



Emerging Challenges in Primary Care 2018
17th Annual Regional and Online CME Conference Series

Navigating the Maze of Interstitial Lung Disease: Improving Outcomes through Early Diagnosis



Final Live Activities Outcomes Report

Supporter: Boehringer Ingelheim • Grant ID: ME201822872

January 11, 2019

Executive Summary

- ❖ This curriculum focused on the management of interstitial lung disease (ILD), with a specific focus on diagnosing and treating idiopathic pulmonary fibrosis (IPF).
- ❖ Substantial improvements were measured in learners' understanding of the diagnosis of IPF and of available therapies.



2,577*
Total Attendees



6 Cities

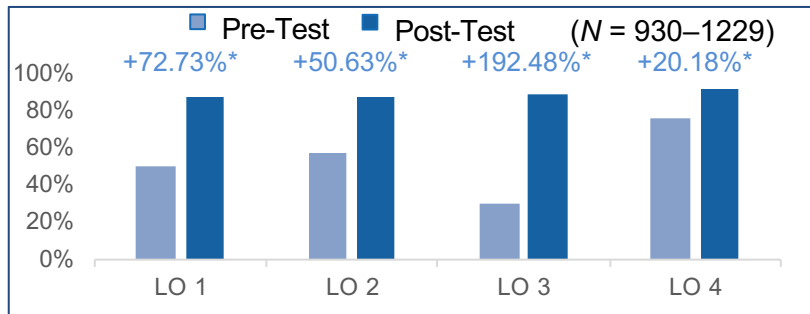


1,315*
On Site



1,262*
Simulcast / Virtual Symposium

Pre to Post-Test Results By Learning Objective



- ❖ **73% Improvement:** Recognize the importance of early identification of patients with potential idiopathic pulmonary fibrosis (IPF)
- ❖ **51% Improvement:** Utilize appropriate strategies to diagnose a patient with IPF while excluding other potential mimickers
- ❖ **192% Improvement:** Discuss the available therapeutic options for patients with IPF
- ❖ **20% Improvement:** Recognize the role of the primary care clinician in managing the multi-morbidities associated with IPF

Impact

- ❖ 2,577 attendees were reached via both online and live formats, with significant gains observed across cohorts and modalities from Pre-Test to Post-Test.
- ❖ Despite substantial improvements and high Post-Test scores, the low PCA scores in the Knowledge domain suggest that learners remain challenged on the features of IPF and on the selection of treatments that reduce the rate of change in FVC.
- ❖ Higher scores were measured on Competence items that addressed learners' selection of specific diagnostic tools and the selection of therapy for managing comorbidities.

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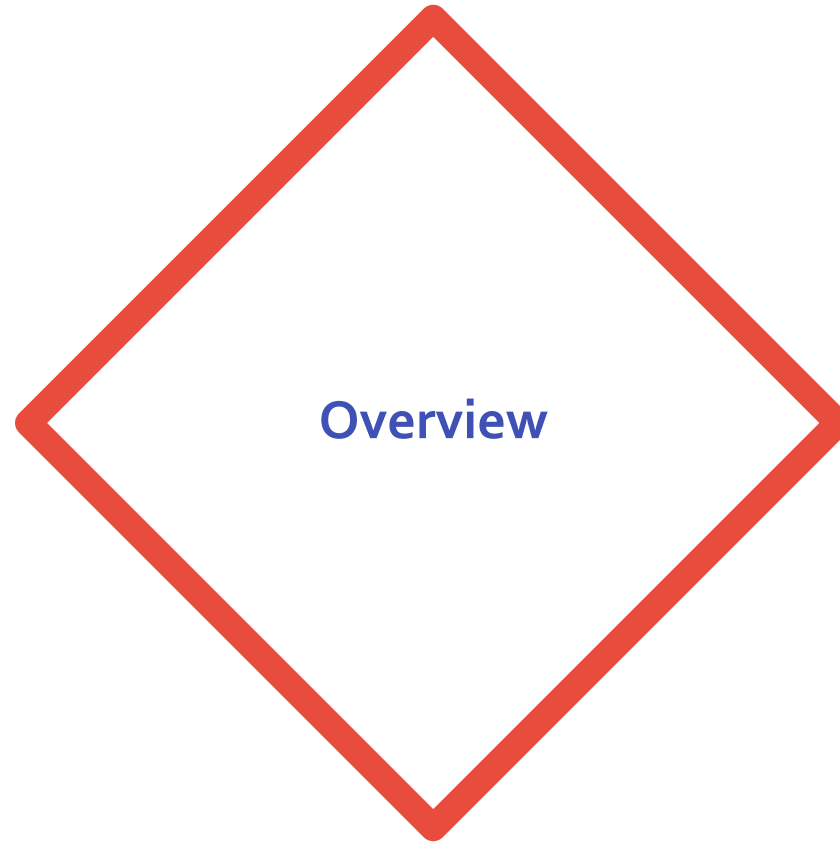


Emerging Challenges in Primary Care 2018 17th Annual Regional and Online CME Conference Series

Commercial Support

The Emerging Challenges in Primary Care: 2018 series of CME activities were supported through educational grants or donations from the following companies:

- ❖ Actelion Pharmaceuticals US, Inc.
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Pharmaceuticals
- ❖ Sanofi US





Emerging Challenges in Primary Care 2018

17th Annual Regional and Online CME Conference Series

6 Accredited Live Regional Symposia with 2 national simulcasts: Aug 18, 2018 – Oct 13, 2018



1 Accredited Live Virtual Symposium: September 22, 2018



Online Interactive Enduring CME Activity :

- ❖ Launch Date: October 8, 2018, 2018
- ❖ End Date: October 7 2019, 2019
- ❖ Hosted at http://naceonline.com/CME-Courses/course_info.php?course_id=1046

Title	: Navigating the Maze of Interstitial Lung Disease: Improving Outcomes through Early Diagnosis
Activity/Course #:	: NCME360
Cost:	: Free
Release/Start Date:	: Oct 08 2018
Expiration Date:	: Oct 07 2019
Topics:	: Pulmonology
Target Audience:	: Primary Care Physicians, Nurse Practitioners and Physician Assistants
Format:	: Webcast

[FREE CME Register Now](#)



Clinical Highlights eMonograph

eMonograph containing key teaching points from the CME Activity was distributed 1 week after the meeting to all attendees.

