THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

February 6-9, 2019

Keystone Conference Center | Dillon, Colorado

Executive Summary: Activity Details

February 6-9, 2019 Keystone, Colorado

The National Jewish Health 41st Annual ***The Pulmonary and Allergy Update*** highlighted insights and recent advances in immunology, pulmonary medicine, asthma, and allergy presented by faculty from the leading respiratory hospital in the nation. Participants had the opportunity to network with colleagues and nationally recognized experts, and learn the latest updates on management and treatment options for patients.

Features included:

- ✓ Workshops that complimented lectures provided great opportunities to discuss key issues and apply learning with case reviews by National Jewish Health expert faculty
- ✓ Interactive didactic presentations
- ✓ Case-based learning
- ✓ Automated Response System (ARS)

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

National Jewish Health Presenting Faculty

Ron Balkissoon, MD, MSc, DIH, FRCPC
Pulmonary Consultant, Division of Pulmonary, Critical Care & Sleep Medicine, Department of Medicine

Charles Daley, MD
Chief, Division of Mycobacterial & Respiratory Infections, Professor, Department of Medicine

James Finigan, MD
Director, The Respiratory Centers of Excellence, Medical Director, Lung Cancer Screening Program, Associate Professor, Division of Pulmonary, Critical Care & Sleep Medicine, Division of Oncology, Cancer Center, Department of Medicine

Patricia George, MD
Associate Professor, Director, Pulmonary Hypertension Program, Division of Pulmonary, Critical Care & Sleep Medicine, Department of Medicine

Flavia Hoyte, MD
Associate Professor, Director, Allergy & Clinical Immunology Fellowship, Department of Medicine, Division of Allergy & Clinical Immunology

Bruce Lanser, MD
Assistant Professor, Director, Pediatric Food Allergy Program, Associate Director, Pediatric Allergy Fellowship Program, Department of Pediatrics, Division of Allergy & Clinical Immunology

Laurie Manka, MD
Assistant Professor, Department of Medicine, Division of Pulmonary, Critical Care & Sleep Medicine

Richard Martin, MD *(Conference Co-Chair)*
Chairman, Department of Medicine, Professor, Edelstein Chair in Pulmonary Medicine, Department of Medicine

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

National Jewish Health Presenting Faculty

Richard Meehan, MD, FACP
Professor, Department of Medicine, Division of Rheumatology, Co-Director, Post-Deployment Lung Health Center, Autoimmune Lung Center

Harold Nelson, MD *(Conference Co-Chair)*
Professor, Department of Medicine

Karin Pacheco, MD, MSPH
Associate Professor, Department of Medicine, Division of Environmental & Occupational Health Sciences

Cecile Rose, MD, MPH
Professor, Director, Division of Environmental & Occupational Health Sciences, Department of Medicine

Carah Santos, MD
Assistant Professor, Division of Pediatric Allergy & Clinical Immunology, Department of Pediatrics, Division of Allergy & Clinical Immunology, Department of Medicine

Jeffrey Swigris, DO, MS
Associate Professor, Department of Medicine, Division of Pulmonary, Critical Care & Sleep Medicine

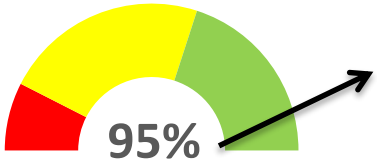
Michael Wechsler, MD, MMSc
Co-Director, The Cohen Family Asthma Institute, Professor, Department of Medicine, Division of Pulmonary, Critical Care & Sleep Medicine

Pamela Zeitlin, MD, MPhil, PhD *(Conference Co-Chair)*
Silverstein Chair, Department of Pediatrics, Professor of Pediatrics

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Dashboard: Activity Impact

Improved Ability to Treat and Manage Patients

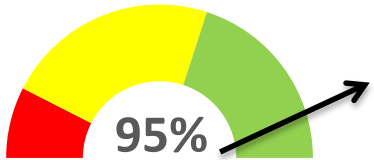


129 Learners

81% Prescribers

- 73 MDs/DOs
- 14 PAs
- 18 NPs

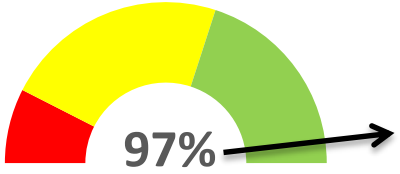
Enhanced Ability to Apply Learning Objectives to Practice



Overall relative knowledge gain from pre- to post-activity

51%

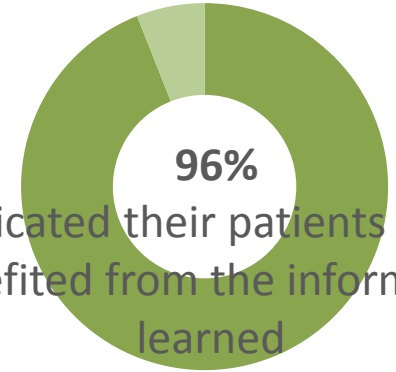
Intend to Make Changes to Practice



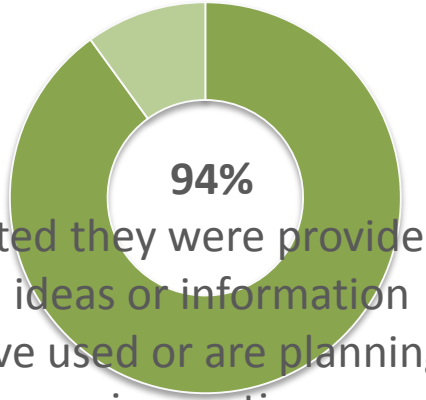
Estimated # of patients seen per week by participants

3200+

Overview: Self-Reported Performance (45-Day Survey Results)



indicated their patients have benefited from the information learned



indicated they were provided new ideas or information they have used or are planning to use in practice

The **top three changes** respondents have made or intend to make (for those that had not seen any patients in that target therapeutic area within the 45-day time period) are:

1. Incorporate different diagnostic strategies into patient evaluation
2. Modify treatment plans
3. Change my screening/prevention practice

N=48

Evaluation Results: Attendee Feedback

Key Lessons Learned

- Use of biologics in severe asthma
- Use of bronchoscopy in refractory asthma
- Potential novel therapy for COPD
- Treatment/Pulmonary rehab for IPF
- MICs for different anti NTM antimicrobial agents

Needs for Further Education

- EoE
- Contact Dermatitis
- Cystic Fibrosis
- Sleep Medicine
- Sinus Disease, ABPA
- MAC
- Biologics
- Diagnostic Testing

What Attendees are Saying

"This was my first time attending this meeting. It was excellent and very relevant to practice. I look forward to attending again."

"Continue providing a fantastic venue for learning about current and future approaches to asthma, allergy, immunology."

"Have been to 7 prior keystone conferences. It is excellent and I recommend to my partners."

"All were very good in getting the info down to what it means in practice -practical applications."

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Overall Conference Objectives

1. Review updates to best practices and guidelines in diagnosis and assessment of a variety of chronic diseases and conditions.
2. Discuss the latest treatments and key self-management strategies for a variety of chronic diseases and conditions.
3. Describe considerations and updates in treatment options for asthma, COPD and other respiratory and immunology-related diseases.

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Learning Objectives: Asthma/COPD

1. Discuss updated clinical practice guidelines to the assessment and management of patients with asthma and COPD, including the role of exacerbations.
2. Review emerging evidence related to targeted therapies and potential biomarkers to select personalized treatment in asthma and COPD.
3. Review current and emerging therapies for the management of asthma and COPD.

Learning Objectives: COPD

1. Discuss the role of phenotyping in the diagnosis of COPD.

2. Review personalized approaches for COPD treatment based on phenotypes.

3. Describe best practices for managing COPD in the outpatient setting.

Learning Objectives: IPF

1. Review best practices for the healthcare team to effectively educate patients with IPF about their disease, including quality of life issues.
2. Develop a comprehensive approach to the management of IPF based on recent clinical data to include pharmacologic and non-pharmacologic therapies that help improve quality of life in patients with IPF.

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Learning Objectives: Severe Asthma

1. Describe best practices for assessing asthma heterogeneity and severity in patients.
2. Discuss the role of phenotypes and endotypes in the diagnosis and management of asthma.
3. Review current and emerging therapeutics in the treatment of mild, moderate, severe, and difficult to treat asthma.

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Learning Objectives: NTM

1. Describe best practices in the diagnosis of NTM.

2. Discuss an approach to deciding whom to treat.

3. Review current approach to treatment of NTM pulmonary disease.

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Learning Objectives: PAH

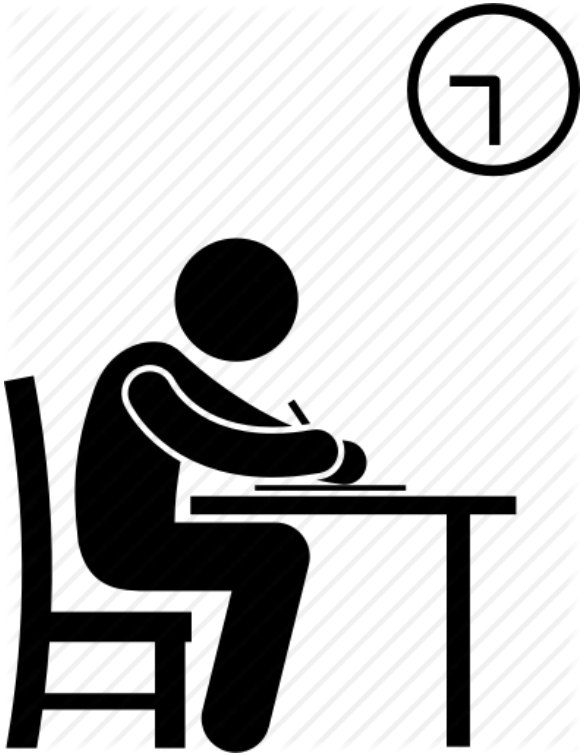
1. Review the classification and epidemiology of pulmonary hypertension, including Pulmonary Arterial Hypertension (PAH) and associated diseases.

