Conversations in Pulmonology: 2020

Optimizing Pulmonary Arterial Hypertension (PAH) Outcomes Through Risk Stratification and Patient Adherence

Final Outcomes Report

Actelion Grant ID: 59955621

October 27, 2020

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Conversations in Pulmonology, 2020:

This curriculum focused diagnosing, selecting therapy for, and promoting adherence of patients with pulmonary arterial hypertension

Participation

803
Total Attendees

2 Virtual Sessions

330 certificates issued to date

This education has the potential to impact
1,523,676
Patients on an annual basis.

28,498 – 30,104
Patients Weekly

2020 Session	Date	Attendees
Conversations in Pulmonology	6/20/20	476
Rebroadcast	6/27/20	327
Total		**803**

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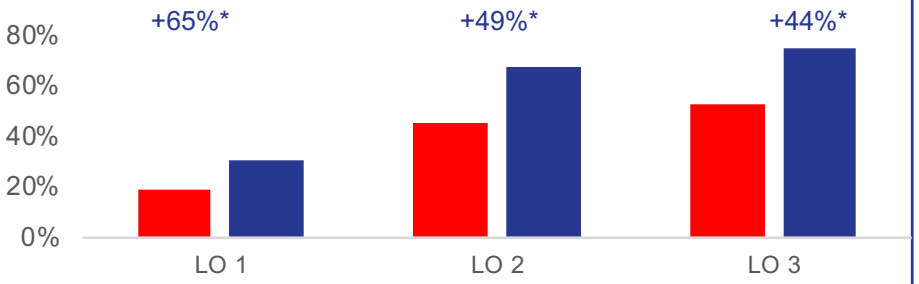
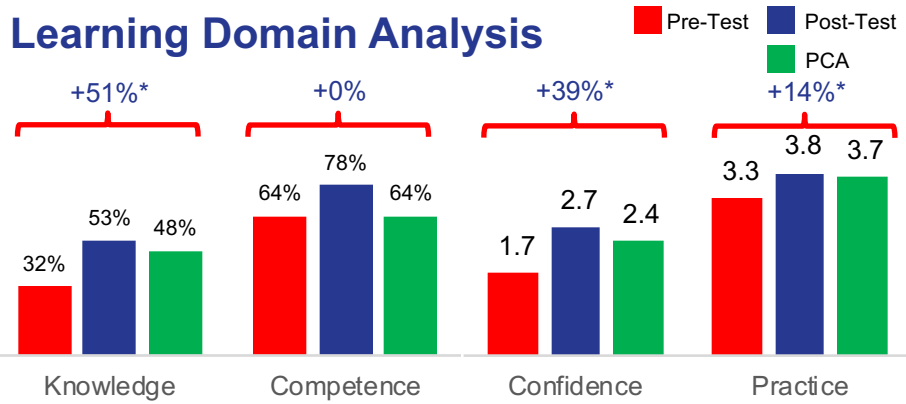
Learning Gains Across Objectives



- **LO 1, 65%* Improvement:** Utilize updated definitions and diagnostic evaluations to recognize patients with PAH
- **LO 2, 49%* Improvement:** Incorporate risk stratification for selecting and escalating therapy in patients with PAH, including the use of new and emerging treatment approaches
- **LO 3, 44%* Improvement:** Promote patient adherence through the management of adverse events with PAH therapies

Learning Domain Analysis



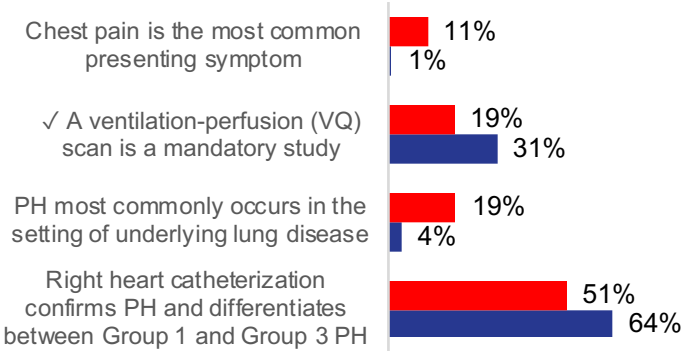
- In each of the four curriculum learning domains, substantial and significant gains were achieved from Pre- to Post-Test
- The strongest improvements, but lowest Pre- and Post-Test scores, were measured in Knowledge
- Knowledge scores were driven down by an item addressing mandatory ventilation-perfusion scanning in the evaluation of pulmonary hypertension
- Low Confidence may reflect possible learner awareness of outstanding gaps in proficiency
- In practice strategy, where learners reported how often they order right heart catheterization for a patient suspected of having PAH, average ratings increased to a moderate Post-Test value

Persistent Learning Gaps/Needs

Role of ventilation-perfusion scanning in evaluation of PH

Despite improvements in score on a Knowledge item on the evaluation of pulmonary hypertension, learners struggled at Post-Test to identify a ventilation-perfusion scan as mandatory. Many learners incorrectly selected "right heart catheterization confirms PH and differentiates between Group 1 and Group 3 PH."

Which of the following is true regarding the evaluation of pulmonary hypertension (PH)?



Tailoring PH therapy based on risk category

On a Knowledge item addressing use of oral combination therapies to treat PH in patients with different levels of risk, low Post-Test scores were measured despite strong improvements.

Which of the following statements about combination oral therapies for pulmonary arterial hypertension (PAH) is correct?