Learning Objectives

- ❖ Recognize the importance of early identification of patients with potential idiopathic pulmonary fibrosis (IPF)
- ❖ Utilize appropriate strategies to diagnose a patient with IPF while excluding other potential mimickers
- ❖ Discuss the available therapeutic options for patients with IPF
- ❖ Recognize the role of the primary care clinician in managing the multi-morbidities associated with IPF

Outcomes Methodology

Learning outcomes were measured using matched Pre-Test and Post-Test scores for Knowledge, Competence, Confidence, and practice strategy and across all of the curriculum's Learning Objectives.

Outcomes Metric	Definition	Application
Percentage change	This is how the score changes resulting from the education are measured. The change is analyzed as a relative percentage difference by taking into account the magnitude of the Pre-Test average.	Differences between Pre-Test, Post-Test, and PCA score averages
P value (p)	This is the measure of the statistical significance of a difference in scores. It is calculated using dependent or independent samples t-tests to assess the difference between scores, taking into account sample size and score dispersion. Differences are considered significant for when $p \leq .05$.	Significance of differences between Pre-Test, Post-Test, and PCA scores and among cohorts
Effect size (d)	This is a measure of the strength/magnitude of the change in scores (irrespective of sample size). It is calculated using Cohen's d formula, with the most common ranges of d from 0-1: $d < .2$ is a small effect, $d = .2-.8$ is a medium effect, and $d > .8$ is a large effect.	Differences between Pre-Test and Post-Test score averages
Power	This is the probability (from 0 to 1) that the "null hypothesis" (no change) will be appropriately rejected. It is the probability of detecting a difference (not seeing a false negative) when there is an effect that is dependent on the significance (p), effect size (d), and sample size (N).	Differences between Pre-Test and Post-Test score averages
Percentage non-overlap	This is the percentage of data points at the end of an intervention that surpass the highest scores prior to the intervention. In this report, it will reflect the percentage of learners at Post-Test who exceed the highest Pre-Test scores.	Differences between Pre-Test and Post-Test score averages

Participation

2018 Meeting/Simulcast	Date	Attendees
Houston, TX	8/18/18	245
Troy, MI	8/25/18	220
Troy, MI Simulcast	8/25/18	306
Ft. Lauderdale, FL	9/8/18	308
Nashville, TN	9/15/18	162
Virtual Symposium	9/22/18	601
Uniondale, NY	10/6/18	286
Uniondale, NY Simulcast	10/6/18	355
San Mateo, CA	10/13/18	94
Total		2,577

Level 1
Participation
Demographics
Patient Reach

Participation



2,577*
Total Attendees



6 Cities



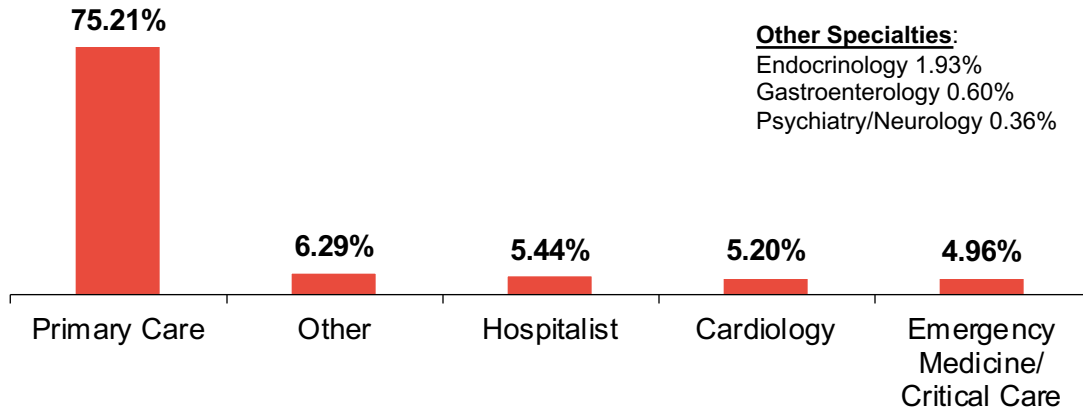
1,315*
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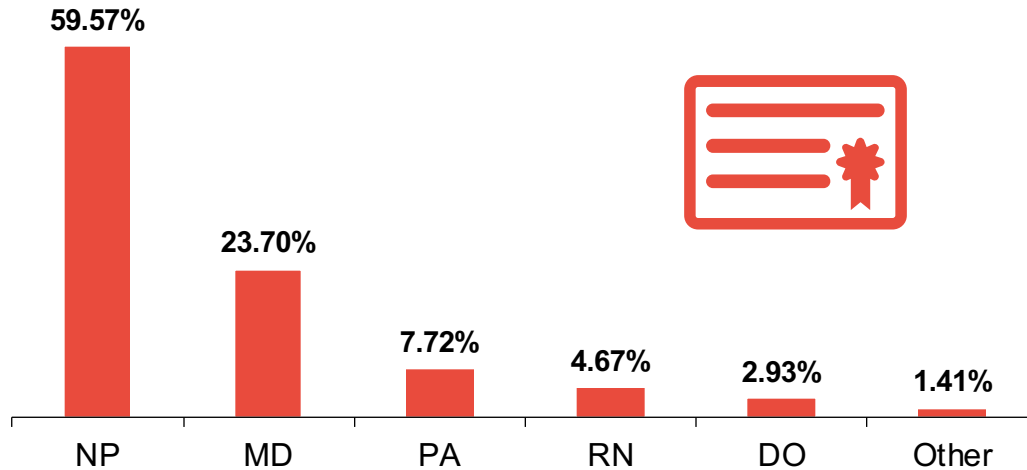
Level 1: Demographics and Patient Reach