2. Discuss current and emerging therapies for the management of pulmonary hypertension.

Outcomes Strategy

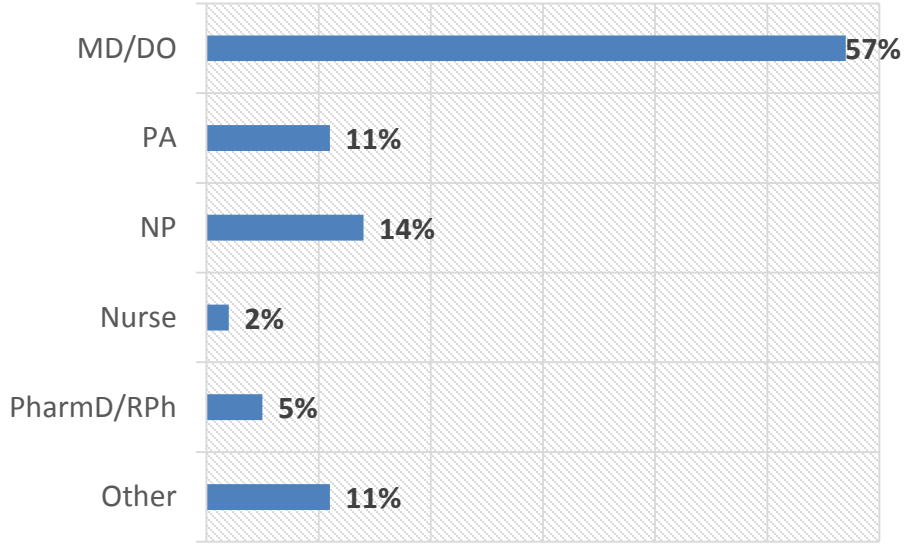
Strategies to measure participants' knowledge and competence:

- ✓ Pre-tests, post-tests
- ✓ ARS questions throughout the activity
- ✓ Evaluations
- ✓ 45-day follow up surveys



Level 1 Outcomes: Participation

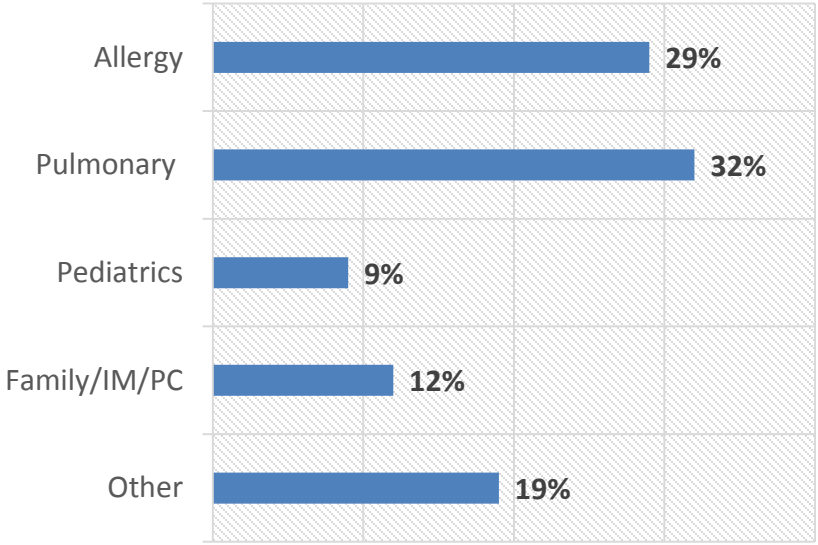
Attendee Designation



Other: BA, BS, PhD, RD

N = 129

Specialty

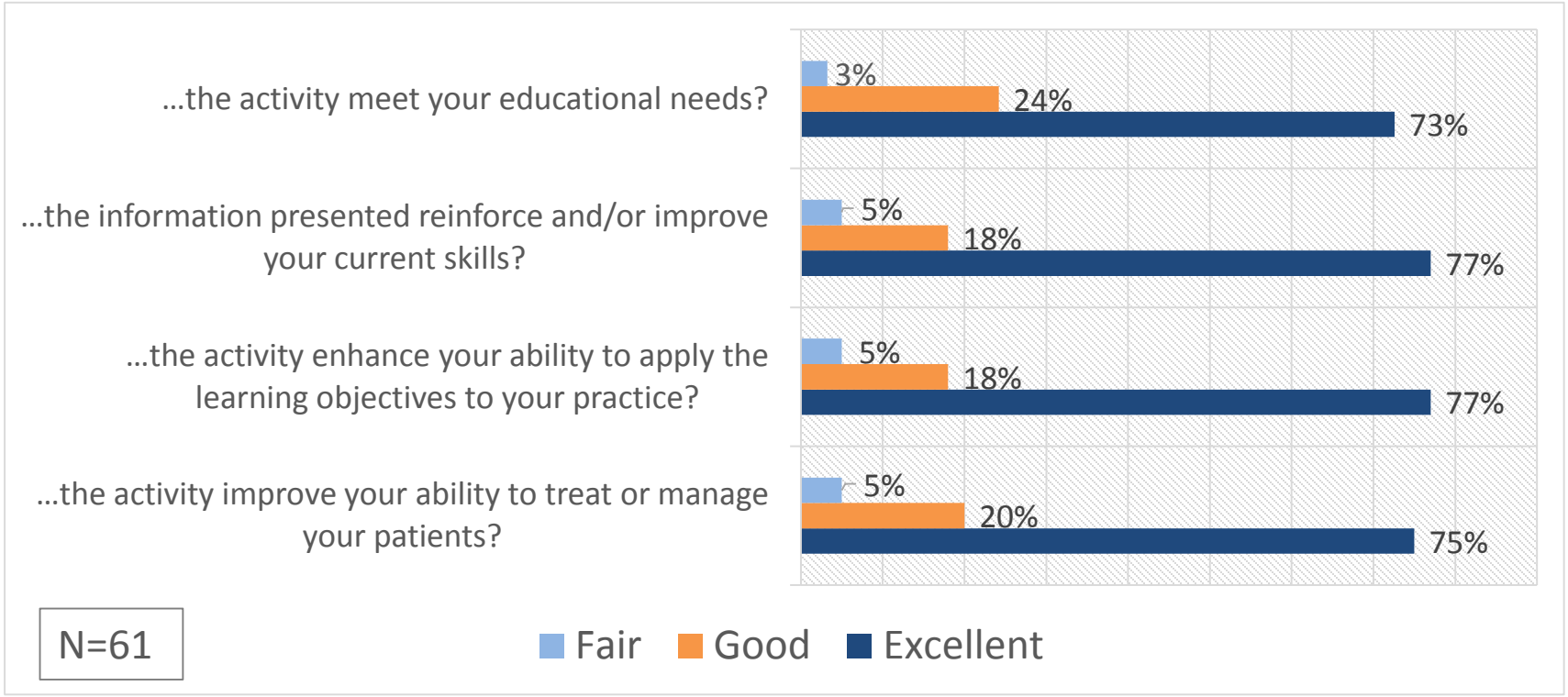


Other: Cardiology, ENT, Immunology, Nutrition, Pathology, Inflammation, Research

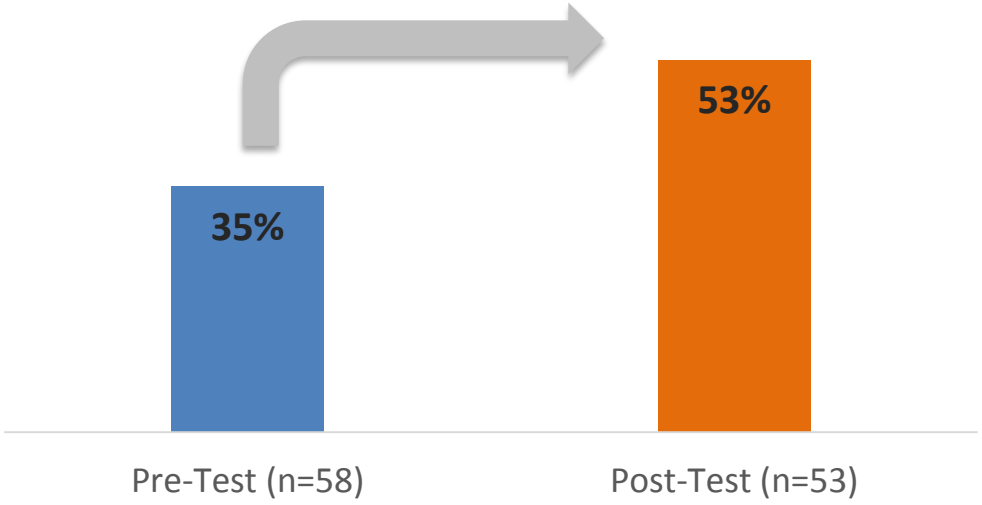
THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Level 2/3 Outcomes: Satisfaction/Learning

Analysis of participants responses related to educational needs



Level 3/4 Outcomes: Learning (Knowledge/Competence)



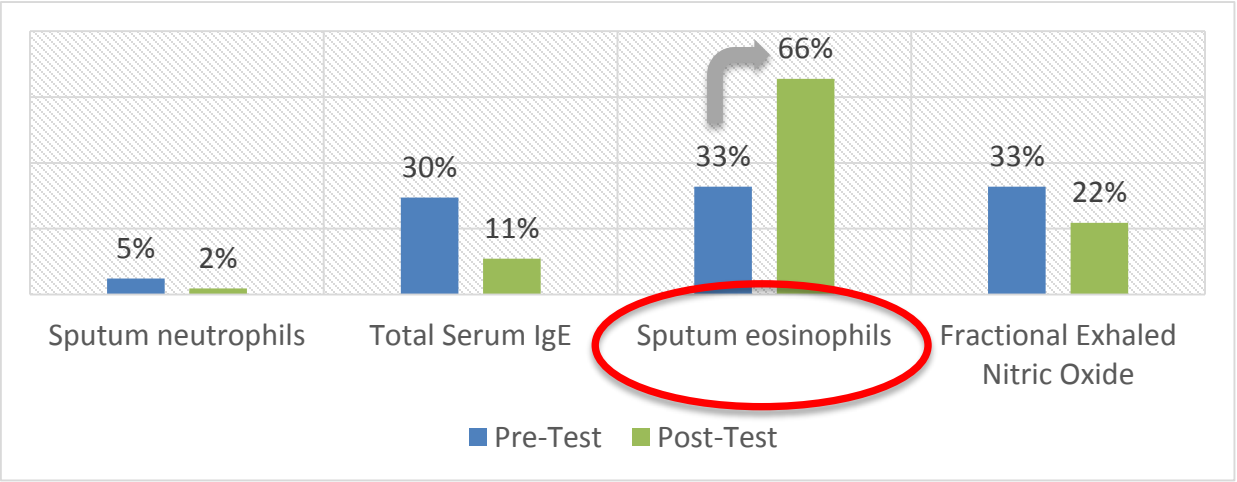
Overall relative knowledge gain from pre- to post-activity

51%

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

Pre/Post Test Comparison: Addresses Severe Asthma Learning Objective #1

In asthma, which clinically available biomarker, when abnormally elevated, has been associated with increased risk of exacerbations?