At Post-Test, only 68% of learners correctly answered: "Oral combination therapy is recommended as initial treatment for intermediate risk patients"

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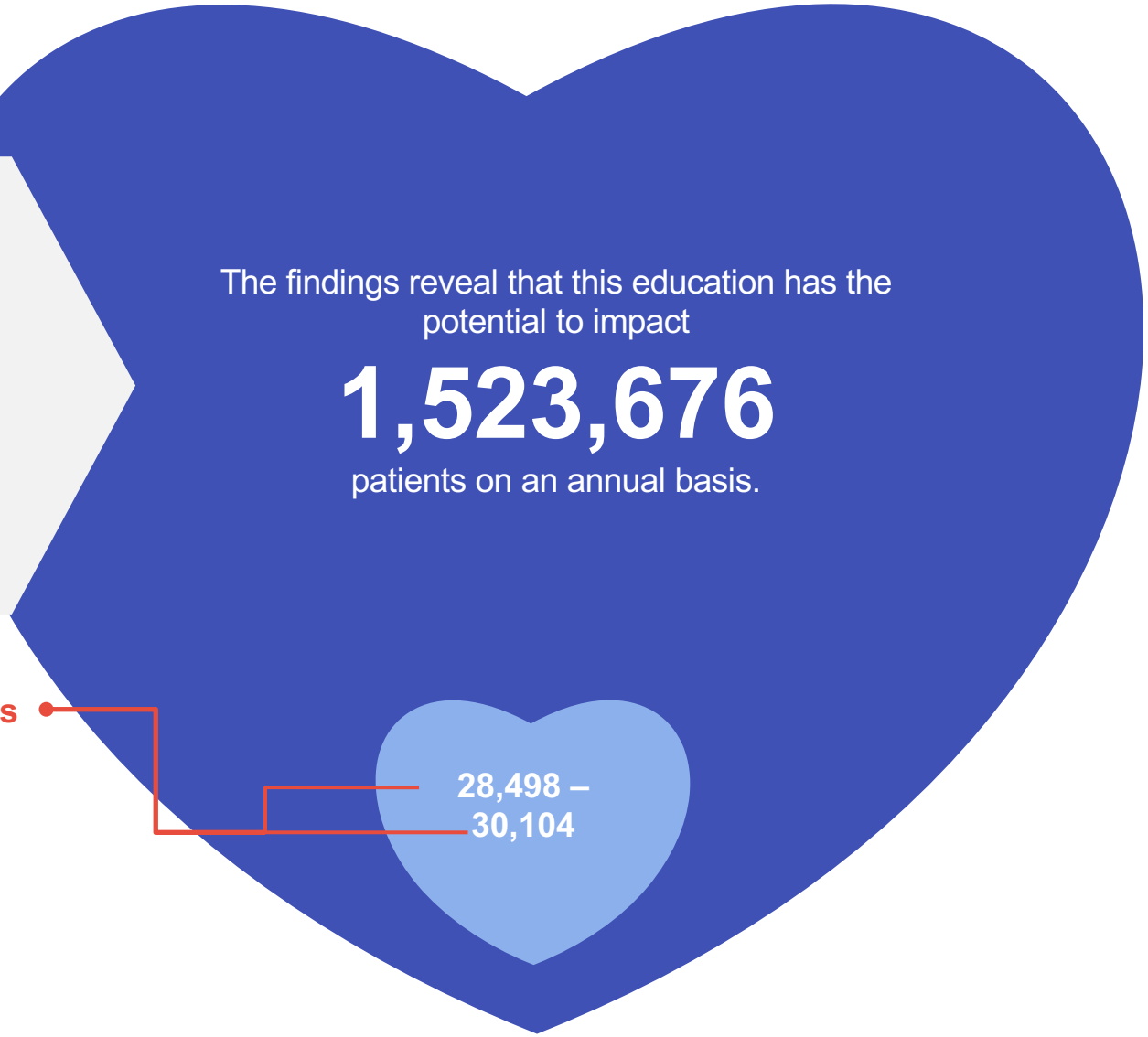
Curriculum Patient Impact

In the Post-Test, learners (N = 248) were asked to report how many patients they see per week in any clinical setting by selecting a range. The resulting distribution of learner responses was then extrapolated to reflect the total number of learners who have attended the sessions.



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Head of Alpha-1 Foundation Clinical Resource Center
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Commercial Support

The Conversation in Pulmonology: 2020 CME activity was supported through educational grants or donations from the following companies:

- Actelion Pharmaceuticals US, Inc.
- Boehringer Ingelheim Pharmaceuticals, Inc.
- Genentech, a member of the Roche Group
- Mallinckrodt LLC

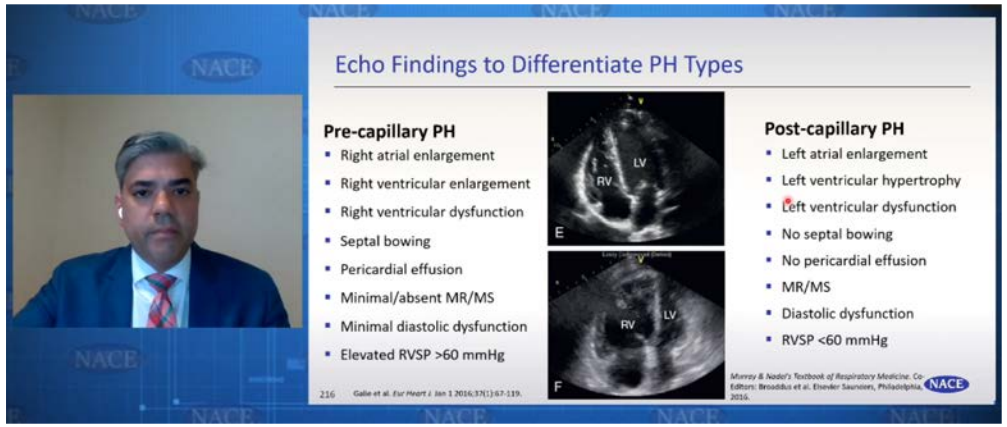
Overview

Learning Objectives

- Utilize updated definitions and diagnostic evaluations to recognize patients with PAH
- Incorporate risk stratification for selecting and escalating therapy in patients with PAH, including the use of new and emerging treatment approaches
- Promote patient adherence through the management of adverse events with PAH therapies