Specialty

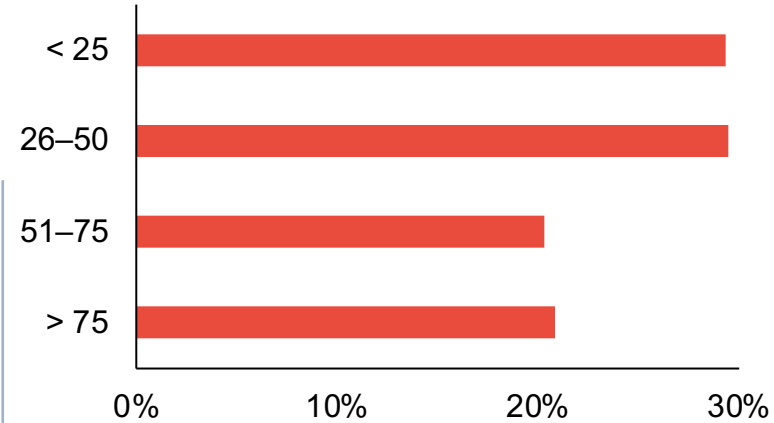


Patient Care Focus: 93%

Profession

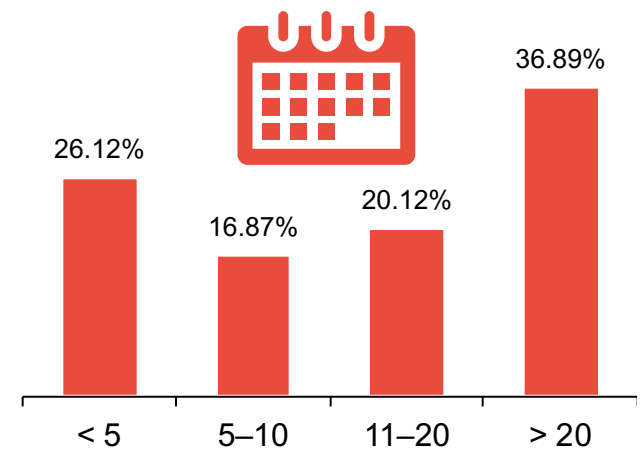


Patients seen each week, in any clinical setting:



Average number of patients seen each week: 46

Years in Practice

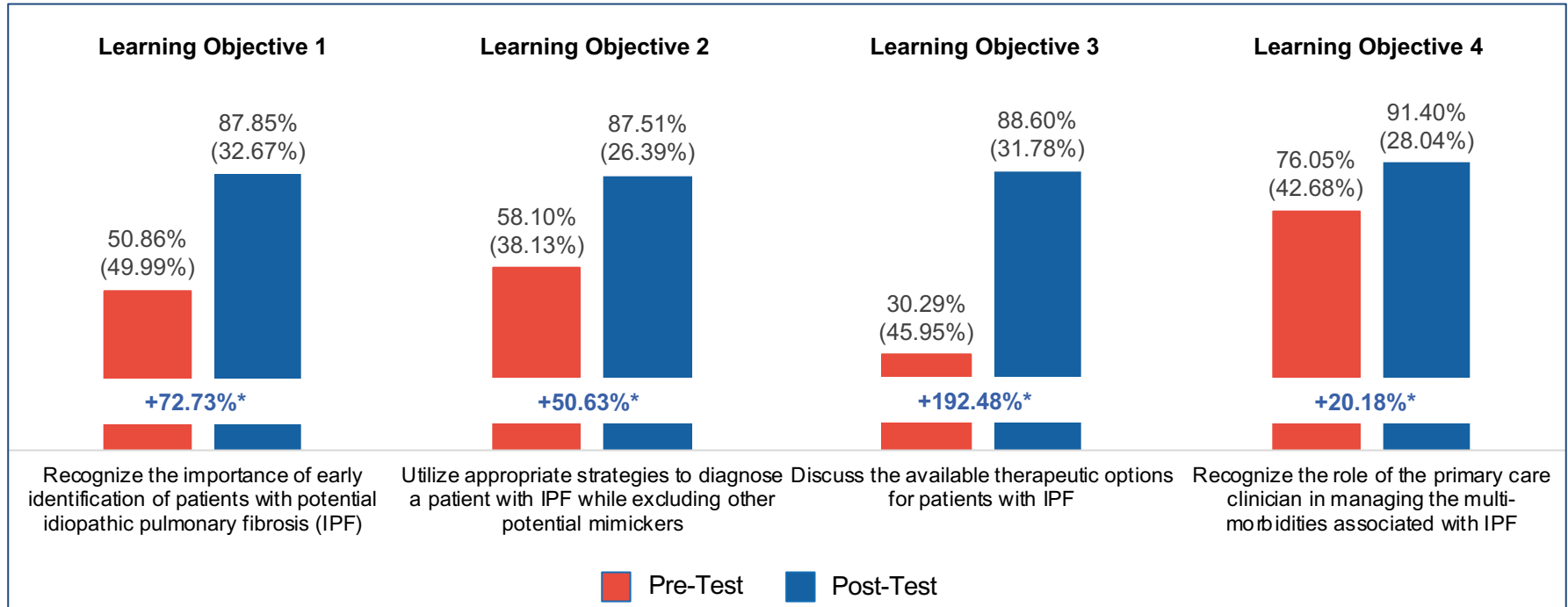




Level 2-5:
Outcomes Metrics

Learning Objectives Analysis

(N = 930–1229)

