicine physicians, along with pulmonologists, infectious disease physicians, physician assistants, advanced practice nurses, registered nurses, and other health care professionals who diagnose and treat patients with Nontuberculous Mycobacteria (NTM).

### For Patients:

Please let your patients know about the NTM Lecture Series for Patients and Families on Saturday, April 27!

Click below to download and print the flyer to post in your clinic and share with your patients.



Landing  
page on  
NJH  
website

Social  
Media



Targeted emails to NJH  
database and purchased  
specialty lists

 **National Jewish Health**



# Thank you to all the faculty who make this program possible!

**Edward D. Chan, MD**

Staff Physician  
National Jewish Health  
Pulmonologist, Rocky Mountain Regional VA  
Medical Center

**Charles Daley, MD (Program Co-Director)**

Chief, Division of Mycobacterial and Respiratory  
Infections  
Professor of Medicine  
National Jewish Health

**Jared J. Eddy, MD**

Assistant Professor of Medicine  
Director of Infection Prevention & Antimicrobial  
Stewardship  
Division of Mycobacterial & Respiratory Infections  
National Jewish Health

**David E. Griffith, MD**

Professor of Medicine  
Division of Mycobacterial & Respiratory Infections  
National Jewish Health

**Jennifer Honda, PhD, ATSF**

Associate Professor  
Director, NTM Center at Tyler  
University of Texas Health Science  
Center at Tyler

**Shannon Kasperbauer, MD  
(Program Co-Chair)**

Associate Professor of Medicine  
Division of Mycobacterial and  
Respiratory Infections  
National Jewish Health

**Reeti Khare, PhD**

Director, Infectious Disease  
Laboratory  
Associate Professor  
Advanced Diagnostic Laboratories  
National Jewish Health

**Tilman Koelsch, MD**

Associate Professor of Radiology  
National Jewish Health



Dr. Koelsch presenting on  
Radiologic Evaluation of  
Pulmonary NTM Infections

# Thank you to all the faculty who make this program possible!

**Amy Leitman, JD**

President  
NTM Info & Research

**Ted Marras, MD**

Associate Professor  
Director of the Toronto Western Hospital  
NTM program  
University of Toronto, Canada

**Stacy Martiniano, MD**

Associate Professor of Pediatrics  
Children's Hospital of Colorado  
University of Colorado Hospital

**Hilda Metijan, MD, FCCP**

Associate Professor  
PCD Clinical Adult Site Director  
Division of Pulmonary, Critical Care & Sleep  
Medicine  
National Jewish Health

**John Mitchell, MD**

David Endowed Chair in Thoracic Surgery  
Professor and Chief  
General Thoracic Surgery  
University of Colorado Hospital

**John Torrence**

Bronchiectasis and NTM Ambassador  
COPD Foundation

**Kevin Winthrop MD, MPH**

Professor of Medicine  
Division of Public Health, Infectious Disease,  
& Ophthalmology  
Oregon Health & Science University

**"This conference was undoubtedly among the best I have ever attended. The technical content, credentials of presenters, and overall organization of the sessions was excellent. Thank you for the work you do in this field!"**

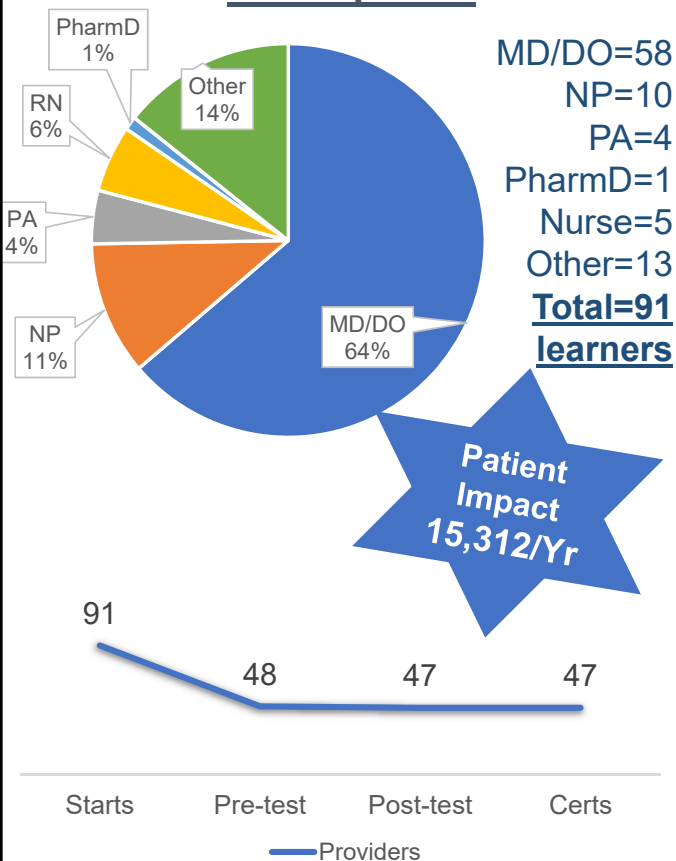
*- Live in-person provider conference attendee*



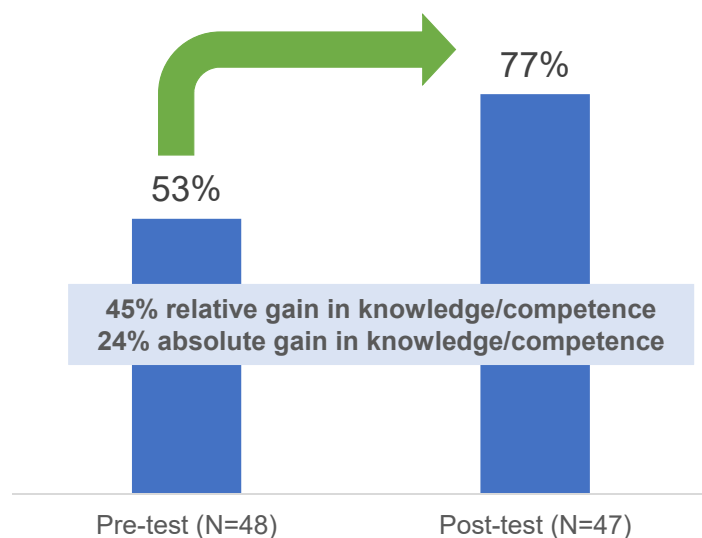
Dr. Kasperbauer moderating an expert faculty panel