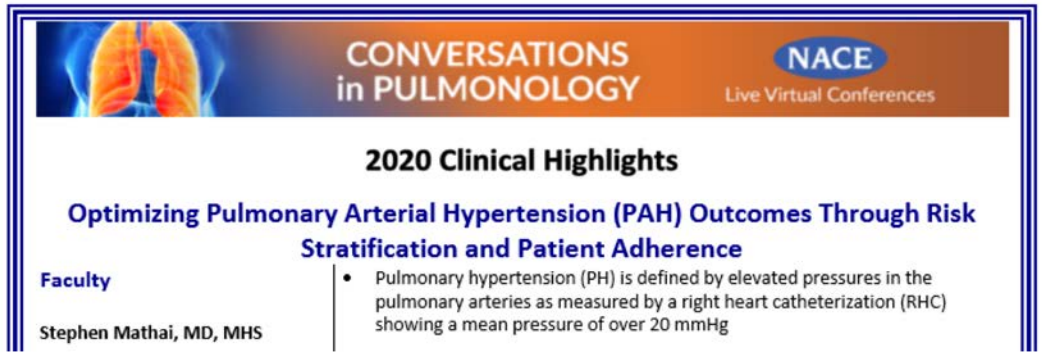
Curriculum Overview

1 Accredited Live Virtual Symposia, with 1 Virtual Rebroadcast: June 2020



Clinical Highlights eMonograph

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



Enduring CME Symposium Webcast

Available at: https://www.naceonline.com/courses/optimizing-pulmonary-arterial-hypertension-pah-outcomes-through-risk-stratification-and-patient-adherence

Optimizing Pulmonary Arterial Hypertension (PAH) Outcomes Through Risk Stratification and Patient Adherence

COURSE SUMMARY

Cost: Free

Start Date: 08/01/2020

Expiration Date: 07/31/2021

Target Audience:

Pulmonologists, Radiologists, Internists, and Primary Care Providers

Format: Webcast

Estimated Time To Complete CME Activity: 1.0 hour

Credit(s):
1.0 *AMA PRA Category 1 Credit*™
1.0 AANP Contact hour which includes 0.75 pharmacology hours

Hardware/Software Requirements: Any web browser

Speaker

Stephen Mathai, MD, MHS
Associate Professor of Medicine
Johns Hopkins Pulmonary Hypertension Program
Baltimore, MD

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Outcomes Methodology

Learning outcomes were measured using matched Pre-Test and Post-Test scores for Knowledge, Performance, 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

2020 Session	Date	Attendees
Conversations in Pulmonology	6/20/20	476
Rebroadcast	6/27/20	327
Total		**803**

Level 1
Participation
Demographics
Patient Reach

Participation

803*
Total Attendees

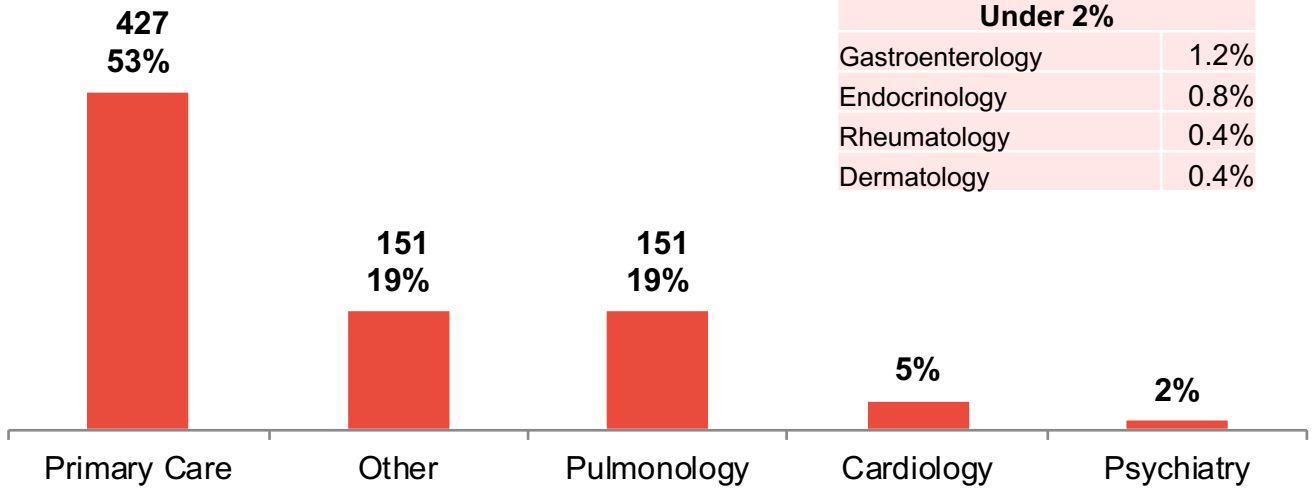
2 Virtual Sessions

183 Follow-up Participants
23% Rate of follow-up engagement

*These numbers represent the total number of attendees, irrespective of assessment participation

Level 1: Demographics and Patient Reach

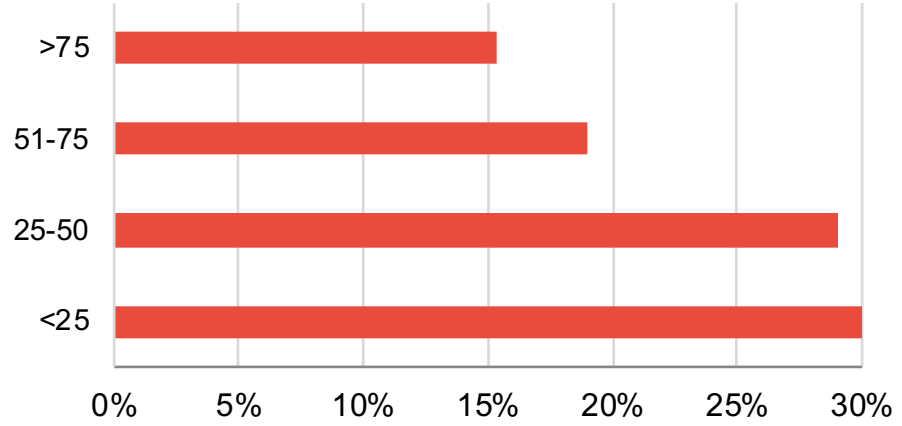
Specialty



Under 2%	
Gastroenterology	1.2%
Endocrinology	0.8%
Rheumatology	0.4%
Dermatology	0.4%