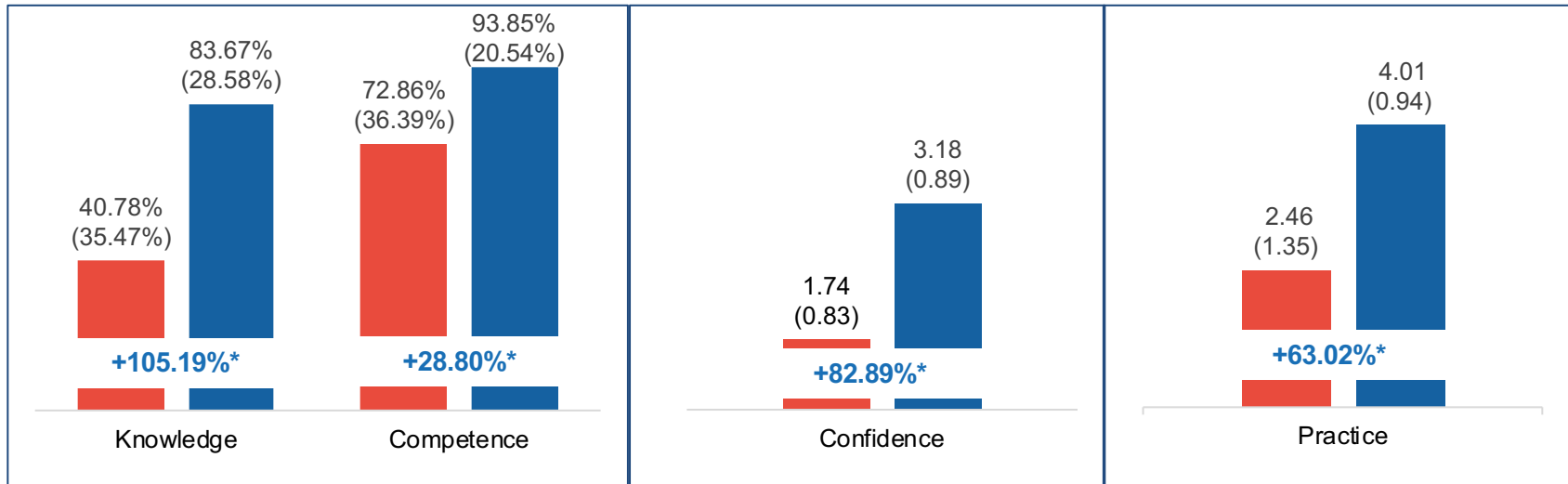


**significant at the $p \leq 0.05$ level*

- ❖ Substantial and significant gains (ranging from 20% to 192%) were achieved on all Learning Objectives.
- ❖ The substantial gains resulted in high Post-Test averages (above 87%) on all Learning Objectives, despite low Pre-Test scores (30%-58%) on three of the four Learning Objectives.
 - Learners accomplished the largest score increase (192%) on the Learning Objective related to therapeutic options for IPF patients, achieving a high Post-Test average (89%) from a low Pre-Test average of 30%.
 - The Learning Objective related to the role of primary care clinicians showed a comparatively high Pre-Test score (76%); the 20% improvement resulted in the highest Post-Test score (91%).

Learning Domain Analysis

(N = 880–1283)



■ Pre-Test ■ Post-Test

**significant at the $p \leq 0.05$ level*

- ❖ Significant gains (29%–105%) were achieved in all learning domains.
- ❖ The substantial 105% increase in Knowledge was due to strong score increases across all three Knowledge questions.
 - The largest of these score increases was a 188% increase on a question related to therapies that reduce the rate of change in FVC in patients with IPF.
- ❖ The 29% gain in Competence was due to increased proficiency on diagnostic tools and treatments for patient presentations of lung disease.
- ❖ Learners also demonstrated a substantial increase in reported Confidence in their ability to recognize features consistent with idiopathic pulmonary fibrosis, from a very low Pre-Test rating of 1.7 to a moderate Post-Test rating of 3.2.

Curriculum/Activity Intervention Effect

Learning Domain	Effect Size*	% Non-Overlap
Knowledge	1.331	69.81%
Competence	0.710	47.25%

Effect Size Definition: This is a standardized measure of the strength/magnitude of the change in scores, irrespective of sample size. This metric quantifies the association between outcome and exposure to education, in a way which makes meta-analysis possible. There exist many types of effect size measures, each appropriate in different situations. We select Cohen's d for this analysis, which is a standardized difference in mean. Most commonly, d ranges from 0–1: $d < 0.2$ is a small effect, $d = 0.2–0.8$ is a medium effect, and $d > 0.8$ is a large effect.

Learning Domain by Professional Cohort

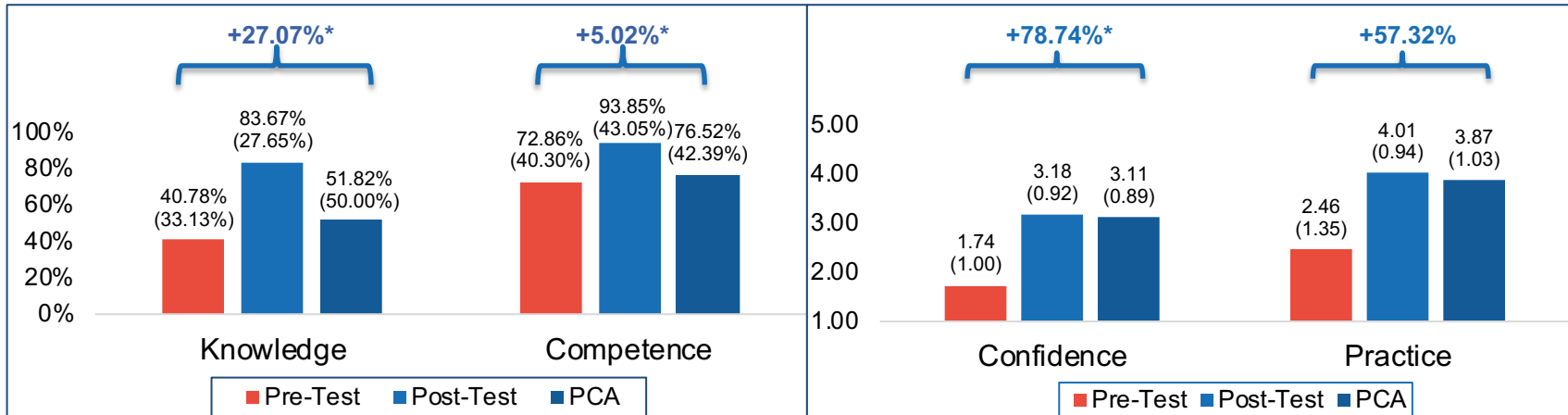
Learning Domain	Nurse Practitioner				Physician			
	N	Pre-Test	Post-Test	% Change	N	Pre-Test	Post-Test	% Change
Knowledge	301	37.71% (33.83%)	80.84% (29.64%)	+114.39%*	149	43.18% (33.78%)	87.92% (22.75%)	+103.63%*
Competence	295	75.08% (34.17%)	94.07% (20.35%)	+25.28%*	143	75.87% (33.37%)	95.10% (18.05%)	+25.35%*
Confidence	244	1.58 (0.74)	2.97 (0.89)	+87.82%*	125	1.94 (0.86)	3.25 (0.85)	+67.77%*
Practice	209	2.19 (1.17)	3.81 (1.03)	+73.80%*	115	2.53 (1.28)	4.02 (0.85)	+58.76%*

**significant at the $p \leq 0.05$ level*

- ❖ Nurse practitioners (NPs) and physicians demonstrated statistically significant gains in all learning domains.
- ❖ In Knowledge, Confidence, and practice strategy, NPs demonstrated greater score increases from lower Pre-Test scores compared to physicians. The Post-Test scores of NPs remained lower in these domains; however, score differences were minimized.
 - NPs and physicians demonstrated comparable Pre- and Post-Test scores and gains in the Competence domain.