# Quantitative Educational Impact Summary: Live Virtual Program

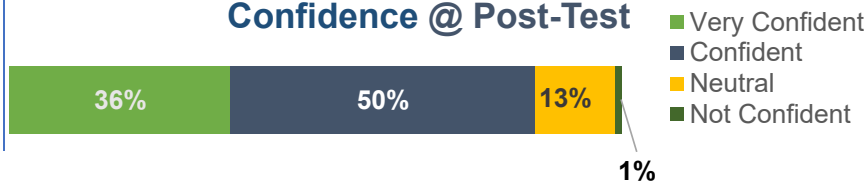
## Participation



## Overall Knowledge/Competence Gain

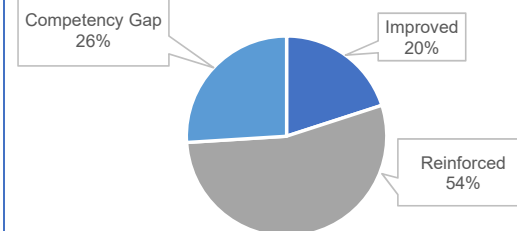


## Confidence @ Post-Test

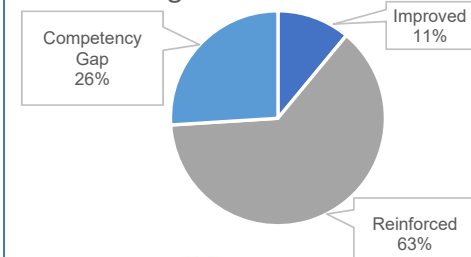


## Persistent Learning Gaps/Needs

26% of learners remained unable to apply latest evidence to make decisions about pharmacotherapy



26% of learners remained unable to correctly apply guidelines for NTM diagnosis and treatment





# Qualitative Educational Impact Summary: Live Virtual Program

## Patient Impact

**47**

Evaluation  
respondents

Who see

**319**

NTM Patients Weekly

Which translates to

**15,312**

Patient Visits Annually

## Educational Impact

### Knowledge/Competence Change by Learning Objective [N=47]



Recognition of the incidence and distribution of NTM disease  
increased by **196%**



Ability to identify the clinical manifestations of NTM disease  
increased by **48%**



Differentiation of the various types of NTM infections  
increased by **18%**



Describing the guidelines for the diagnosis and treatment of  
NTM infections increased by **38%**



Application of latest evidence to make decisions about  
pharmacologic and non-pharmacologic management of NTM  
increased by **33%**

## Practice Change

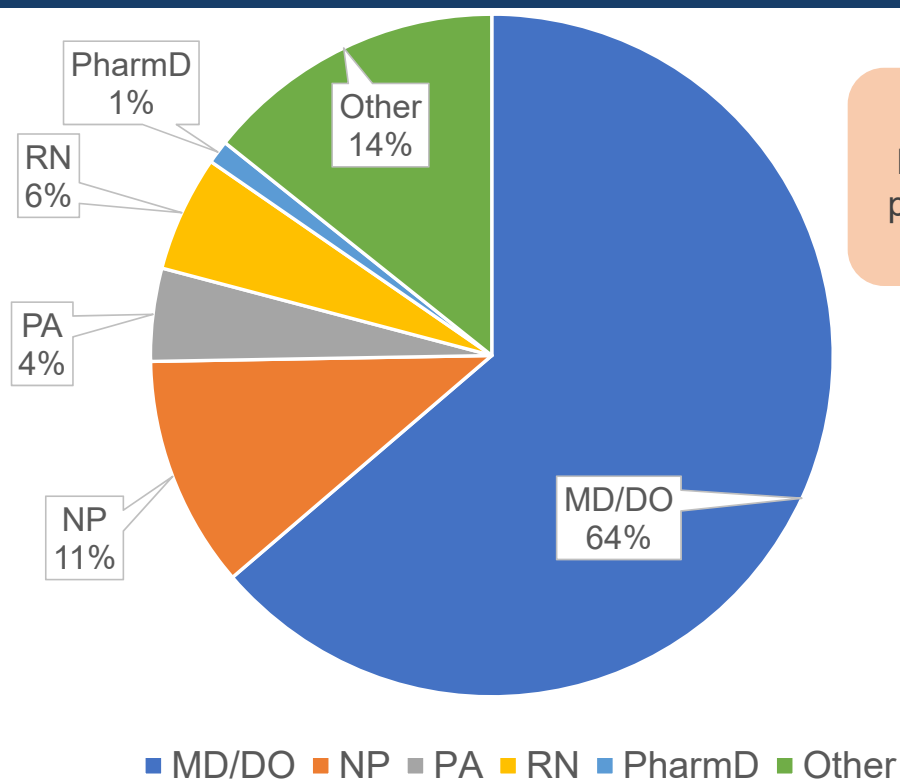
**87%**

Reported they intend  
to change their  
practice [N=47]

**35**

NTM patients have  
already benefited from  
improved practice  
*(estimate based on self-  
reported information from  
providers 45 days post-activity)*

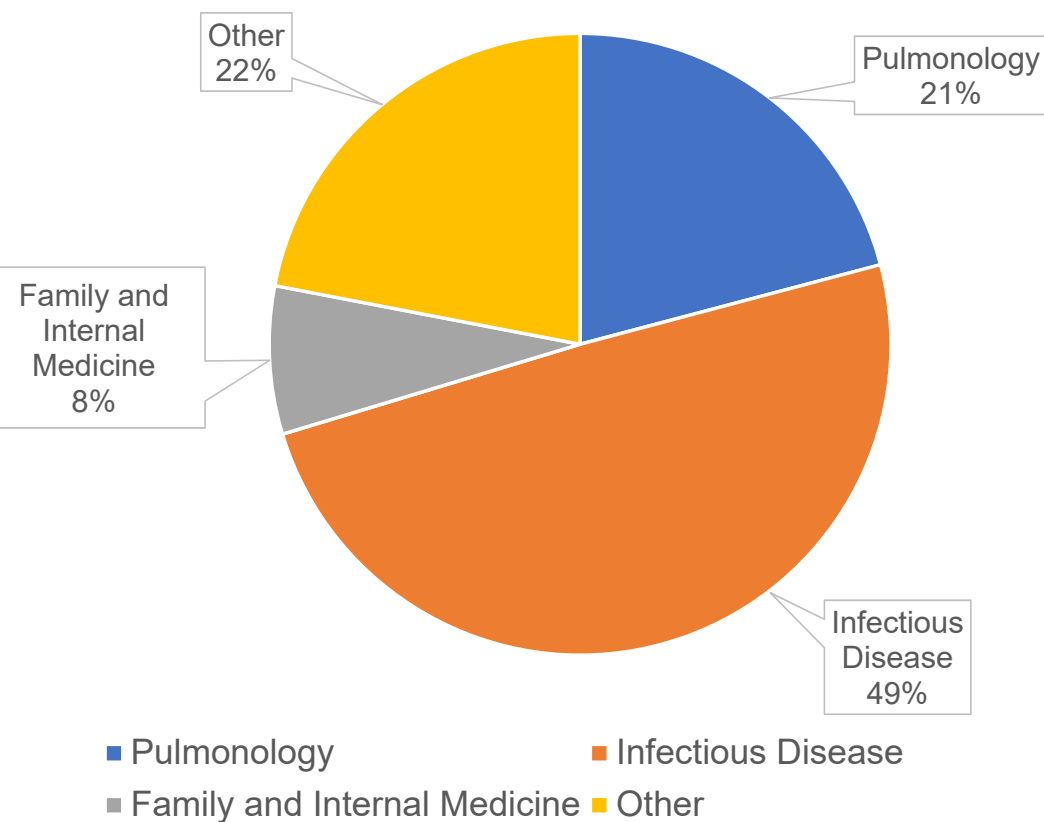
# Level 1 Outcomes: Participation by Degree