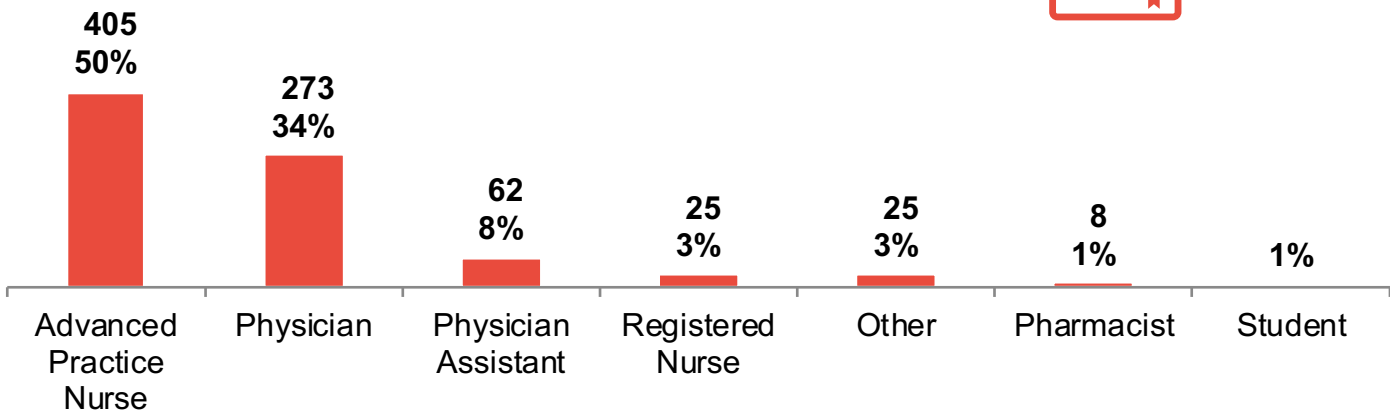
Patient Care Focus: 89%

Patients seen each week, in any clinical setting:

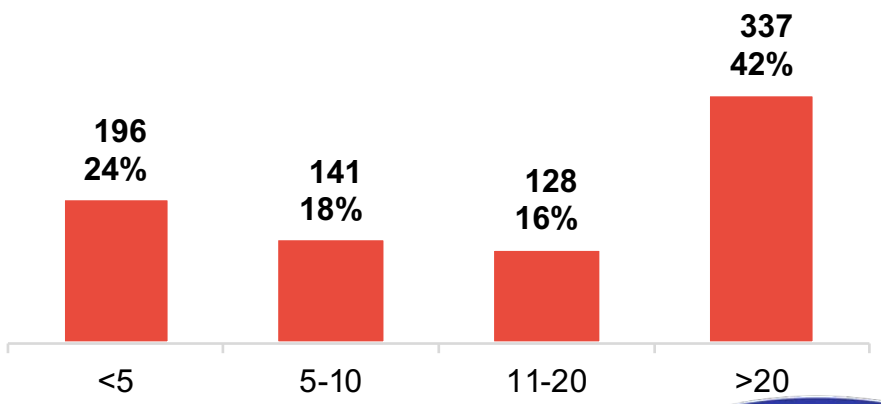


Average number of patients seen each week per clinician: 41

Profession



Years in Practice



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Level 2-5:
Outcomes Metrics

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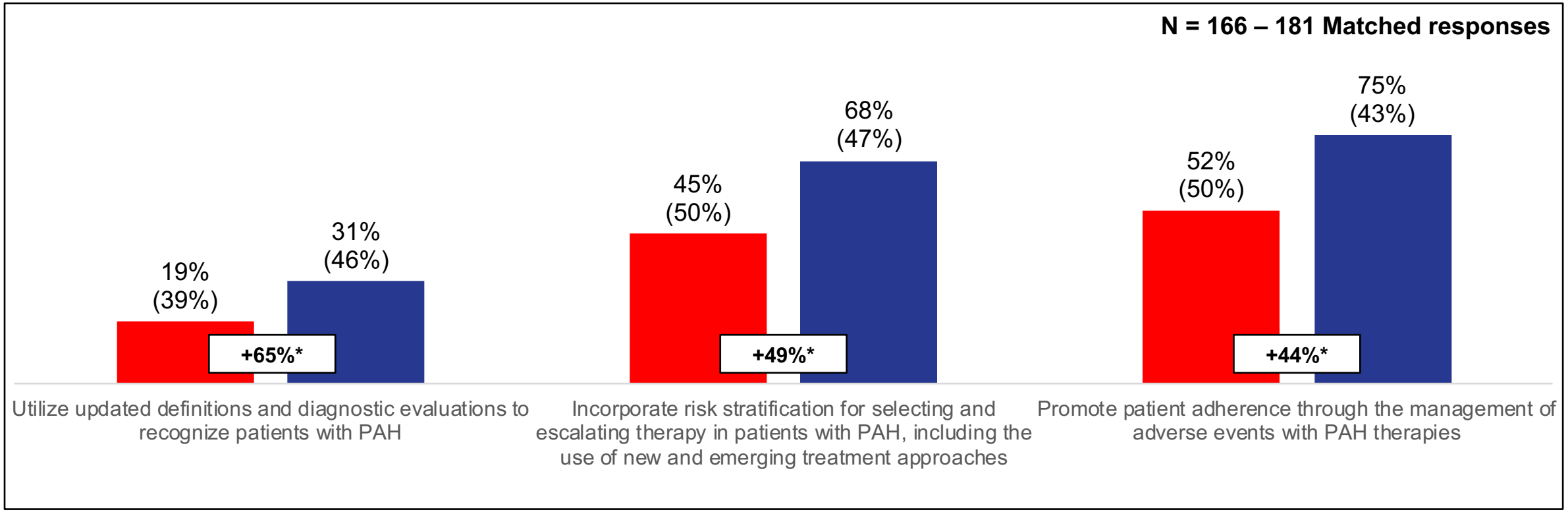
Learning Objective Analysis