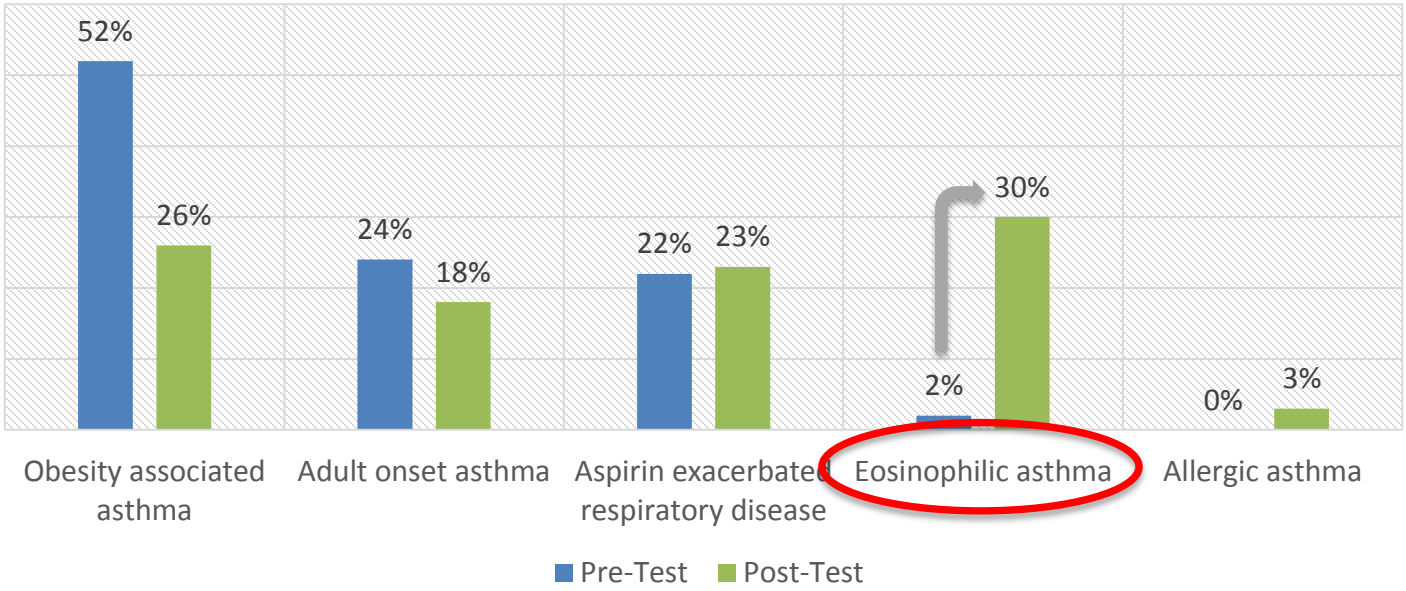
Average relative knowledge gain pre- to post-activity:

99%

Best Answer: C (Sputum eosinophils). *(Jatakanon A, et al. Am J Respir Crit Care Med 2000;161:64–72 Showed that sputum eosinophils correlate with increased exacerbation and loss of asthma control. Exhaled NO levels also correlated with loss of asthma control, but not exacerbations. "Despite their greater baseline number of sputum eosinophils, subjects who developed subsequent exacerbations of asthma showed no increase in baseline exhaled NO levels.")*

Pre/Post Test Comparison: Addresses Severe Asthma Learning Objective #2

Which of the following is not an asthma phenotype?



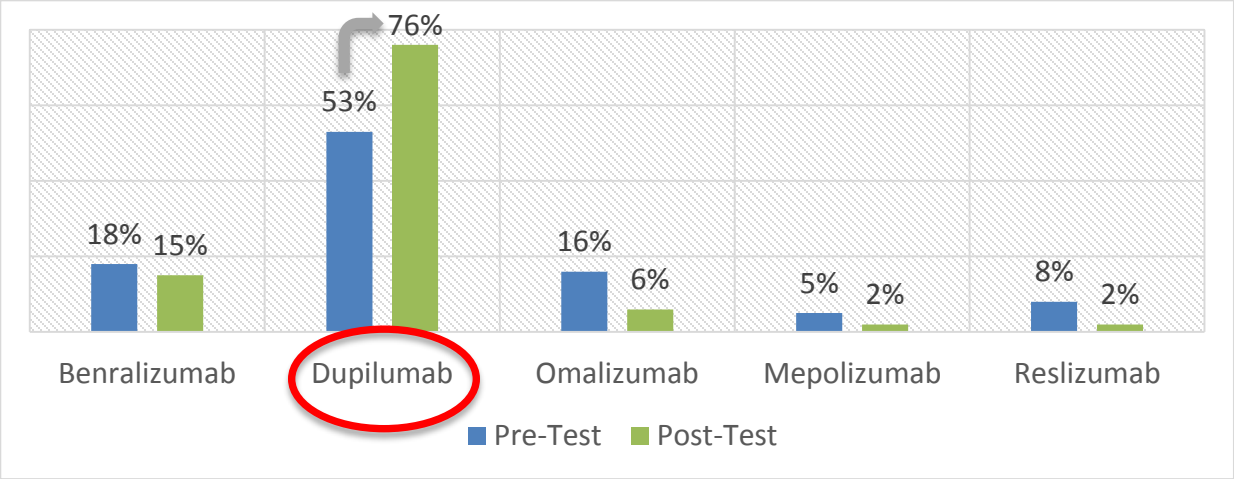
Average relative knowledge gain pre- to post-activity:

1400%

Best Answer: D (Eosinophilic asthma). *This is an asthma endotype. All of the others listed are phenotypes that can be described by the patient whereas eosinophilia is part of an asthma endotype.*

Pre/Post Test Comparison: Addresses Asthma Learning Objective #2 and 3

Which of the following biologic medications became FDA-approved in 2018 for patients with moderate to severe eosinophilic asthma or oral corticosteroid dependent asthma, regardless of phenotype?



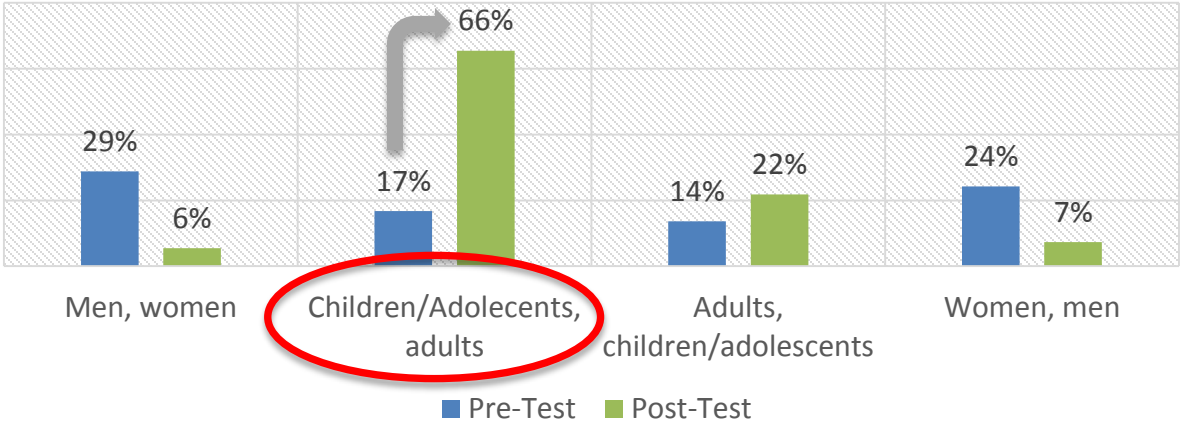
Average relative knowledge gain pre- to post-activity:

46%

Best Answer: B (Dupilumab). *The correct answer is b. Only Dupliumab was approved in 2018 for severe asthma. All the others had been approved prior to 2018. Also Benralizumab, mepolizumab and reslizumab all require an eosinophilic phenotype. Omalizumab requires an elevated IgE level. Dupilumab is indicated for anyone with severe asthma on oral steroids, regardless of phenotype.*

Pre/Post Test Comparison: Addresses Asthma Learning Objective #1

According to GINA 2018 Practice Guideline updates, in _____ FENO-guided treatment was associated with fewer exacerbations than guideline-based treatment; whereas, there was no significant difference in exacerbations with FENO-guided treatment compared with treatment based on current guidelines in _____.