**79%** of learners were physicians and APPs

| Degree       | Live and Virtual |
|--------------|------------------|
| MD/DO        | 58               |
| NP           | 10               |
| PA           | 4                |
| RN           | 5                |
| PharmD       | 1                |
| Other        | 13               |
| <b>TOTAL</b> | <b>91</b>        |

# Level 1 Outcomes: Participation by Specialty



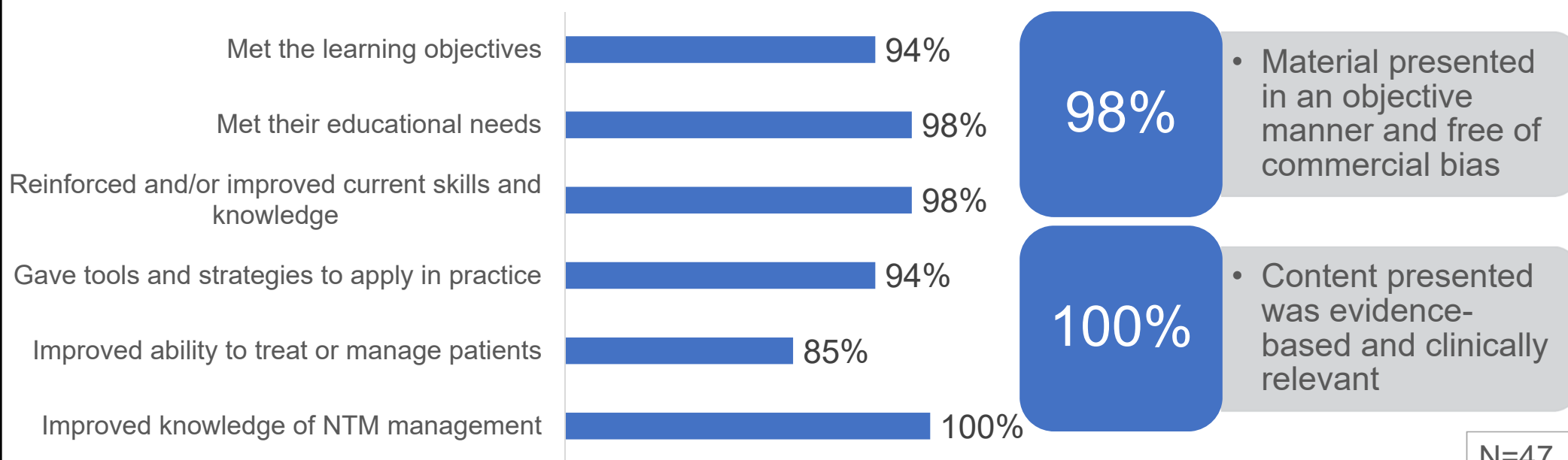
**78%** of learners were from the target audience!

| Specialty  | Live and Virtual |
|--|------------------|
| Infectious Disease   | 45               |
| Pulmonology  | 19               |
| Family and Internal Medicine                                   | 7                |
| Other<br>(Cardiology, critical care, pediatrics, not reported) | 20               |
| <b>TOTAL</b>   | <b>91</b>        |



# Level 2 Outcomes: Satisfaction

*Analysis of evaluation responses related to educational needs*  
Participants rated “strongly agree to agree” for how well the activity:

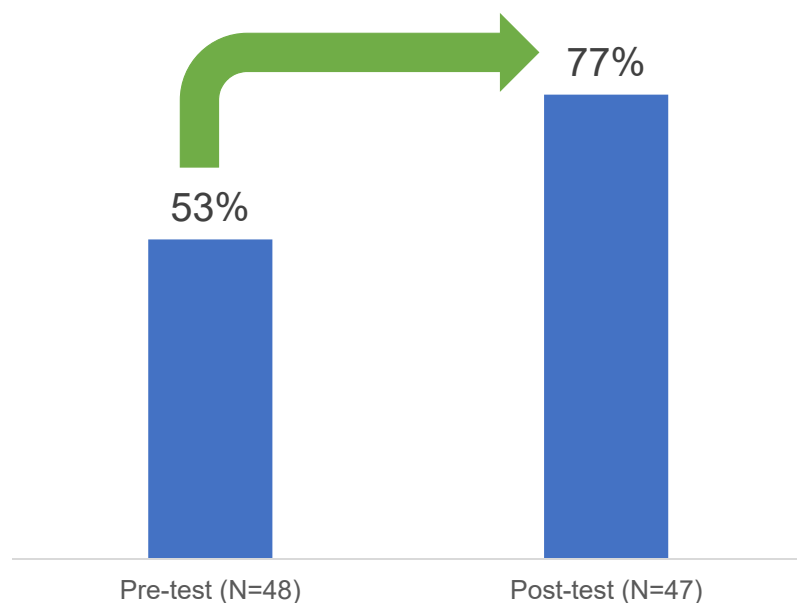


N=47

Evaluation respondents reported high levels of satisfaction related to the ability of the activity to impact practice

N=47

# Level 3/4 Outcomes: Knowledge/Competence



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

Overall relative  
knowledge/competence  
gain by question from  
pre- to post-  
activity