- Across all three curriculum Learning Objectives, substantial and significant improvements were measured from low Pre-Test scores (of 44% to 65%)
- Despite these gains, low scores at Post-Test (31%) were measured on utilizing definitions and diagnostic evaluations to recognize patients with PAH
- Highest Post-Test scores were seen on promotion of patient adherence through the management of adverse events with PAH therapies

* indicates significance, $p < 0.05$

Learning Objective Analysis

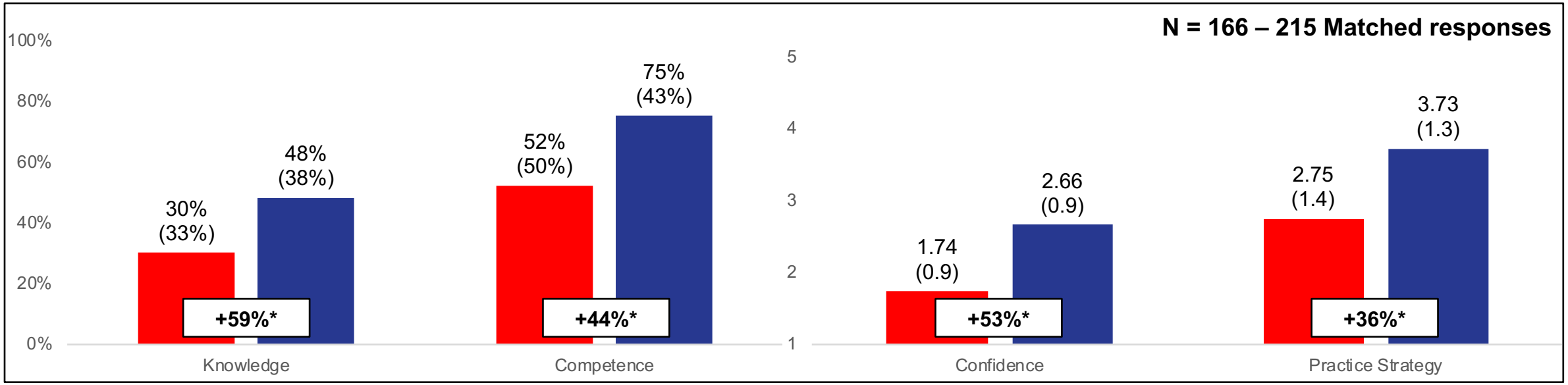
Cohort comparison by profession

Matched data, * indicates significance, $p < 0.05$

Learning Objective	Advanced Practice Nurses				Physicians			
	N	Pre-Test	Post-Test	Change	*N*	Pre-Test	Post-Test	Change
Utilize updated definitions and diagnostic evaluations to recognize patients with PAH	82	20% (40%)	27% (44%)	+38%*	70	16% (36%)	34% (47%)	+118%*
Incorporate risk stratification for selecting and escalating therapy in patients with PAH, including the use of new and emerging treatment approaches	76	39% (49%)	68% (46%)	+73%*	65	51% (50%)	72% (45%)	+42%*
Promote patient adherence through the management of adverse events with PAH therapies	75	52% (50%)	80% (40%)	+54%*	65	57% (50%)	75% (43%)	+32%*

- For both advanced practice nurses and physicians, significant gains were measured from Pre- to Post-Test on each of the four curriculum Learning Objectives
- Physicians achieved stronger improvements compared to advanced practice nurses in utilizing updated definitions and diagnostic evaluations to recognize patients with PAH
- On incorporating risk stratification for selecting and escalating therapy, and promoting patient adherence through the management of adverse events, advanced practice nurses achieved stronger improvements from lower Pre-Test scores compared to physicians

Learning Domain Analysis



- In each of the four curriculum learning domains, substantial and significant gains were achieved from Pre- to Post-Test
- The strongest improvements, but lowest Pre- and Post-Test scores, were measured in Knowledge
  - Knowledge scores were driven down by an item addressing mandatory ventilation-perfusion scanning in the evaluation of pulmonary hypertension
- Low Confidence may reflect possible learner awareness of outstanding gaps in proficiency
- In practice strategy, where learners reported how often they order right heart catheterization for a patient suspected of having PAH, average ratings increased to a moderate Post-Test value (3.7)

* indicates significance, $p < 0.05$

Learning Domain Analysis

Cohort comparison by profession

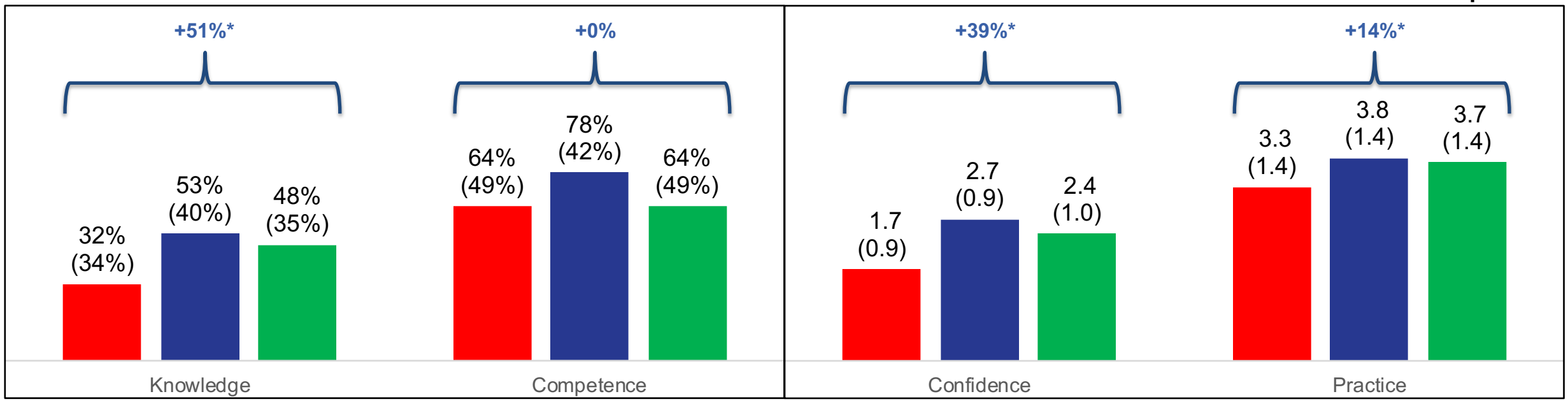
Matched data, * indicates significance, $p < 0.05$