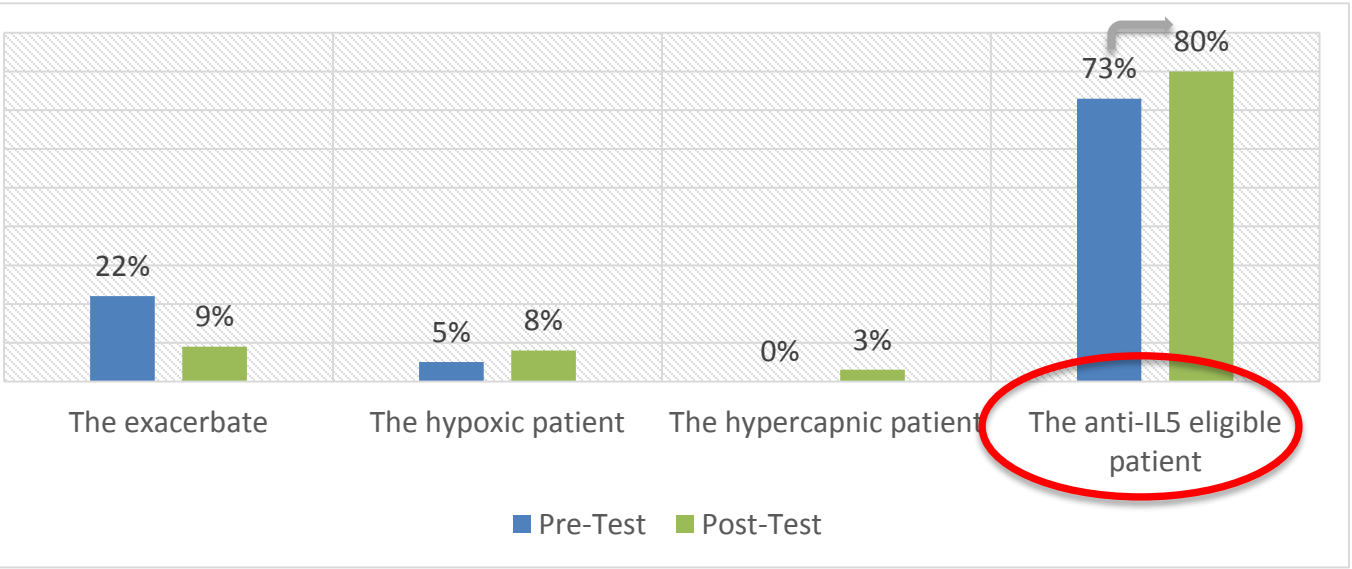
Average relative knowledge gain pre- to post-activity:

101%

Best Answer: C (Sputum eosinophils). *(From GINA 2018 updates (screenshot attached), new data included in a Cochrane Review showed the FENo guided treatment in children reduced exacerbations, but not in adults (particularly severe exacerbations).*

Pre/Post Test Comparison: Addresses COPD Learning Objective #1

Which of the following is not a phenotype in COPD?



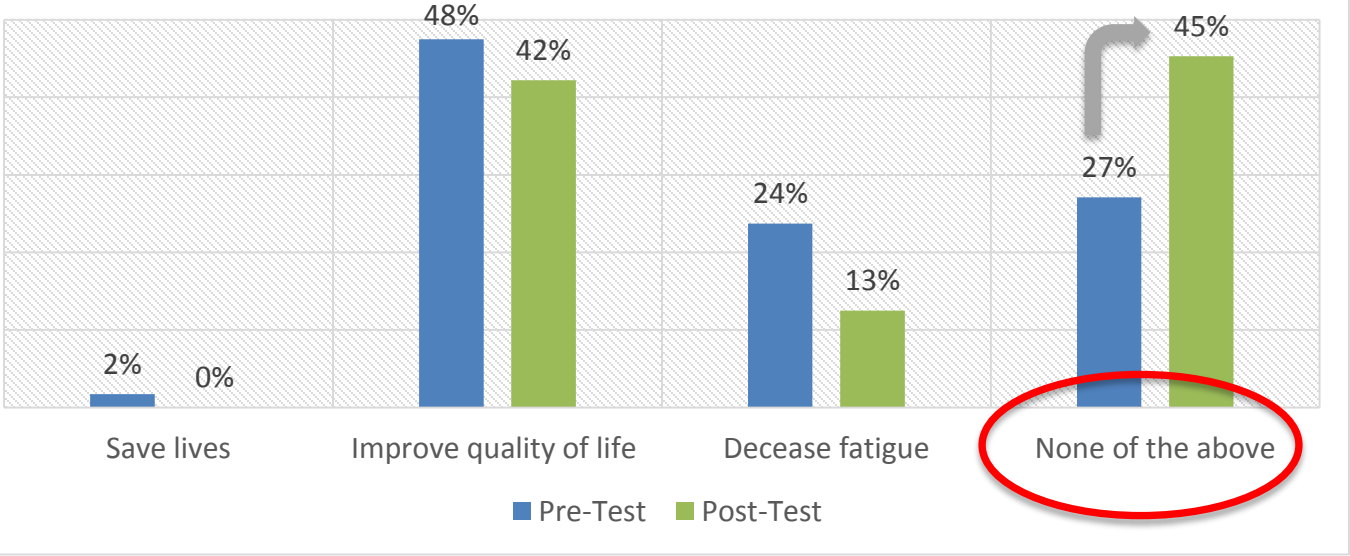
Average relative knowledge gain pre- to post-activity:

10%

Best Answer: D (The anti-IL5 eligible patient). *The correct answer is d. Anti-IL5 therapy is for asthma. This has not been confirmed as a sub group for COPD and we do not use anti-IL5 for COPD.*

Pre/Post Test Comparison: Addresses COPD Learning Objective #2, 3

In patients who have normal resting O2 levels but desaturate with activity, supplemental oxygen has been shown to:



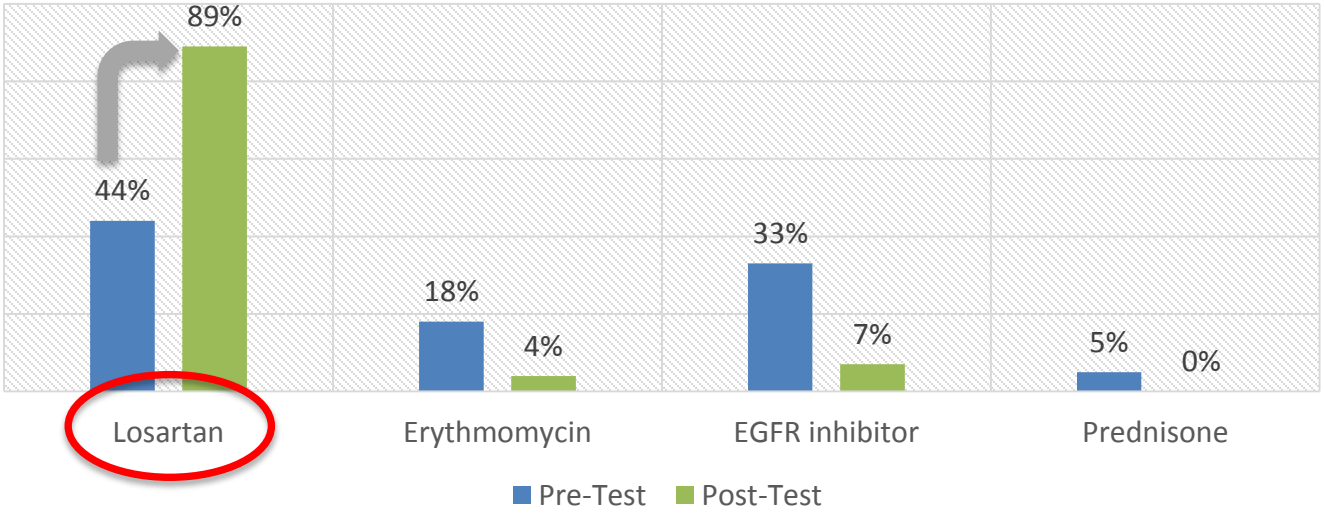
Average relative knowledge gain pre- to post-activity:

67%

Best Answer: D (None of the above). *In stable COPD and moderate resting or exercise induced desaturation: –Definition: Rest 89-93% AND/OR desaturation to 80-90% for 10sec during 6MW –oxygen has no benefit in mortality, hospitalization, health status, lung function or 6-minute walk distance*

Pre/Post Test Comparison: Addresses Asthma/COPD Learning Objective #3

The LEEP study is a study of this drug to decrease progression of COPD.



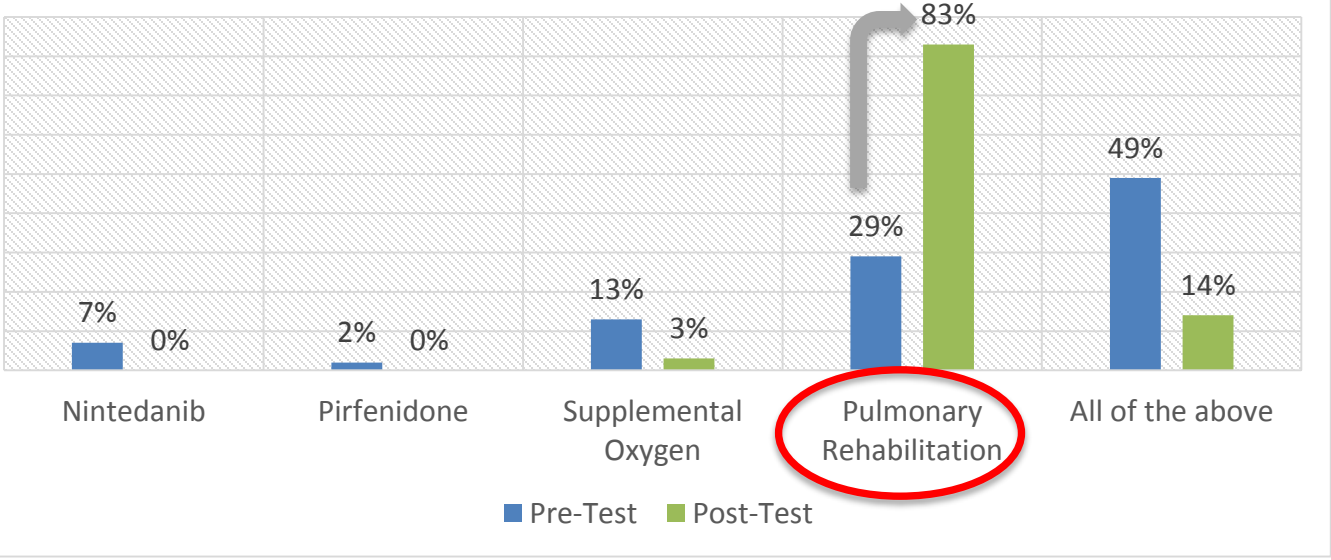
Average relative knowledge gain pre- to post-activity:

293%

Best Answer: A (Losartan). *Evidence suggests that blocking the angiotensin converting enzyme (ACE) might alter COPD progression. In mouse studies, the angiotensin receptor blocker (ARB) Losartan decreased evidence of emphysema in mice exposed to cigarette smoke. In an observational study, use of an ACE inhibitor (ACEI) or ARB was associated with decreased progression of emphysema in patients. The LEEP study is a prospective study of Losartan in CDOP patients in which patients are randomized to Losartant or placebo for 48 weeks. The primary outcome is emphysema progression on CT scan.*

Pre/Post Test Comparison: Addresses IPF Learning Objective #1,2

Which of the following therapies has the greatest impact on overall quality of life for patients with IPF?