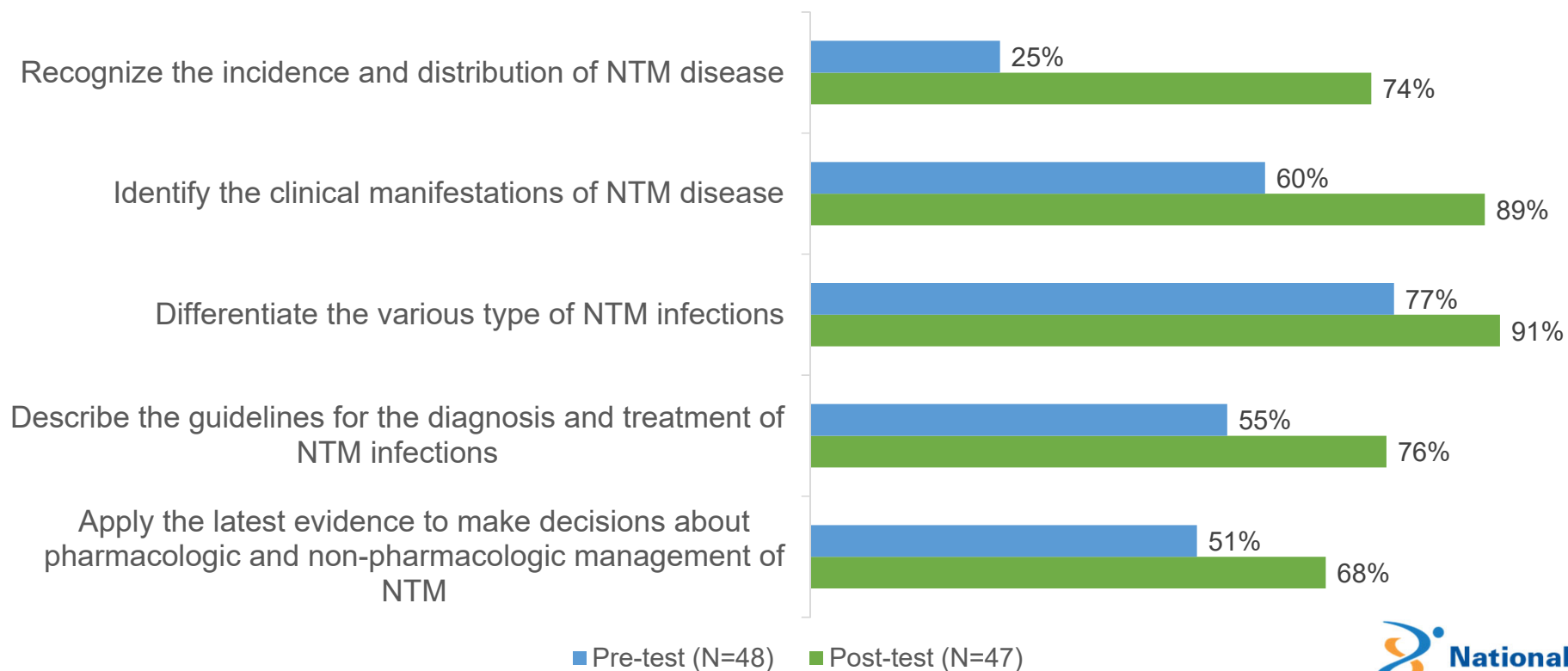
**45%**

Overall absolute  
knowledge/competence  
gain by question from pre-  
to post-activity

**24%**

# Level 3 & 4 Outcomes: Knowledge/Competence Gains by Objective

Learning Objective Knowledge Gain

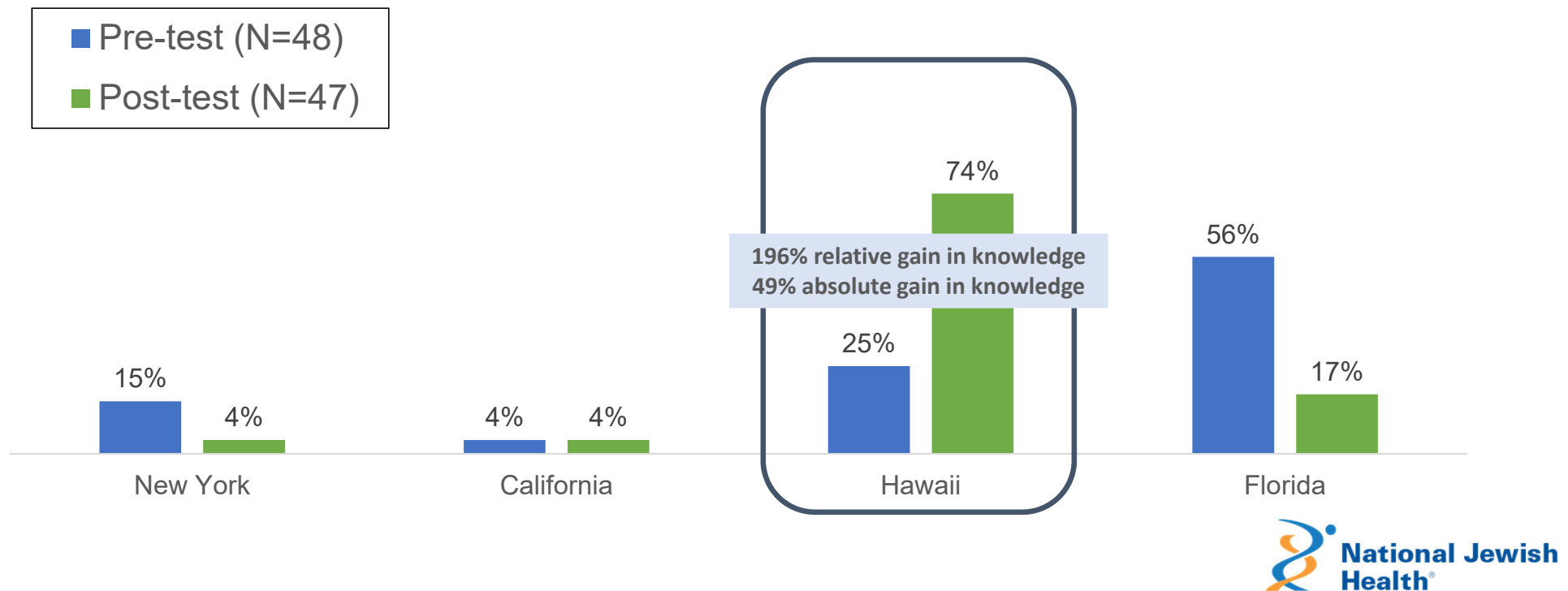




# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** *Recognize the incidence and distribution of NTM disease.*

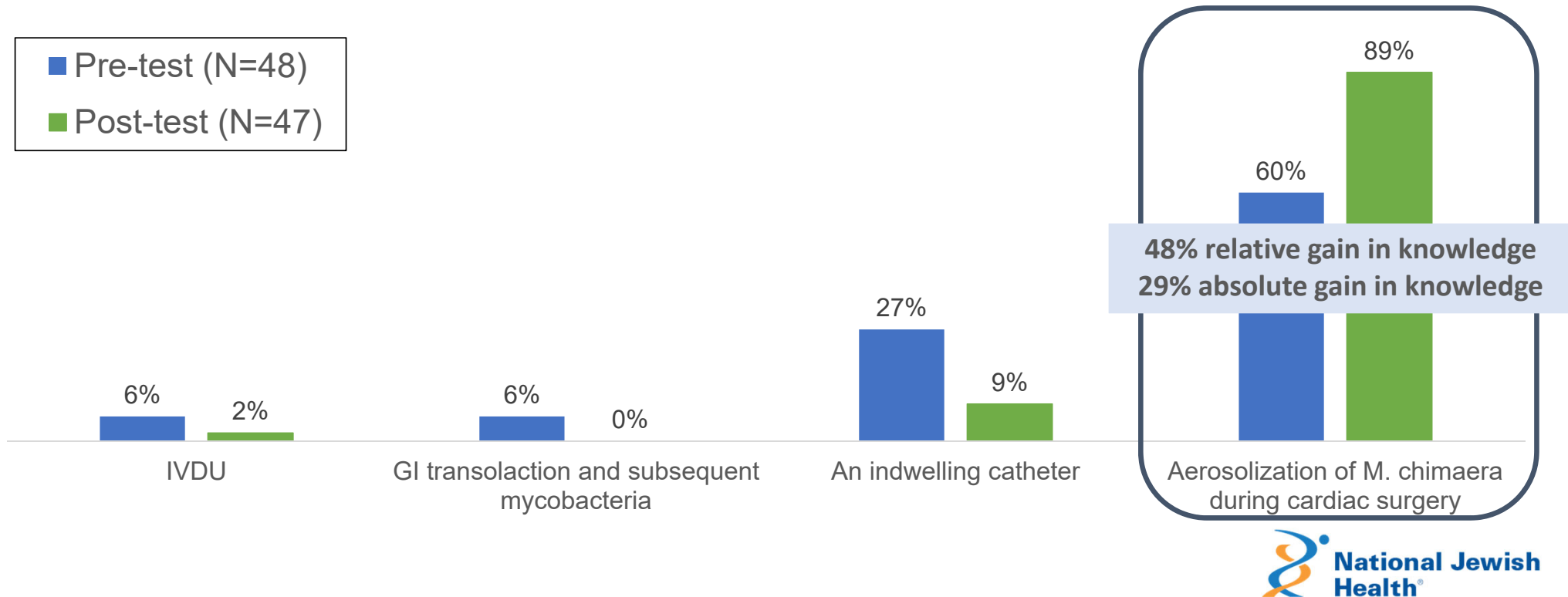
**Q1:** Which state in the US has the highest rate of NTM infection?



# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** *Identify the clinical manifestations of NTM disease*

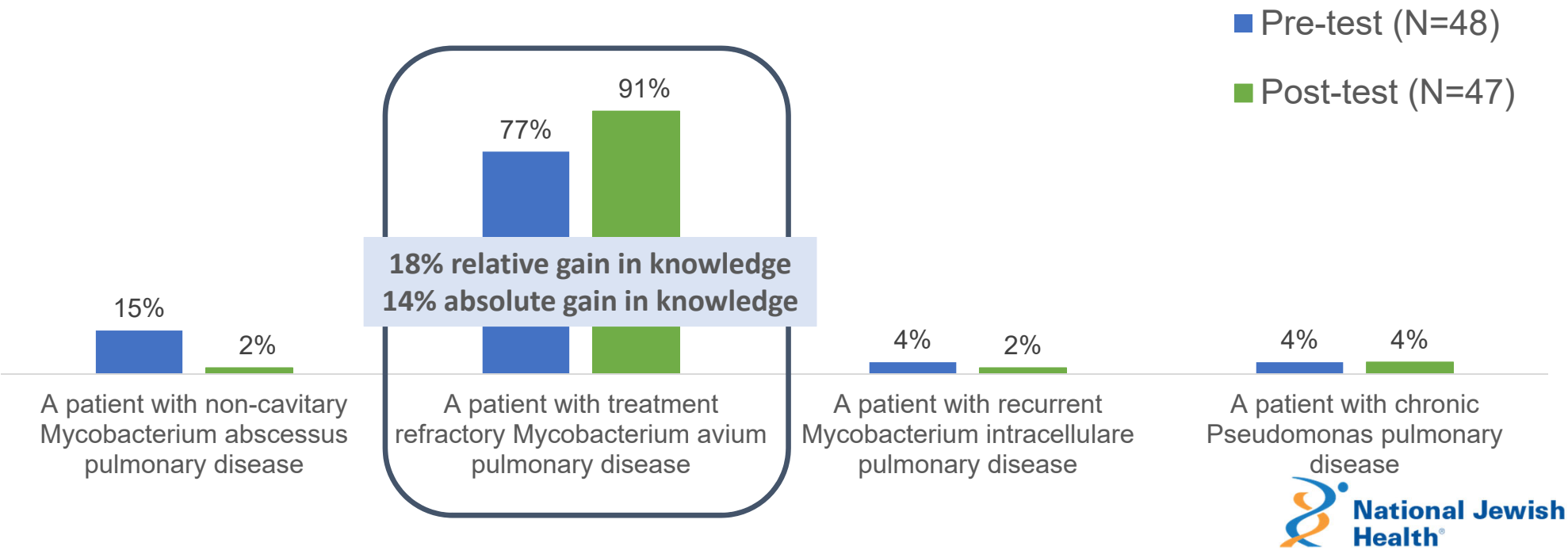
**Q2:** A patient with *M. chimaera* endocarditis most likely acquired infection from:



# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** *Differentiate the various types of NTM infections.*

**Q3:** Amikacin liposome inhalation suspension is approved by the Federal Drug Administration (FDA) for treatment of which of the following patients?

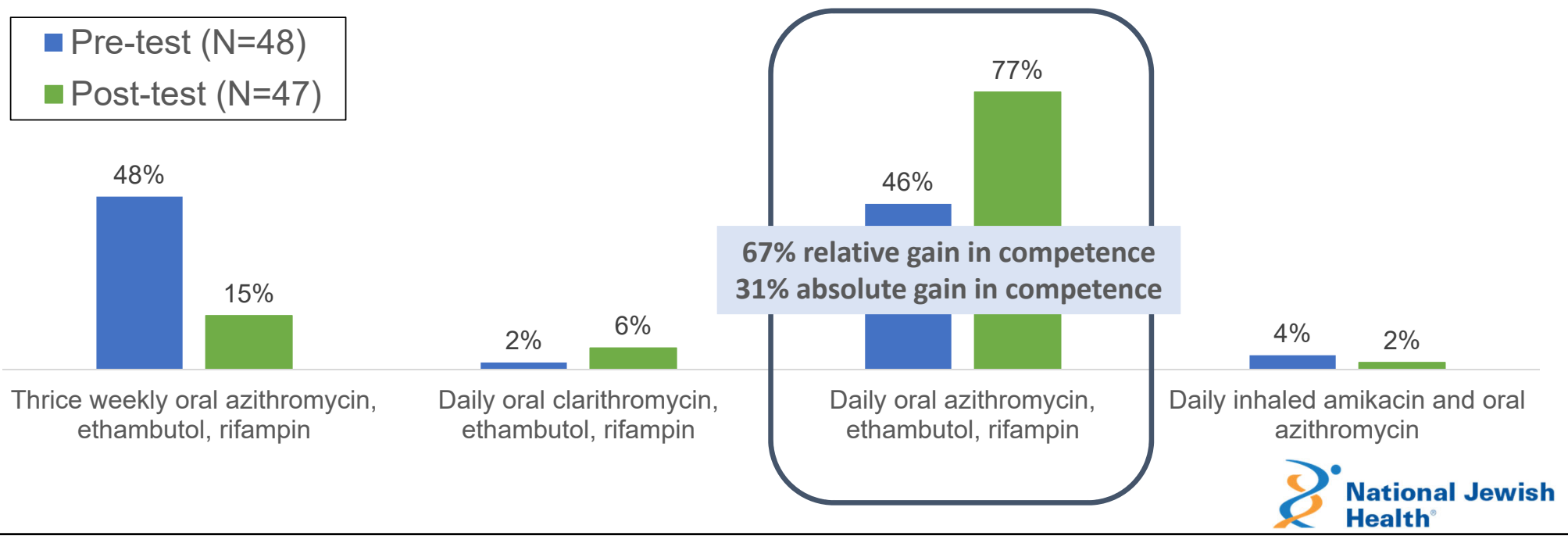




# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** Describe the guidelines for the diagnosis and treatment of NTM infections.