Learning Domain	Advanced practice nurses				Physicians			
	N	Pre-Test	Post-Test	% Change	*N*	Pre-Test	Post-Test	% Change
Knowledge	83	28% (31%)	46% (33%)	+62%*	76	31% (34%)	53% (40%)	+70%*
Competence	75	52% (50%)	80% (40%)	+54%*	65	57% (50%)	75% (43%)	+32%*
Confidence	78	1.6 (0.8)	2.6 (0.9)	+58%*	66	2.0 (1.0)	2.9 (0.8)	+50%*
Practice	98	2.5 (1.4)	3.6 (1.3)	+42%*	84	3.0 (1.4)	4.0 (1.2)	+33%*

- When comparing the scores of advanced practice nurses and physicians by learning domain, both groups achieved significant gains from Pre- to Post-Test, across all four domains
- Physicians achieved stronger improvements compared to advanced practice nurses in Knowledge, while advanced practice nurses had greater gains across the other domains
  - Across all four domains, Pre- and Post-Test scores of physicians were higher compared to those of advanced practice nurses

4-Week Retention Analysis

By Learning Domain



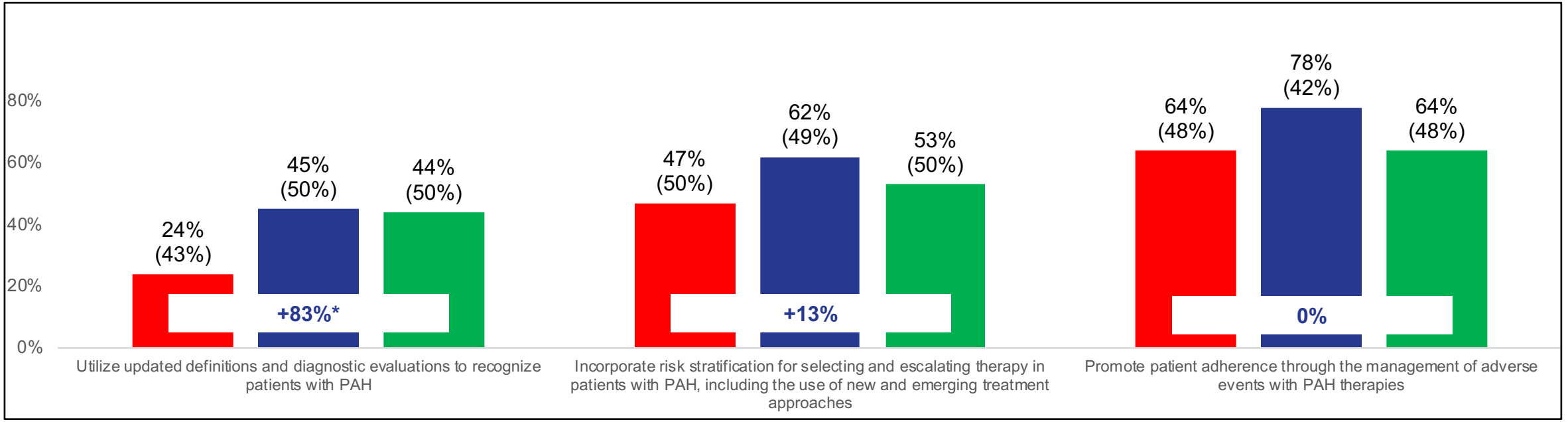
- Four to six weeks following their engagement in one of the curriculum sessions, learners were prompted to complete a brief Post Curriculum Assessment (PCA), which repeated items from each of the four curriculum learning domains
- In each domain except Competence, significant net gains were achieved from Pre-Test to PCA measurements
  - Despite these gains, some score slippage was seen from Post-Test to PCA in all domains
- In Competence, no meaningful change was seen between Pre-Test and PCA measurements, highlighting an opportunity for further education
  - The single Competence item in this curriculum covered management of nausea as a side effect of treprostinil