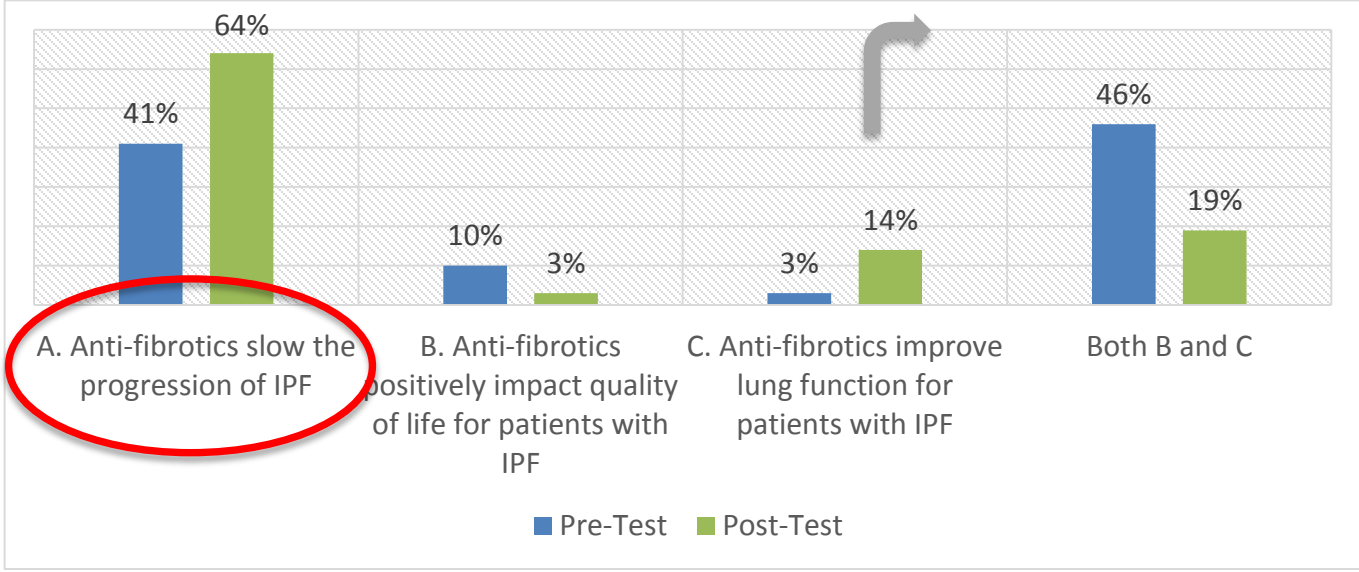
Average relative knowledge gain pre- to post-activity:

186%

Best Answer: Pulmonary Rehabilitation. *The correct answer is Pulmonary Rehabilitation. This is the only intervention with robust data to support QOL benefit*

Pre/Post Test Comparison: Addresses IPF Learning Objective #2

Which of the following is a true statement about anti-fibrotics for patients with Idiopathic Pulmonary Fibrosis (IPF)?



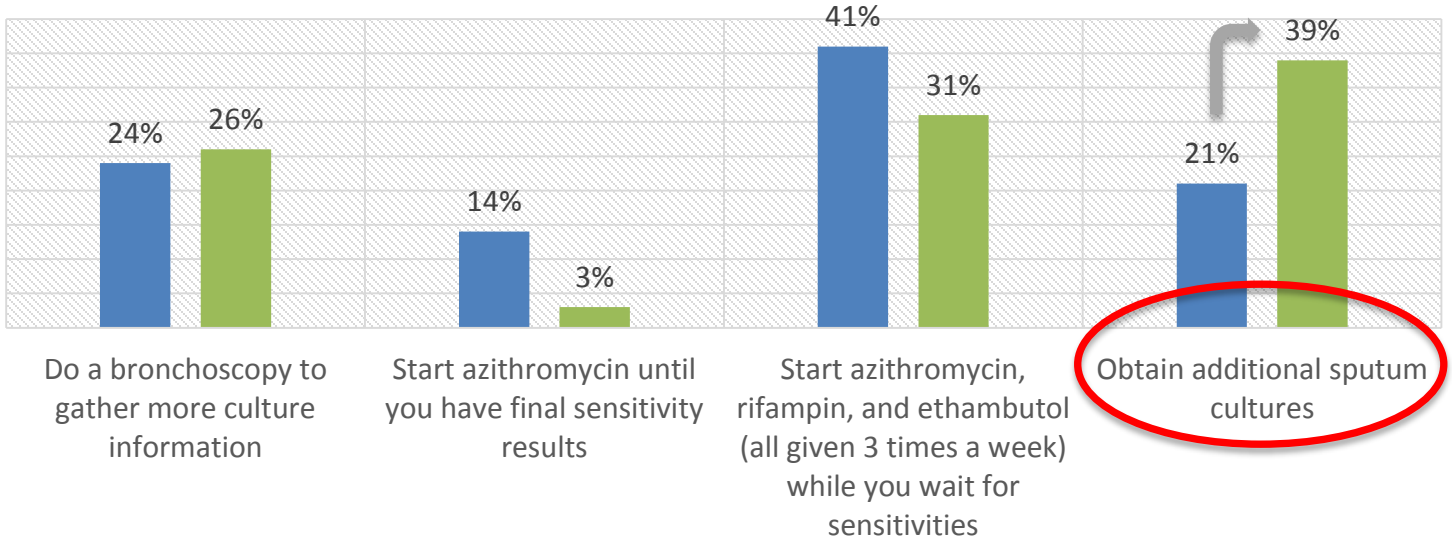
Average relative knowledge gain pre- to post-activity:

57%

Best Answer: A (Anti-fibrotics slow the progression of IPF). *They don't improve lung function or quality of life. Large, phase III trials have shown that anti-fibrotics slow progression of IPF (compared with placebo) as measured by FVC over 52 weeks.*

Pre/Post Test Comparison: Addresses NTM Learning Objective #1

A 70 year old woman with productive cough, fatigue and 5 pound weight loss over the past six months has a chest CT scan that shows mild bronchiectasis and tree-in-bud opacities in the right middle lobe. One of three sputum specimens grows Mycobacterium avium? Which of the following would be best next step?



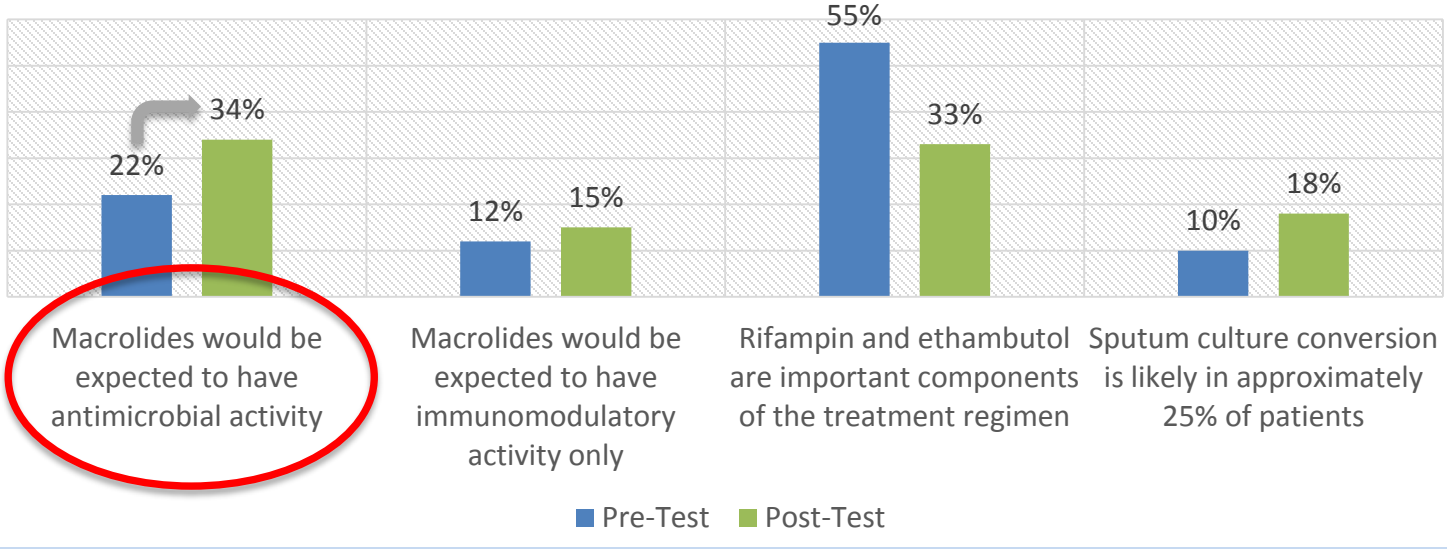
Average relative knowledge gain pre- to post-activity:

86%

Best Answer: D (Obtain additional sputum cultures). *The correct answer is d. Additional sputum cultures are required to determine if the patient meets ATS criteria. A) The patient has a productive cough - We do not recommend bronchoscopies be formed in someone with a productive cough. B) Never start azithromycin alone. C) Patient does not meet ATS criteria for disease so treatment is not indicated.*

Pre/Post Test Comparison: Addresses NTM Learning Objective #3

A 65 year old woman presents with cough and fatigue for the past year. A chest CT shows evidence of right middle lobe and lingular bronchiectasis with scattered tree-in-bud opacities and mucous plugging. Two out of three sputum cultures grow M. abscessus, subspecies massiliense. Which of the following is correct?