4-Week Retention Analysis

(N = 653)



**significant at the $p \leq 0.05$ level; unmatched data*

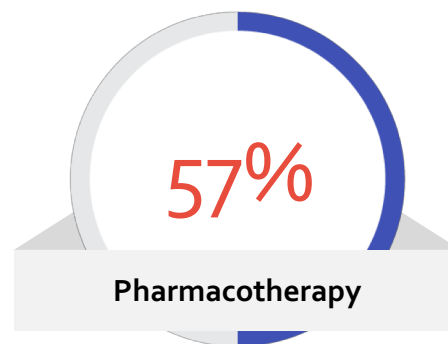
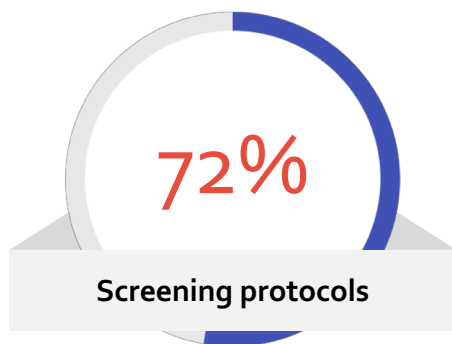
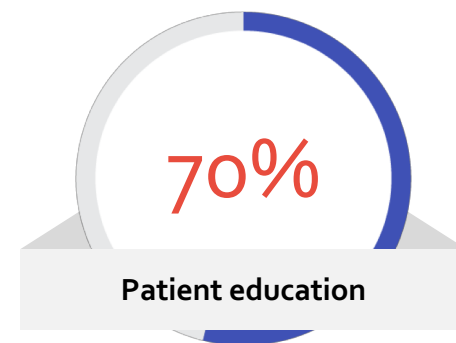
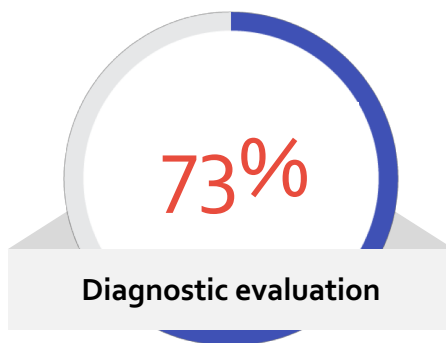
At follow-up:

- ❖ Statistically significant net gains were measured from Pre-Test to the Post Curriculum Assessment (PCA) in all areas.
- ❖ Score slippage from Post-Test to the PCA was also noted in all areas.
- ❖ Although a significant net gain was measured in Knowledge, the score slippage that was observed in this domain resulted in a low PCA score of 50%, reinforcing the need for continued education on the management of ILD.
- ❖ Similar score slippage measured in Competence returned scores to slightly above their Pre-Test level, further indicating a need for reinforcement.

(4-week Post Assessment)

Please select the specific areas of *skills, or practice behaviors*, you have improved regarding the evaluation of patients for ILD since this CME activity. (Select all that apply.)

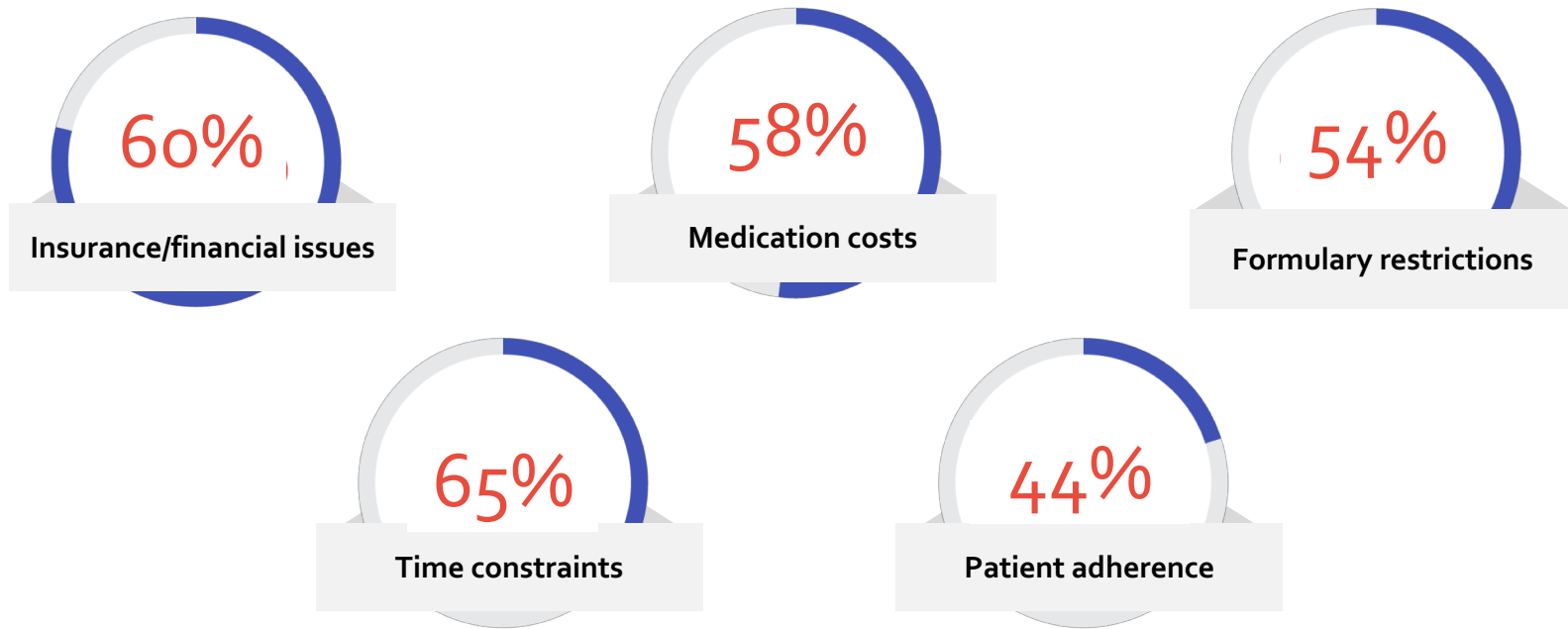
N=653



(4-week Post Assessment)

What specific *barriers* have you encountered that may have prevented you from successfully implementing strategies for the evaluation of patients for ILD and its management since this CME activity? (Select all that apply)

N=653



Identified Learning Gaps:

Although Post-Test scores were uniformly high across all Knowledge and Competence items, substantial slippage occurred from Post-Test to the PCA in the Knowledge domain. The PCA was therefore analyzed to identify persistent learning gaps for this population, and demonstrated low scores on all Knowledge items, suggesting persistent clinical gaps on the recognition and diagnosis of IPF and the impact of treatments on the rate of change in FVC.