* indicates significance, $p < 0.05$

4-Week Retention Analysis

By Learning Objective

N = 47 – 55 Matched responses



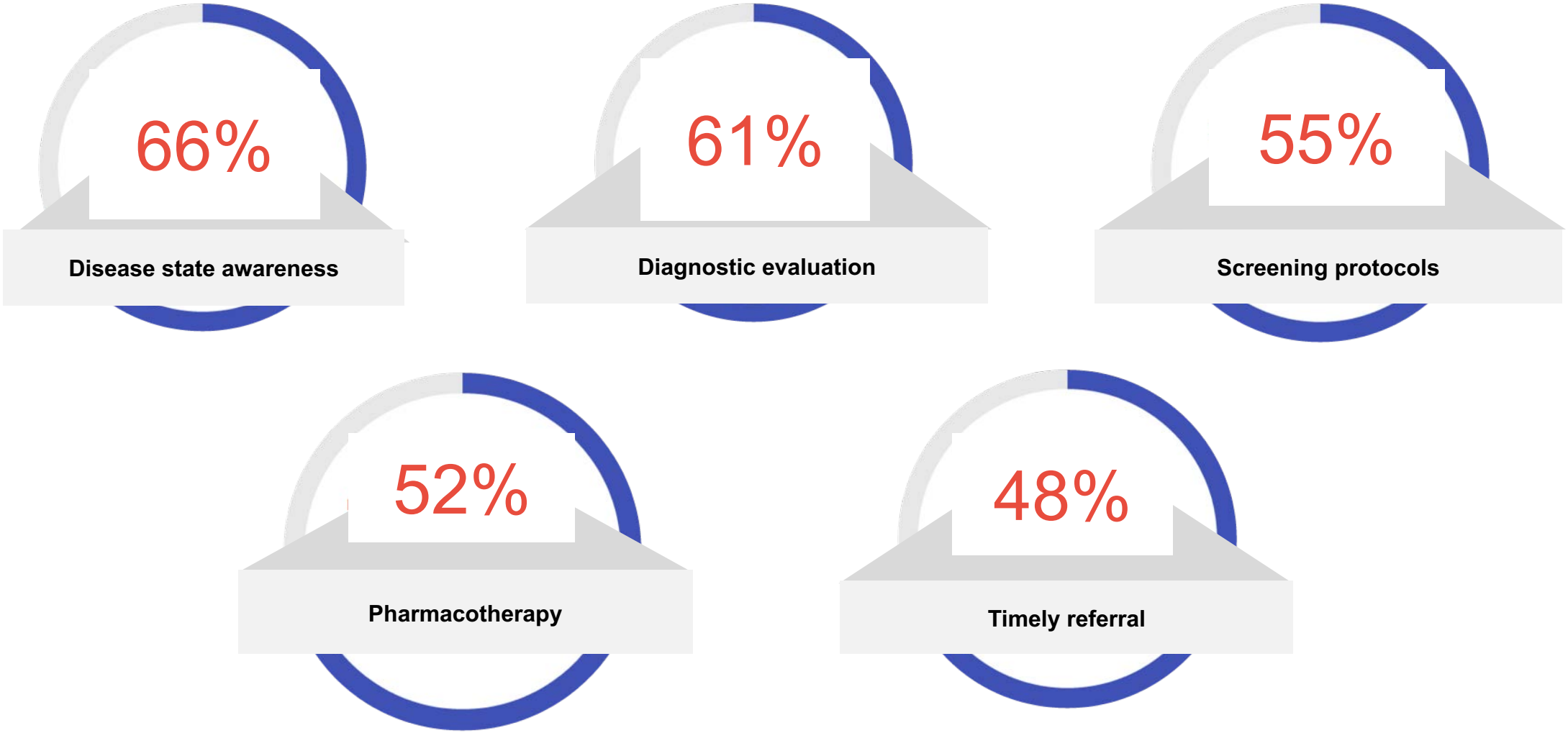
- When examining results by Learning Objective, net gains were achieved from Pre-Test to PCA measurements on utilization of updated definitions and diagnostic evaluations to recognize patients with PAH, and incorporation of risk stratification for selecting and escalating therapy in patients with PAH
- No change was seen on the promotion of patient adherence through the management of adverse events with PAH therapies
    - This Objective was mapped to a single Competence item discussing management of nausea as a side effect of treprostinil

* indicates significance, $p < 0.05$

(4-week Post Assessment)

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

N = 166



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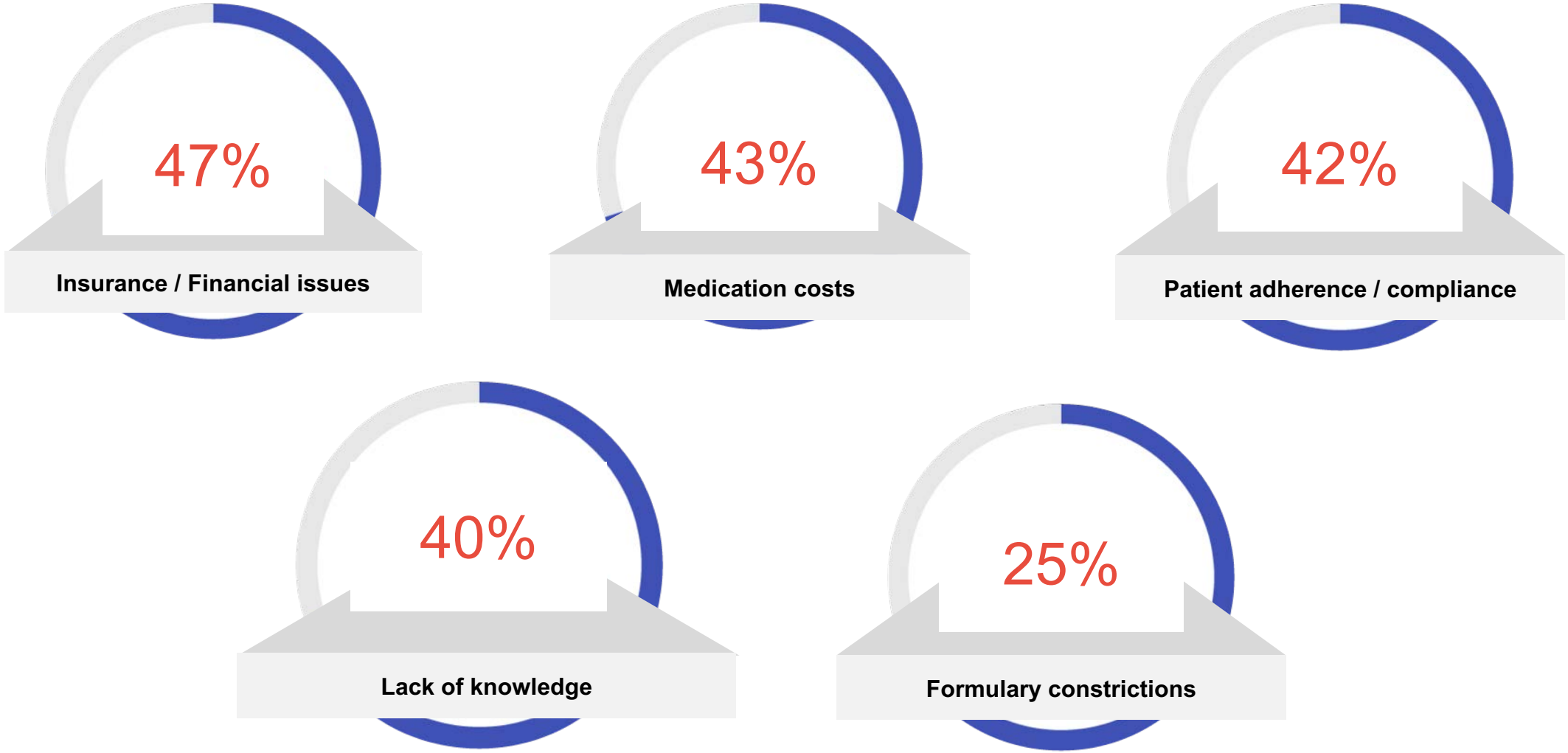
(4-week Post Assessment)

What specific *barriers* have you encountered that may have prevented you from successfully implementing strategies for patients with PAH since this CME activity? (Select all that apply.)