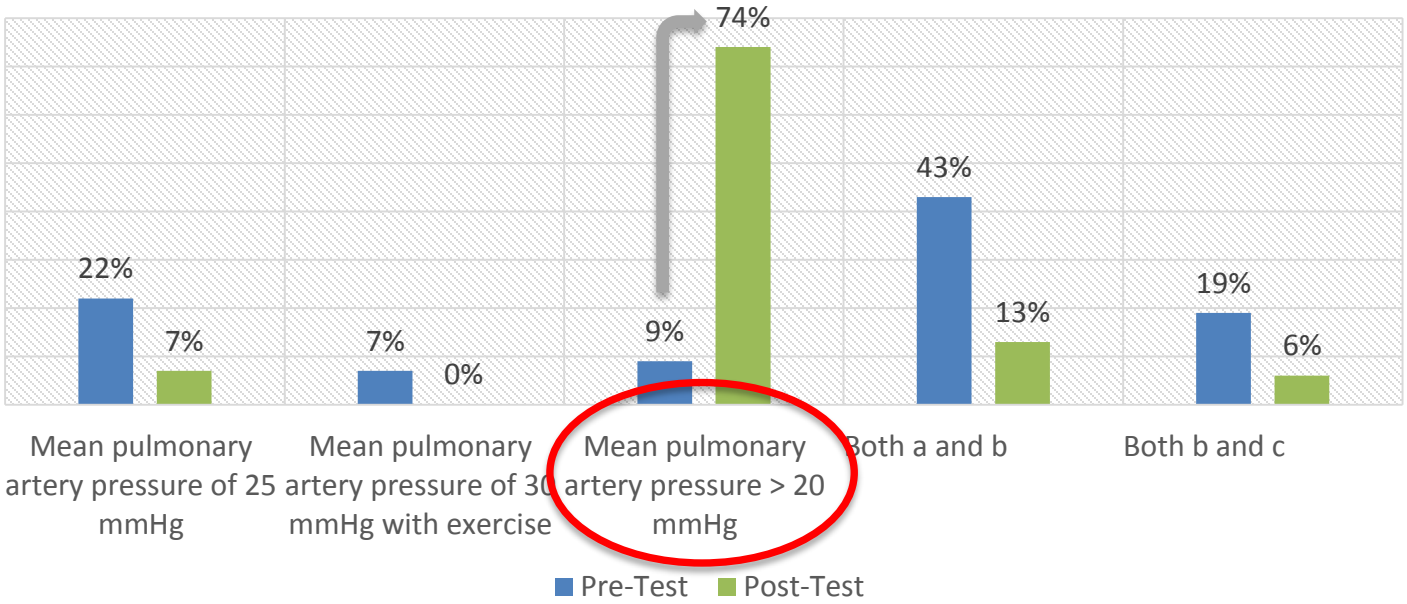
Average relative knowledge gain pre- to post-activity:

54%

Best Answer: A (Macrolides would be expected to have antimicrobial activity). *The patient grew M. abscessus subspecies massiliense which has a nonfunctional erm(41) gene (no inducible resistance). Therefore, the macrolides will be active and should be used (answer a). Answer b is incorrect as this would be the case if the erm gene was functional as in M. abscessus subspecies abscessus. Answer c is incorrect because rifampin and ethambutol have no antimicrobial activity against the organism and d is incorrect as the culture conversion is about 80%.*

Pre/Post Test Comparison: Addresses PAH Learning Objective #1

What is the hemodynamic definition of pulmonary hypertension?



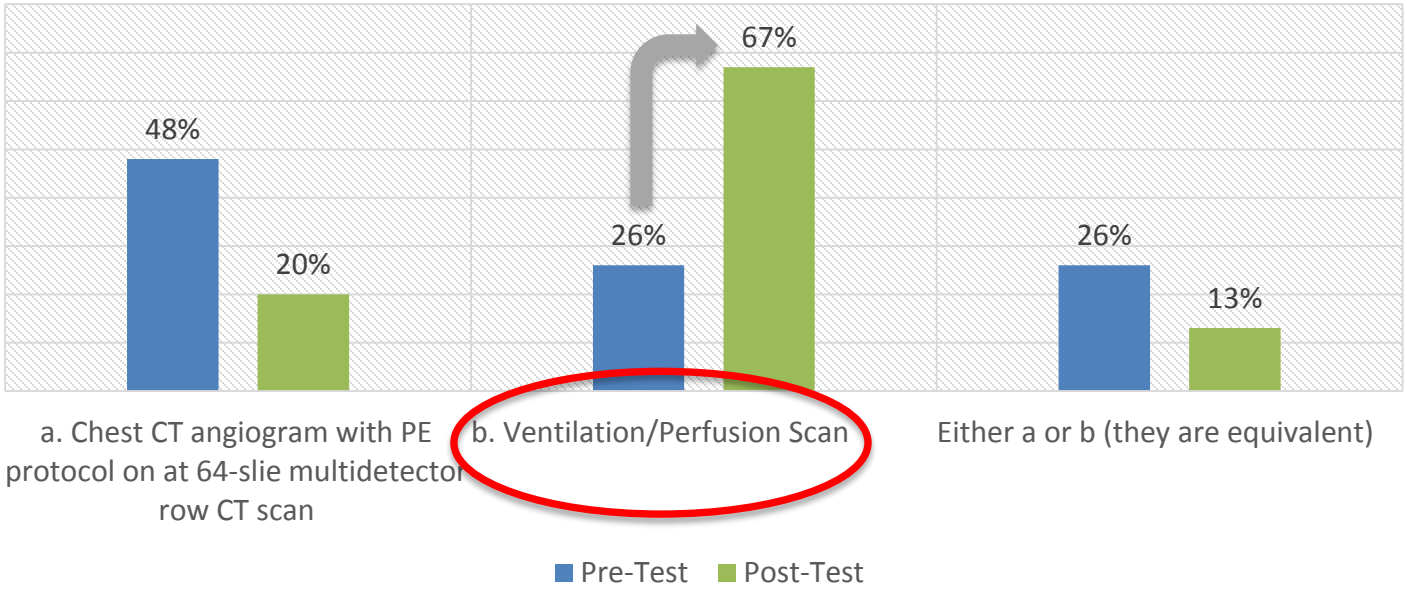
Average relative knowledge gain pre- to post-activity:

722%

Best Answer: ***Mean Pulmonary Artery Pressure > 20 mmHg.*** *The definition of pulmonary hypertension was recently changed at the 6th World Symposium on Pulmonary Hypertension in 2018. The prior definition laid out in the 5th World Symposium defined pulmonary hypertension as a mean pulmonary artery pressure of 25 mmHg or greater. There is currently no definition in the guidelines involving exercise.*

Pre/Post Test Comparison: Addresses PAH Learning Objective #1

The best test to screen for chronic thromboembolic disease is:



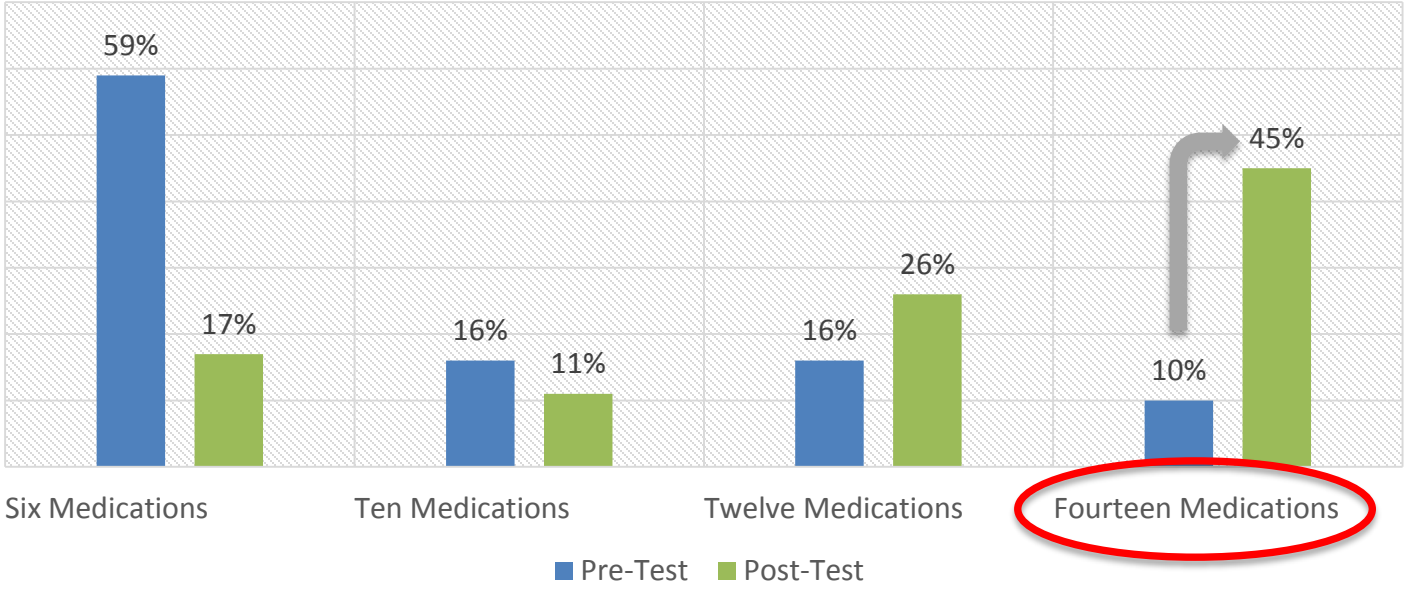
Average relative knowledge gain pre- to post-activity:

158%

Best Answer: b. Ventilation/Perfusion Scan. V/Q scan is significantly more specific for detecting chronic thromboembolic disease especially in the distal pulmonary arteries, as reported by Tunariu and colleagues.