**Q4:** What do the CFF/ECFS consensus guidelines recommend for first-line treatment for macrolide-susceptible, non-cavitary MAC in patients with cystic fibrosis?



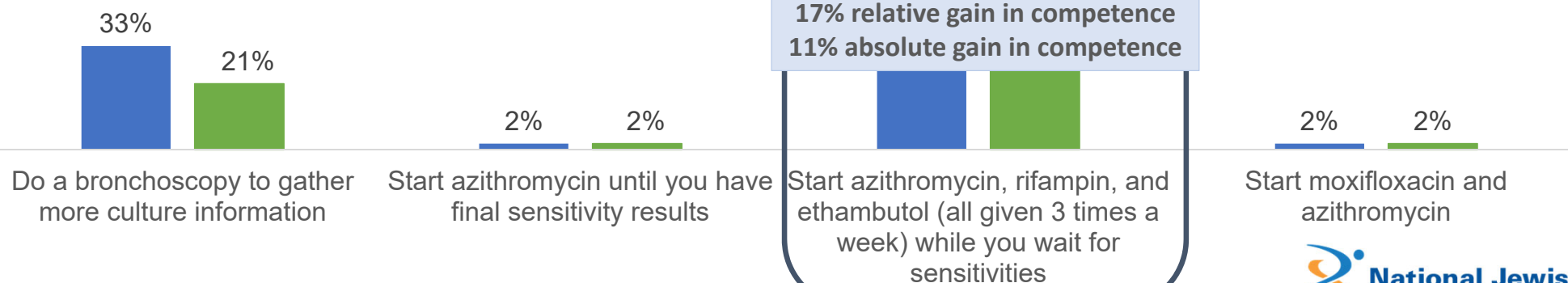
# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** *Describe the guidelines for the diagnosis and treatment of NTM infections.*

**Q5:** You have an 80-year-old patient on diltiazem, insulin, and pantoprazole with newly diagnosed pulmonary non-cavitary *M. avium* infection based on 2 smear negative/ culture positive sputums with moderate cough and fatigue. The CT scan shows only tree-in-bud changes. What diagnosis/treatment is most appropriate at this time?

■ Pre-test (N=48)

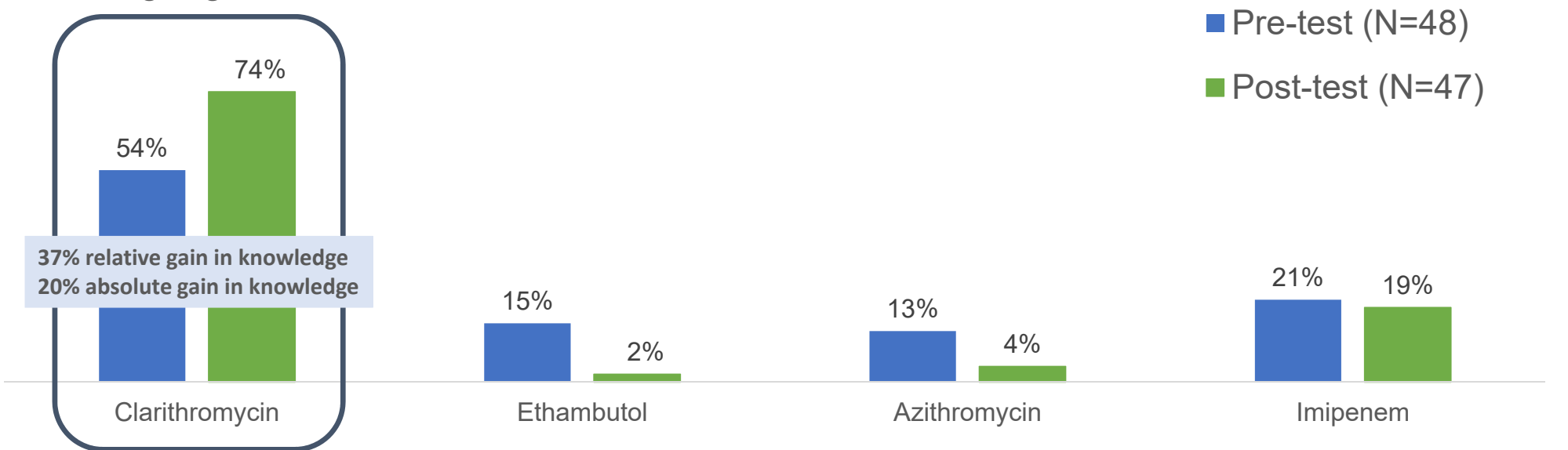
■ Post-test (N=47)



# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** Apply the latest evidence to make decisions about pharmacologic and non-pharmacologic management of NTM

**Q6:** Which medication can cause significant accumulation of rifabutin if given as part of a multidrug regimen for *M. avium* infection?



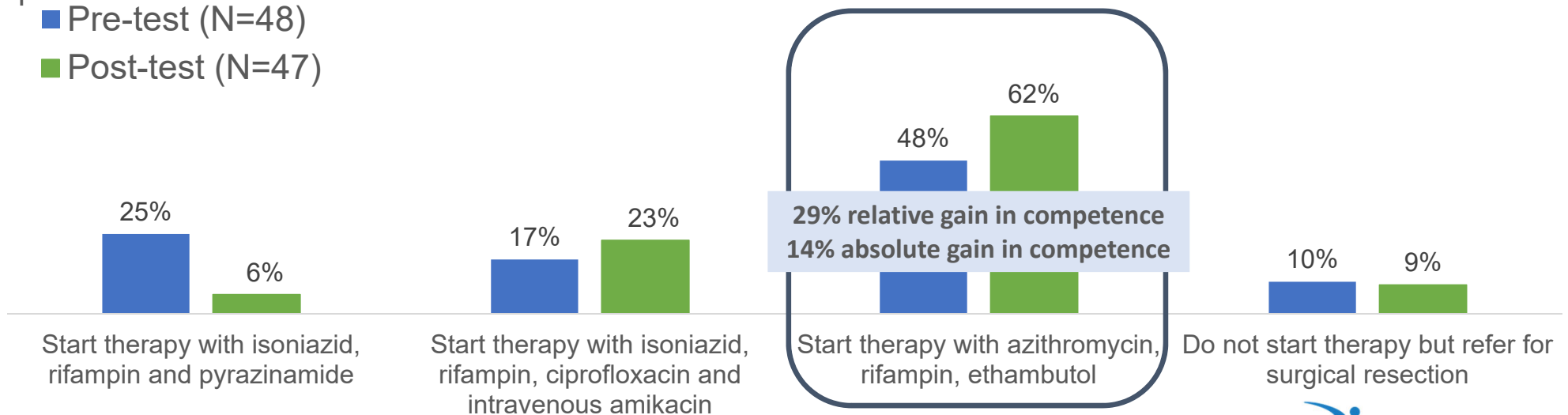
# Level 3/4 Outcomes: Pre/Post-Test

**Learning Objective:** *Apply the latest evidence to make decisions about pharmacologic and non-pharmacologic management of NTM*

**Q7:** A 70-year-old male patient grows *Mycobacterium kansasii* from three out of three sputum specimens. Chest CT scan shows evidence of fibrocavitary changes in the left upper lobe and areas of emphysema. The patient complains of shortness of breath and some weight loss but minimal cough. Which of the following is the most appropriate next step?