Diagnosis and recognition of IPF

On average, about how much time passes between the onset of symptoms of IPF and an accurate diagnosis of IPF?

Results:

- In the PCA, only 56% of learners correctly answered: **“1-2 years.”**

Which of the following features may suggest the need to evaluate a patient for interstitial lung disease?

Results:

- At PCA, only 44% of learners correctly answered: **“exertional desaturation.”**

Treatments for IPF that reduce the rate of change in FVC

Which of the following therapies has been shown to reduce the rate of change in FVC in patients with IPF, without increasing risk for mortality?

Results:

- In the PCA, only 56% of learners correctly answered: **“Nintedanib or pirfenidone.”**

Overall Educational Impact

- ❖ Significant improvements (ranging from 29% – 105%) were seen across all learning domains.
 - The cohort analysis of professions showed that physicians demonstrated higher Post-Test scores than NPs in Knowledge, Confidence, and practice strategy. NPs showed greater gains in these domains from lower Pre-Test scores, which lessened some of the Post-Test score differences.
 - In Competence, similar scores and increases were measured.
 - Live onsite learners demonstrated higher Post-Test averages than online participants in all learning domains, despite lower Pre-Test scores by live onsite learners in Knowledge, Competence, and practice strategy.
 - Analysis of learning retention in the PCA showed that significant net gains from Pre-Test were measured in all learning domains (5% – 79%). The greatest net increase was measured in learners' reported Confidence in recognizing IPF (1.74 at Pre-Test to 3.11 in the PCA), in part due to minimal score slippage from Post-Test to the PCA.
- ❖ Significant improvements (ranging from 20% – 192%) were measured across all Learning Objectives; high Post-Test scores were measured on all four Learning Objectives (88% – 91%).
 - Onsite learners achieved higher Post-Test averages and greater score increases than online learners on all Learning Objectives.
- ❖ Although Post-Test averages were consistently high for all Knowledge and Competence items, the score slippage that occurred from Post-Test to the PCA in the Knowledge domain suggests **persistent clinical gaps on the diagnosis of IPF and its treatment.**
 - Low PCA scores were measured on two Knowledge items that addressed the timing after the onset of symptoms in which an accurate diagnosis of IPF is made, in addition to the features (such as exertional desaturation) that would necessitate further evaluation.
 - The low PCA score on a third Knowledge item that asked about therapies that can reduce the rate of change in FVC without impacting mortality suggests an additional clinical gap on the treatment of IPF.



Appendix

Learning Objectives Analysis – Live Onsite vs. Live Online Audience

- “Live onsite learners” include only those attending in-person meetings.
- “Live online learners” include those from both the Simulcast and Virtual Symposium.

Learning Objective	Live Onsite Learners				Live Online Learners			
	N	Pre-Test	Post-Test	% Change	N	Pre-Test	Post-Test	% Change
Recognize the importance of early identification of patients with potential idiopathic pulmonary fibrosis (IPF)	617	50.24% (50.00%)	89.47% (30.70%)	+78.06%*	313	52.08% (49.96%)	84.66% (36.03%)	+62.58%*
Utilize appropriate strategies to diagnose a patient with IPF while excluding other potential mimickers	856	58.35% (37.48%)	90.13% (23.03%)	+54.45%*	373	57.51% (39.57%)	81.50% (32.02%)	+41.72%*
Discuss the available therapeutic options for patients with IPF	719	28.51% (45.15%)	91.66% (27.66%)	+221.46%*	334	34.13% (47.42%)	82.04% (38.39%)	+140.35%*
Recognize the role of the primary care clinician in managing the multi-morbidities associated with IPF	676	72.63% (44.58%)	92.01% (27.11%)	+26.68%*	347	82.71% (37.82%)	90.20% (29.73%)	+9.06%*

**significant at the $p \leq 0.05$ level*

- ❖ Onsite learners demonstrated both higher Post-Test averages and greater score increases on all Learning Objectives.

Learning Domain Analysis – Live Onsite vs. Live Online Audience

- “Live onsite learners” include only those attending in-person meetings.
- “Live online learners” include those from both the Simulcast and Virtual Symposium.

Learning Domain	Live Onsite Learners				Live Online Learners			
	N	Pre-Test	Post-Test	% Change	N	Pre-Test	Post-Test	% Change
Knowledge	883	40.34% (35.41%)	86.58% (26.08%)	+114.65%*	400	41.75% (35.59%)	77.25% (32.54%)	+85.03%*
Competence	846	70.33% (37.51%)	95.04% (18.49%)	+35.13%*	405	78.15% (33.30%)	91.36% (24.08%)	+16.90%*
Confidence	620	1.77 (0.86)	3.26 (0.91)	+84.57%*	320	1.69 (0.75)	3.03 (0.83)	+79.48%*
Practice	574	2.42 (1.28)	4.02 (0.98)	+66.55%*	306	2.55 (1.27)	3.99 (0.88)	+56.74%*

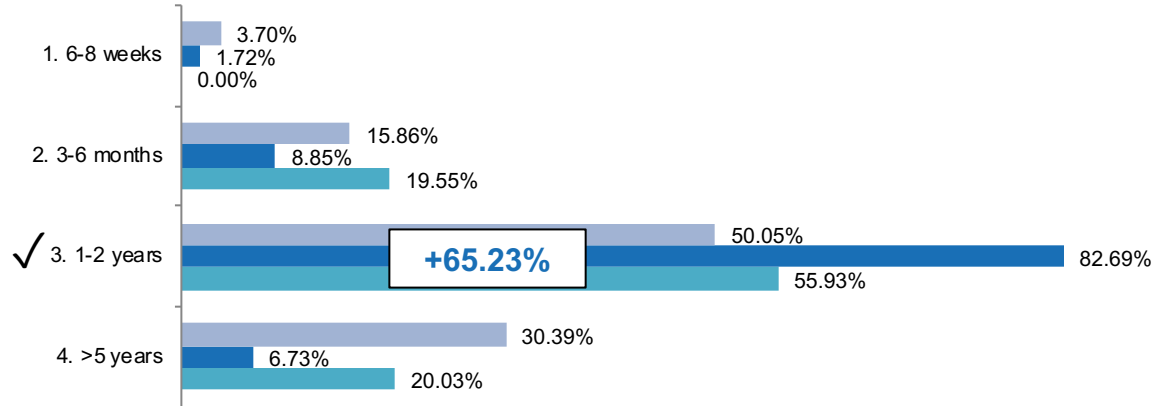
**significant at the $p \leq 0.05$ level*

- ❖ Live onsite learners demonstrated higher Post-Test scores than live online learners in all domains.
- ❖ Live onsite learners had lower Pre-Test scores than live online learners in all domains except Confidence. The greater gains of live onsite learners resulted in Post-Test scores that exceeded those of live online learners.