Pre/Post Test Comparison: Addresses PAH Learning Objective #2

There are how many FDA-approved medications for pulmonary arterial hypertension?



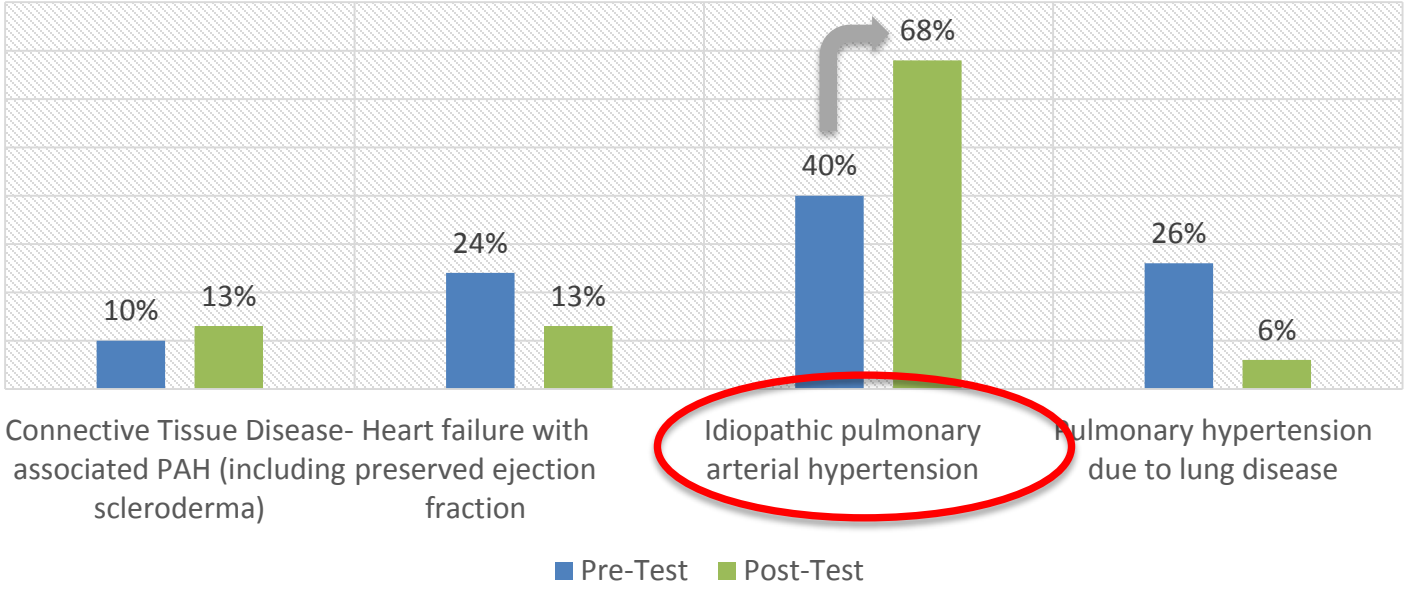
Average relative knowledge gain pre- to post-activity:

350%

Best Answer: Fourteen. There are 14 FDA-approved medications for the treatment of pulmonary arterial hypertension.

Pre/Post Test Comparison: Addresses PAH Learning Objective #1

The most common type of WHO Group 1 pulmonary hypertension is:



Average relative knowledge gain pre- to post-activity:

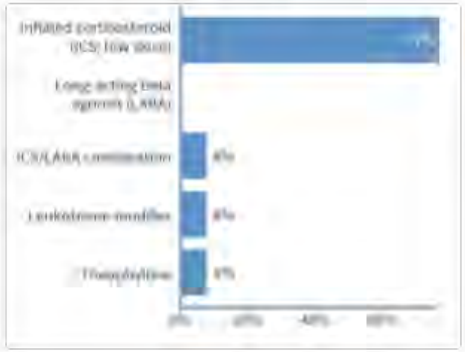
70%

Best Answer: Idiopathic Pulmonary Arterial Hypertension. According to data from the REVEAL cohort, the largest cohort in the United States, idiopathic pulmonary arterial hypertension is the most common form of PAH, followed by connective tissue disease associated pulmonary arterial hypertension.

Automated Response Data: Severe Asthma

Audience Response System (ARS) was implemented strategically throughout the conference to engage participants in the learning process, create an interactive method of learning and responding to questions, and encourage audience participation to elucidate problems and solutions.

What therapy should be started?



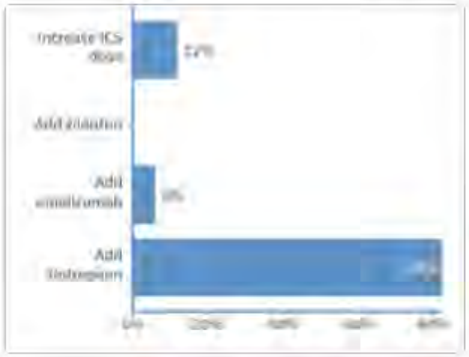
Response options	Count	Percentage
Inhaled corticosteroid (ICS; low dose)	**10**	**77%**
Long-acting beta agonist (LABA)	0	0%
ICS/LABA combination	1	8%
Leukotriene modifier	1	8%
Theophylline	1	8%

**The bolded response indicates the answer that was selected by the most participants.*

Automated Response Data: Severe Asthma

Audience Response System (ARS) was implemented strategically throughout the conference to engage participants in the learning process, create an interactive method of learning and responding to questions, and encourage audience participation to elucidate problems and solutions.

After the workup returns, what would you treat Tony with next?



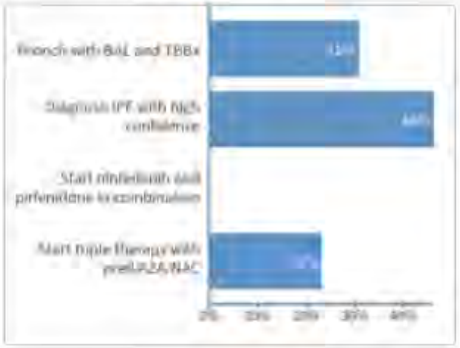
Response options	Count	Percentage
Increase ICS dose	2	12%
Add zileuton	0	0%
Add omalizumab	1	6%
Add tiotropium	**14**	**82%**

**The bolded response indicates the answer that was selected by the most participants.*

Automated Response Data: IPF

Audience Response System (ARS) was implemented strategically throughout the conference to engage participants in the learning process, create an interactive method of learning and responding to questions, and encourage audience participation to elucidate problems and solutions.

What's your next move for Case JO?



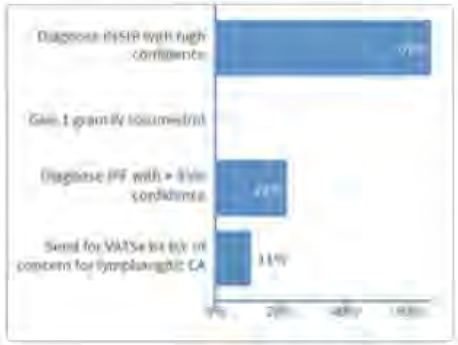
Response options	Count	Percentage
Bronch with BAL and TBBx	4	31%
Diagnose IPF with high confidence	**6**	**46%**
Start nintedanib and pirfenidone in combination	0	0%
Start triple therapy with pred/AZA/NAC	3	23%

**The bolded response indicates the answer that was selected by the most participants.*

Automated Response Data: IPF

Audience Response System (ARS) was implemented strategically throughout the conference to engage participants in the learning process, create an interactive method of learning and responding to questions, and encourage audience participation to elucidate problems and solutions.

What if the history was exactly the same, but his HRCT looked like this?



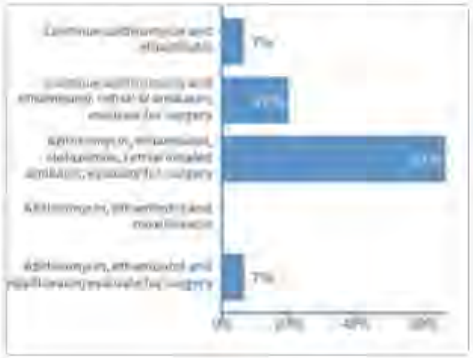
Response options	Count	Percentage
Diagnose iNSIP with high confidence	**6**	**67%**
Give 1 gram IV solumedrol	0	0%
Diagnose IPF with > 95% confidence	2	22%
Send for VATSx bx b/c of concern for lymphangitic CA	1	11%

**The bolded response indicates the answer that was selected by the most participants.*

Automated Response Data: NTM

Audience Response System (ARS) was implemented strategically throughout the conference to engage participants in the learning process, create an interactive method of learning and responding to questions, and encourage audience participation to elucidate problems and solutions.

How would you treat this patient?