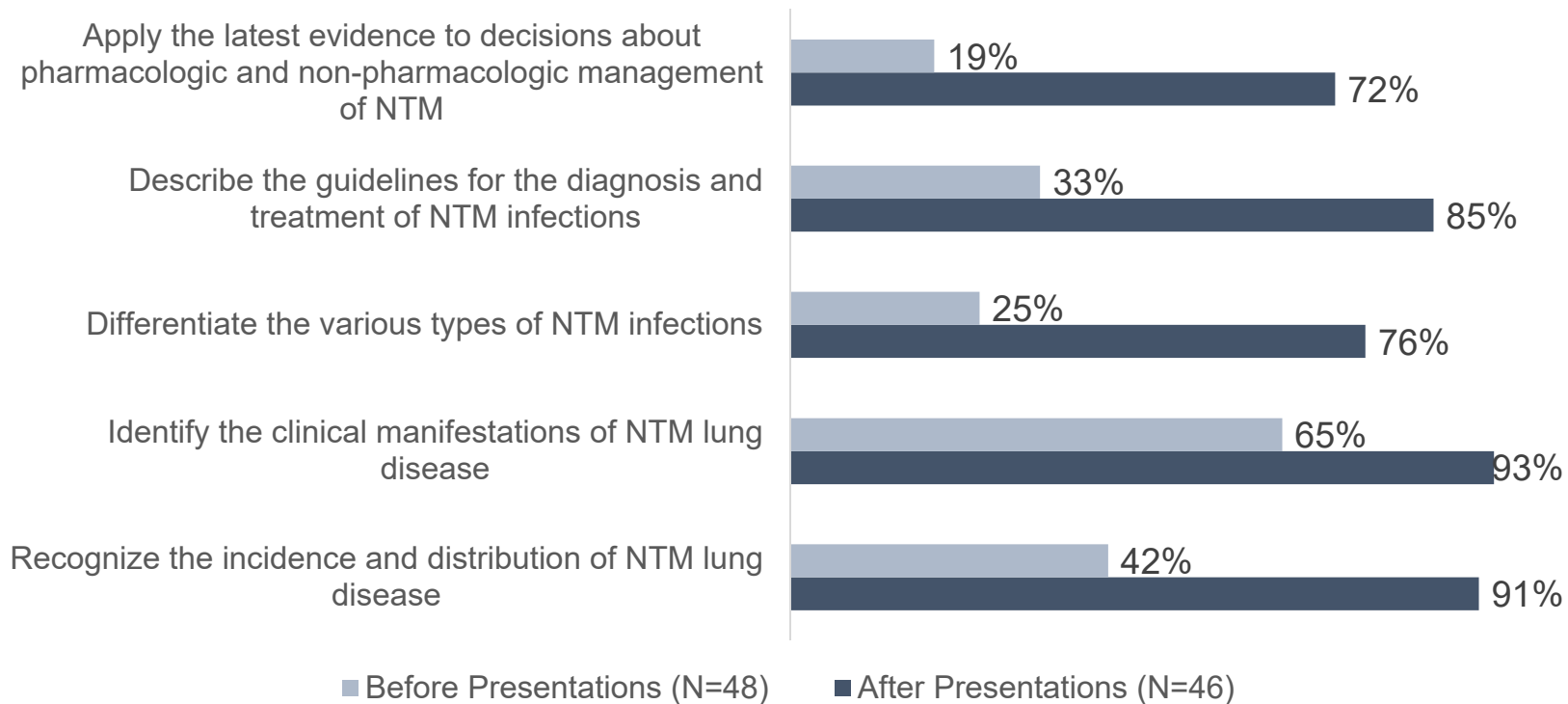
■ Pre-test (N=48)

■ Post-test (N=47)



# Level 4 Outcomes: Competence

Learners reported their confidence on the learning objectives before and after the program  
(somewhat confident – very confident)



Relative Gain  
in Confidence:  
**124%**



Absolute Gain  
in Confidence:  
**46%**



# Level 4 Outcomes: Competence

An analysis of open-ended comments demonstrates the following changes learners intend to make:

- Management of adverse effects of treatment
- I have gained a lot of knowledge to help address questions I receive on NTM.
- Identifying infection and educating patients on types of Mycobacteria
- Checking genetic changes in organisms, sending more specimens to National Jewish for that reason
- My index of suspicion for NTM lung disease in the patient population which I see has increased dramatically as a result of this conference. Additionally, I have a deeper understanding of the need for expert centers such as National Jewish Health.
- Treatment regimens selected and how to alter regimens based on side effects
- Attempt to obtain clofazimine and treat in indicated patients
- Use of percussion/expectoration devices
- Management of ALIS side effects and medication side effects
- Focus more on airway clearance

87%

N=47

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

# Program Evaluation



“There are so many valuable take-away messages ranging from the importance of greater epidemiological monitoring, the ubiquity of NTM in the environment, the challenges associated with a definitive diagnosis and the treatment nuances that need to be considered.”  
- NTM Provider Series Attendee

N=19

# Program Evaluation

## What barriers will the education provided help to address?

- Airway clearance can be done by the patient in their own home with sufficient education
- Medication side effect management strategies
- Insurance authorizations
- For US providers issues about Medicare were undoubtedly helpful
- Patient advocacy
- Issues with patient adherence to airway clearance and medications
- Barriers to obtaining medications and strategies for assisting patients with access

81%

N=47

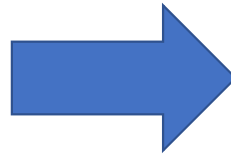
Evaluation respondents reported the activity addressed strategies for overcoming barriers to optimal patient care

## What topics would you like more information about in future educational activities?

- Causes of aspiration
- How to navigate the requirements for obtaining clofazamine
- How to overcome medication adverse effects
- More discussion of extra-pulmonary NTM
- More case discussions dealing with MAC refractory to treatment.
- Reviewing complicated cases, in particular patients with multiple comorbidities, drug interactions, etc.
- NTM infections in the non-HIV, non-SOT, immunocompromised patient
- Treatment options for chelonae, abscessus
- Understanding culture report compared to guidelines
- Updates in treatment