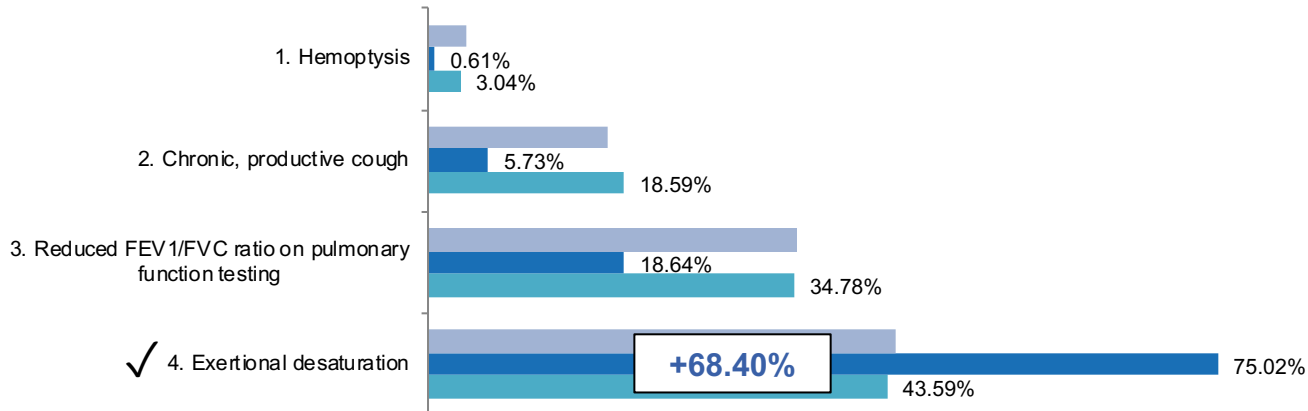
Knowledge Questions:

N = 1053–1309, main activity, N = 624, PCA

On average, about how much time passes between the onset of symptoms of IPF and an accurate diagnosis of IPF?



Which of the following features may suggest the need to evaluate a patient for interstitial lung disease?

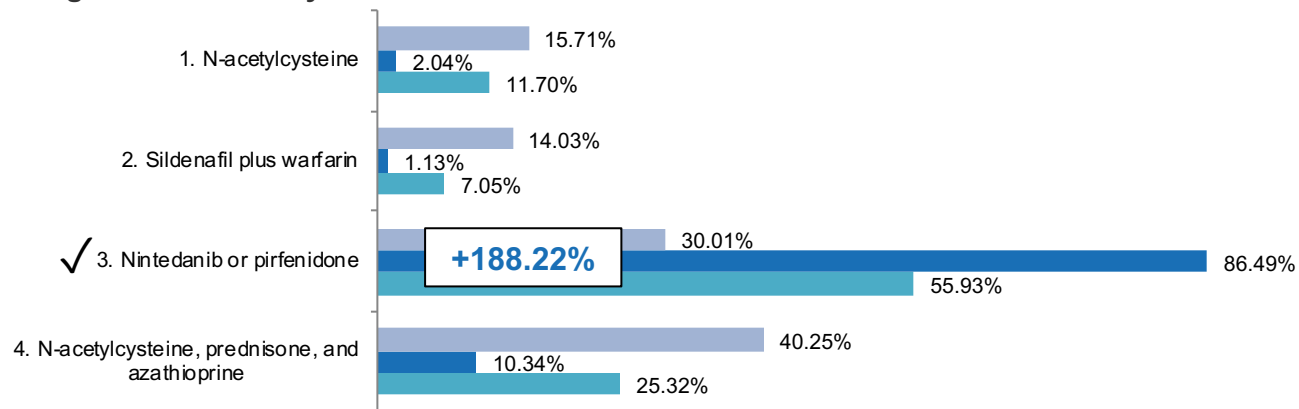


Pre-Test Post-Test PCA

Note: Data is unmatched. Percent changes are from Pre-Test to Post-Test.

Knowledge Questions, continued: N = 1133–1325, main activity, N = 624, PCA

Which of the following therapies has been shown to reduce the rate of change in FVC in patients with IPF, without increasing risk for mortality?



■ Pre-Test ■ Post-Test ■ PCA

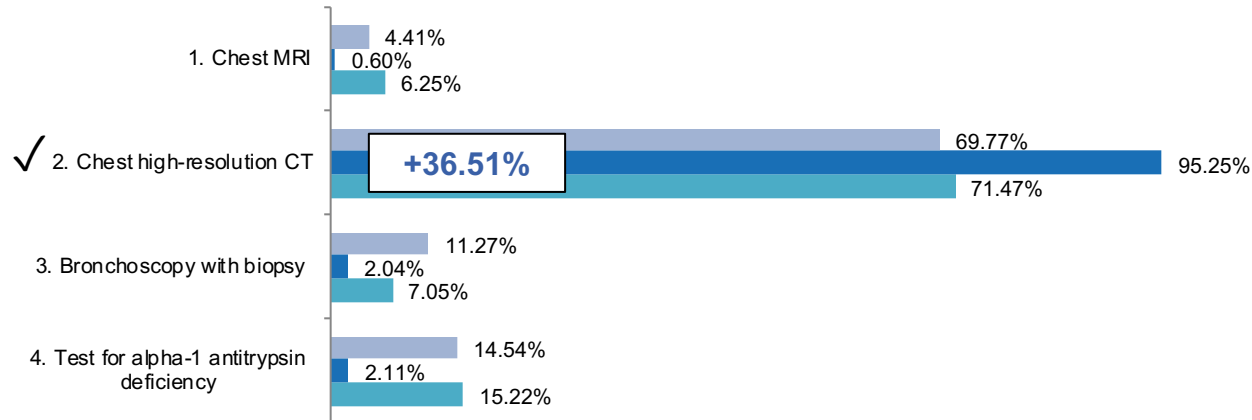
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Competence Questions