Response options	Count	Percentage
Continue azithromycin and ethambutol	1	7%
Continue azithromycin and ethambutol; retrial IV amikacin; evaluate for surgery	3	20%
Azithromycin, ethambutol, clofazimine; retrial inhaled amikacin; evaluate for surgery	**10**	**67%**
Azithromycin, ethambutol and moxifloxacin	0	0%
Azithromycin, ethambutol and moxifloxacin; evaluate for surgery	1	7%

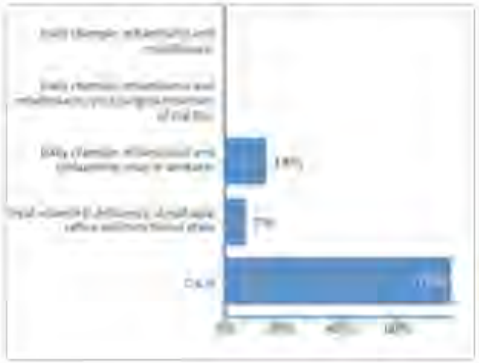
**The bolded response indicates the answer that was selected by the most participants.*

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Automated Response Data: NTM

Audience Response System (ARS) was implemented strategically throughout the conference to engage participants in the learning process, create an interactive method of learning and responding to questions, and encourage audience participation to elucidate problems and solutions.

How would you manage this patient?



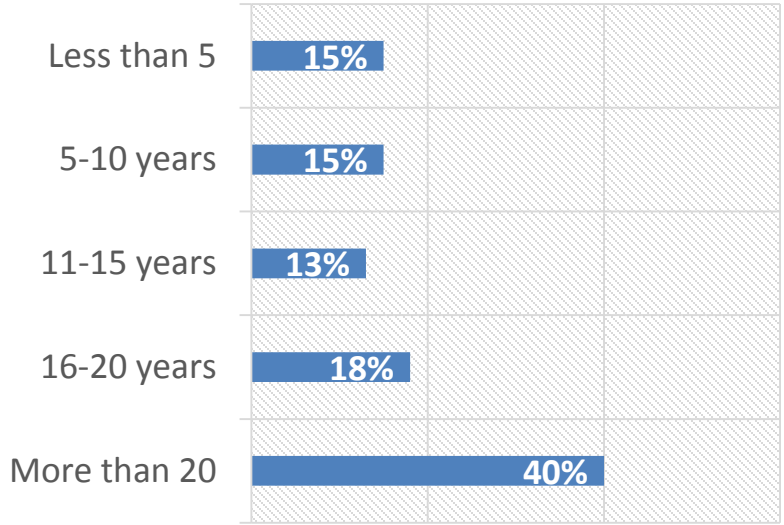
Response options	Count	Percentage
Daily rifampin, ethambutol and moxifloxacin	0	0%
Daily rifampin, ethambutol and moxifloxacin, plus surgical resection of the RUL	0	0%
Daily rifampin, ethambutol and clofazimine, plus IV amikacin	2	14%
Treat vitamin D deficiency, dysphagia, reflux and nutritional state	1	7%
C & D	**11**	**79%**

**The bolded response indicates the answer that was selected by the most participants.*

Level 4 Outcomes: Competence

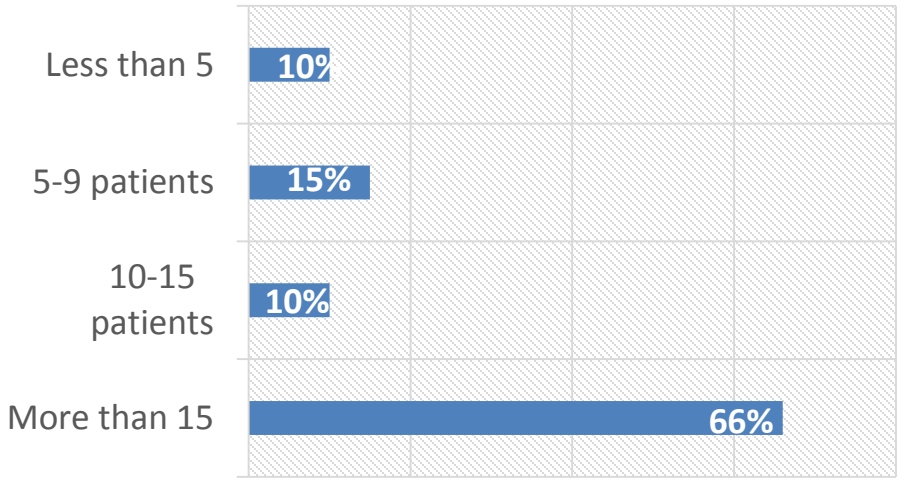
N=62

Learners' Average Years in practice



Average number of years in practice: **15**

Average # of patients learner treats per week with conditions discussed in this activity

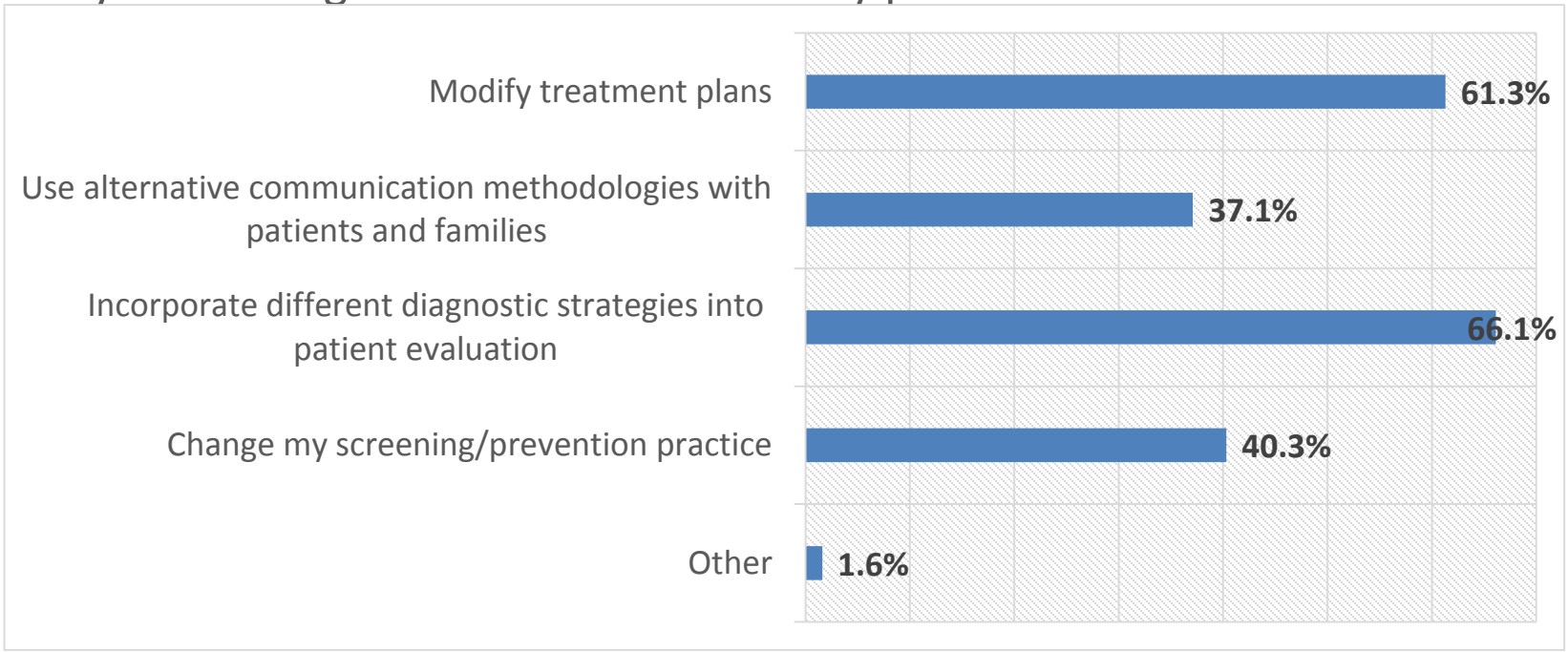


Estimated number of patients impacted per month: **3200+**

Level 4 Outcomes: Competence

N=62

97% of respondents report they **intend to make changes to practice** as a result of the activity. The changes **I intend to make** in my practice include:



*Other: Not in practice

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Evaluation Results

N=62

- **100%** of respondents report the content was **evidence based and clinically relevant**
- **97%** of respondents report they **intend to make changes to practice** as a result of the activity
- **94%** of respondents report the activity **addressed strategies for overcoming barriers** to optimal patient care
- **95%** of respondents report that the information presented **reinforced and/or improved their current skills**
- **95%** of respondents report that the educational activity **improved their ability to treat or manage patients**

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Overall Activity Impact

N=48

Based on the educational content delivered at the *Pulmonary and Allergy Update*, participants demonstrated a **51% increase in knowledge and competence**. Additionally, participants report that they have **changed their screening and prevention practices (38%),** have **incorporated different diagnostic strategies into patient evaluation (60%),** have **modified treatment plans** (**53%**) and are **using alternative communication** methods (**38%**) with their pulmonary, allergy, and immunology patients as a result of the activity.

The *Pulmonary and Allergy Update* fulfills National Quality Strategy Priorities in making care safer for patients with asthma, COPD and other pulmonary and allergy conditions, as well as promoting the most effective treatment and prevention practices for these disease states.

THE 41st ANNUAL NATIONAL JEWISH HEALTH PULMONARY AND ALLERGY UPDATE

Accreditation

National Jewish Health is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians and by the California Board of Registered Nursing to provide nursing contact hours for nurses.

National Jewish Health designated this live activity for a maximum of 14.75 *AMA PRA Category 1 Credits™* and a maximum of 15 nursing contact hours.

About NJH

✓ The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) ranks National Jewish Health in the top 1 percent of hospitals in the nation.

✓ National Jewish Health has been ranked by U.S. News & World Report as the #1 Respiratory Hospital for 15 years.

✓ U.S. News & World Report rated National Jewish Health COPD (chronic obstructive pulmonary disease) care and Lung Cancer Surgery program as “high performing,” the highest rating available.

✓ National Jewish Health Physicians are part of Castle Connolly’s “America’s Top Doctors” List, as well as 5280 magazine’s “Top Docs” 2016 rankings of Denver-area physicians.

✓ National Jewish Health is in the top 8 percent of institutions in the country funded by the National Institutes of Health.

✓ National Jewish Health has the largest pulmonary division in the nation and is the only hospital whose principal focus is pulmonary disease.