# Level 5 Outcomes: Performance

**71%** of follow-up survey respondents stated that their patients have benefited from information they learned in the activity.  
[N=7]



**57%** of follow-up survey respondents stated that they have already made changes in practice based on what they learned in the activity.  
[N=7]

## Examples of changes made in practice include:

- Better awareness of side effects
- Antibiotic education for patients
- Improved knowledge of bronchiectasis on CT scans
- Use of ALIS

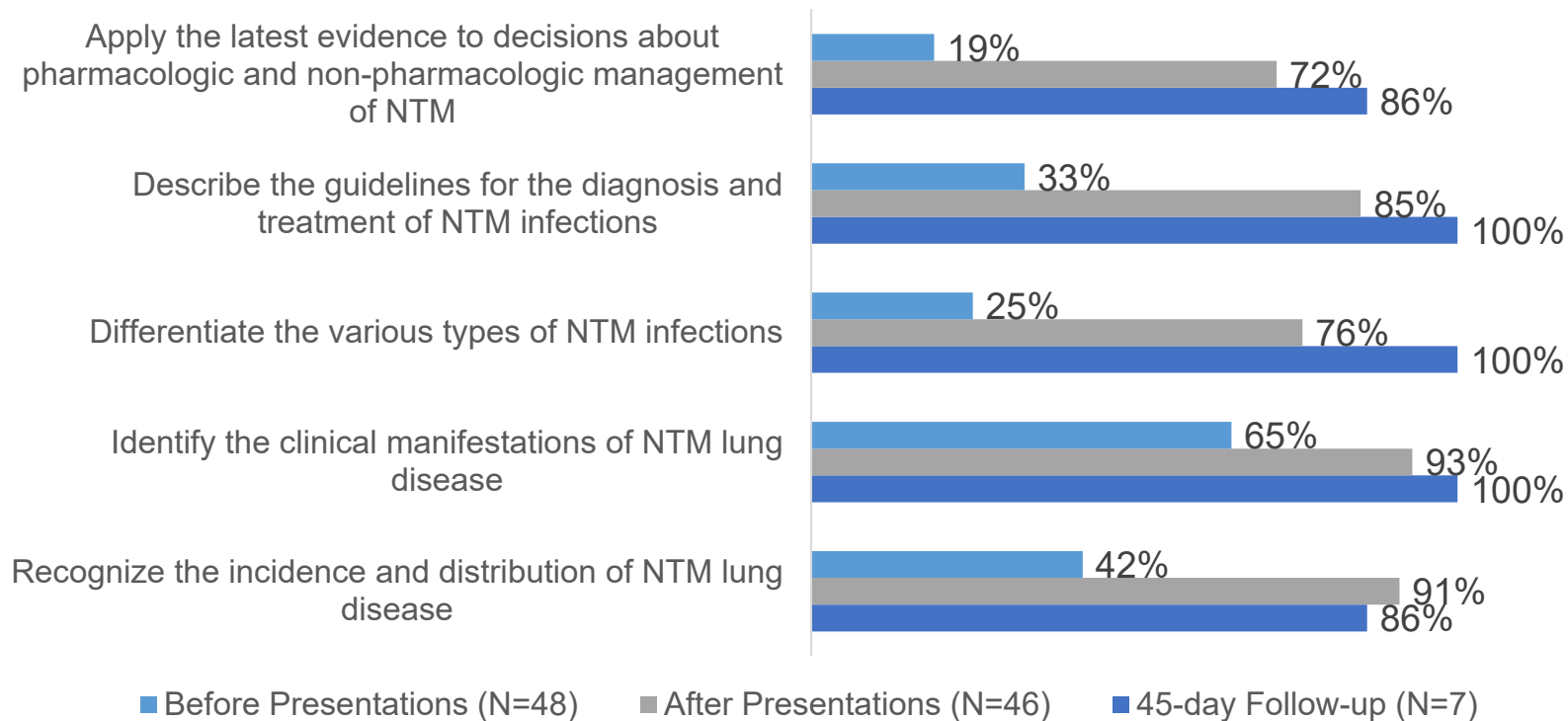
**86%**

N=7

Follow-up survey respondents reported the activity helped them address barriers they have recently encountered in practice

# Level 5 Outcomes: Performance

Learners reported their confidence on the learning objectives before and after the program, and again at 45-days following the program  
(somewhat confident – very confident)



Overall, confidence in recognizing and managing NTM remained high/ continued to increase among survey respondents 45 days after the program.



# Accreditation

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

NJH designates this live activity for a maximum of 13.75 *AMA PRA Category 1 Credits™*.

Provider approved by the California Board of Registered Nursing, Provider Number 12724, for 13.75 contact hours.







**National Jewish  
Health®**

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# NTM Lecture Series

*for Patients and Families*

**April 27, 2024**



# Patient Course Evaluation

After participating in this activity, what changes might you incorporate into your daily life?

- Focus more on nutrition and stress management.
- Do a better job with airway clearance.
- Strength building exercises in addition to cardio.
- Join some of the support groups to chat with other patients about their conditions and what is helping them.
- Continue to do airway clearance with extra care of cleaning devices and being aware of environmental factors.
- Encouraged to persist in being diligent in prescribed therapies.

*"Thank you SO much to everyone involved in putting on this seminar. I felt so acknowledged and did not feel like I was talked down to. The physicians put everything into plain language so that it made it easier for us non-health professionals to understand the topics ."*

- Patient course attendee

**440**

In-Person  
and Virtual  
Attendees

**99%** of attendees  
reported the conference  
addressed topics that  
mattered to them [N=113]

# Patient Course Evaluation

## What factors make it difficult to follow the treatment plan(s) prescribed by your providers?

- Cost of some of the clearance meds challenge my Coverage D limits.
- Doctors and healthcare providers are not easily available for questions or assistance.
- Making time for the airway clearance.
- I often have side effects from medications. I am always fatigued and have shortness of breath that prevents me from using the nebulizer for medication and saline.
- Extreme fatigue, muscle weakness, nausea and aversion to food.
- Concern about lab reports and weight loss.

## What have you found supports you most in following the treatment plan(s) prescribed by your providers?

- A supportive and creative provider.
- Retreats and conference have helped me a lot.
- NTM Support Group meetings and members.
- Empathy, encouragement, education.
- Having a complete understanding of the mechanisms of disease and the principles behind the recommendations.

*"It was truly a wonderful series. My thanks to all who made it happen. The speakers were great, and the talk by John Torrence, who I know through Bronchiectasis and NTM 360, inspired me since he is a person just like me or anyone else who has these lung issues."*

- Patient attendee

*"Once again, it was an extraordinarily helpful conference. As an Emerita Professor at Columbia University, I was deeply impressed with the MDs' emphasis on doing one's best as a patient, but also being tolerant of the difficulties these diseases can cause patients."*

- Patient attendee