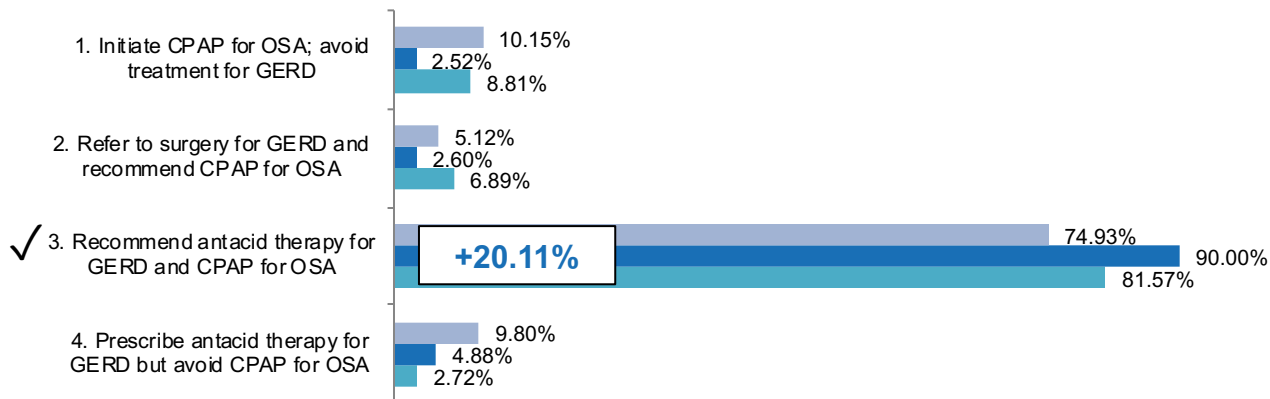
N = 1133–1325, main activity, N = 624, PCA

A 63-year-old man presents with a 6-month history of progressive dyspnea and cough. He is a former smoker (15 pack-years, quit 20 years ago). Workup identifies: PFTs: DLCO 48%, otherwise WNL. O2 sat: 98% at rest on RA. 90% while walking 50 meters, Bilateral crackles in lower lung fields. Chest x-ray: no infiltrates or masses.

Which of the following might be appropriate at this time?



A 68-year-old overweight woman with a history of IPF and gastroesophageal reflux disease (GERD) presents complaining of daytime fatigue and poor sleep quality. Workup identifies obstructive sleep apnea (OSA). Which of the following might be an appropriate approach to managing her comorbidities?



Pre-Test Post-Test PCA

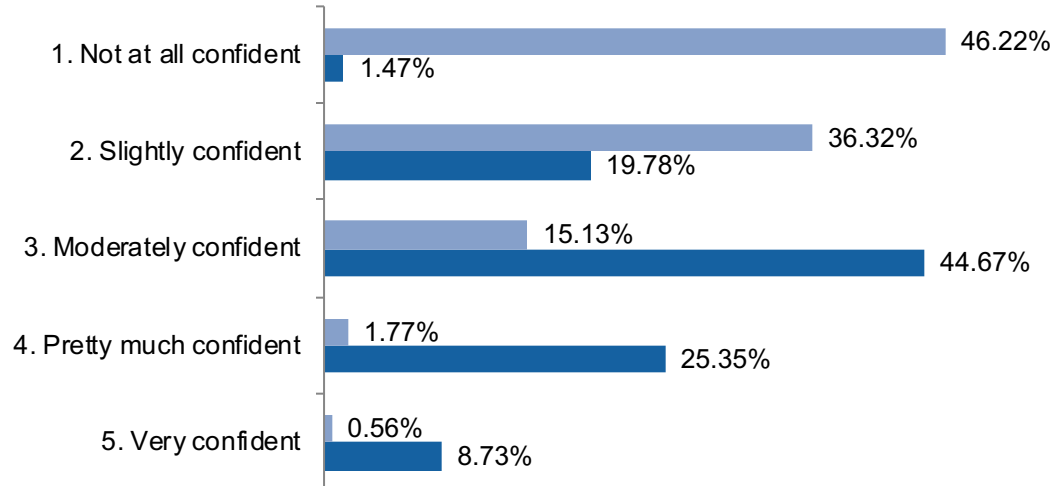
Note: Data is unmatched. Percent changes are from Pre-Test to Post-Test.

Confidence & Practice Questions

N = (1059–1294)

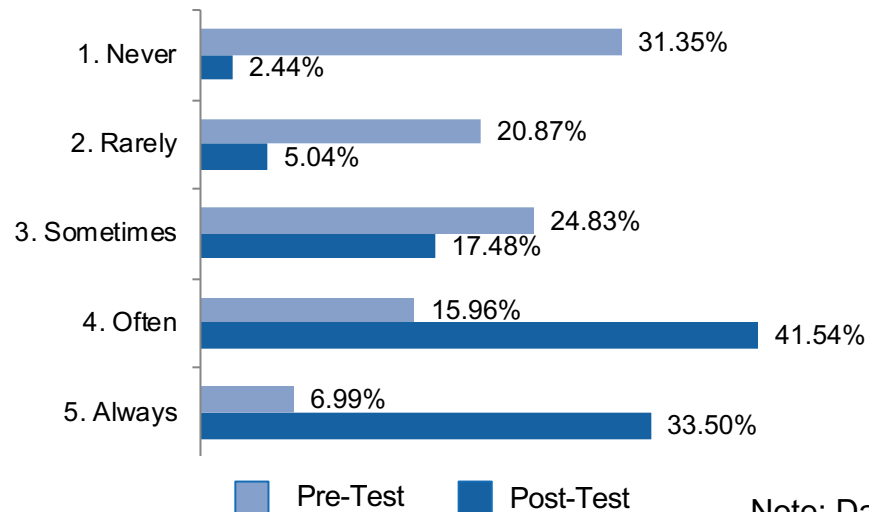
Confidence Question:

Please rate your confidence in your ability to recognize features consistent with idiopathic pulmonary fibrosis.



Practice Question:

How often do you order full pulmonary function testing, including DLCO, for a patient with unexplained dyspnea on exertion?



Pre-Test Post-Test

Note: Data is unmatched