N = 166



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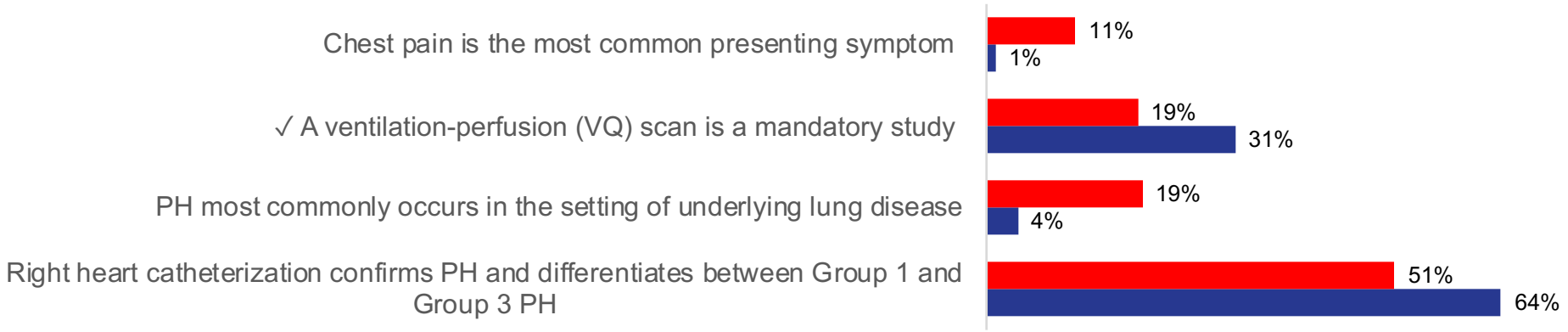
Identified Learning Gap, 1 of 2:
Role of ventilation-perfusion scanning in evaluation of PH

Despite improvements in score on a Knowledge item on the evaluation of pulmonary hypertension, learners struggled at Post-Test to identify a ventilation-perfusion scan as mandatory. Many learners incorrectly selected "right heart catheterization confirms PH and differentiates between Group 1 and Group 3 PH."

Which of the following is true regarding the evaluation of pulmonary hypertension (PH)?

Results:

- At Post-Test, only 31% of learners correctly answered: "A ventilation-perfusion (VQ) scan is a mandatory study"



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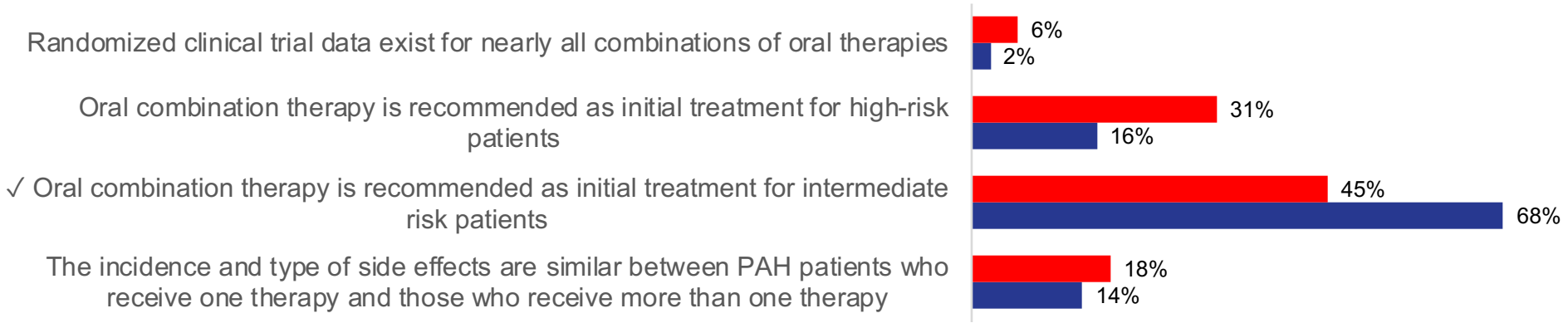
Identified Learning Gap, 2 of 2:
Tailoring PH therapy based on risk category

On a Knowledge item addressing use of oral combination therapies to treat PH in patients with different levels of risk, low Post-Test scores were measured despite strong improvements.

Which of the following statements about combination oral therapies for pulmonary arterial hypertension (PAH) is correct?

Results:

- At Post-Test, 68% of learners correctly answered: “Oral combination therapy is recommended as initial treatment for intermediate risk patients”



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Overall Educational Impact

- Substantial, significant improvements were seen across all four curriculum learning domains, from Pre- to Post-Test (Knowledge, Competence, Confidence, and practice strategy)
    - These gains were stronger for advanced practice nurses compared to physicians across all domains except Knowledge
    - Improvements were seen across all individual Knowledge and Competence items, with improvements ranging from 44% to 65%
- Significant improvements ranging from 44% to 65% were measured across all Learning Objectives, with Post-Test scores ranging from 31% to 75%
    - Low Post-Test scores (31%) were measured in utilization of updated definitions and diagnostic evaluations to recognize patients with PAH, driven by an item where many learners selected “right heart catheterization confirms PH and differentiates between Group 1 and Group 3 PH” as true regarding the evaluation of PH
- On a follow-up assessment, net gains were measured from Pre-Test across all learning domains and objectives except promotion of patient adherence through management of adverse events
- The analysis of Knowledge and Competence items identified two **opportunities for further education:**
    - Role of ventilation-perfusion scanning in evaluation of PH
    - Tailoring PH therapy based on risk category

Appendix

Slides 26 – 28: Pre-Test to Post-Test matched item responses

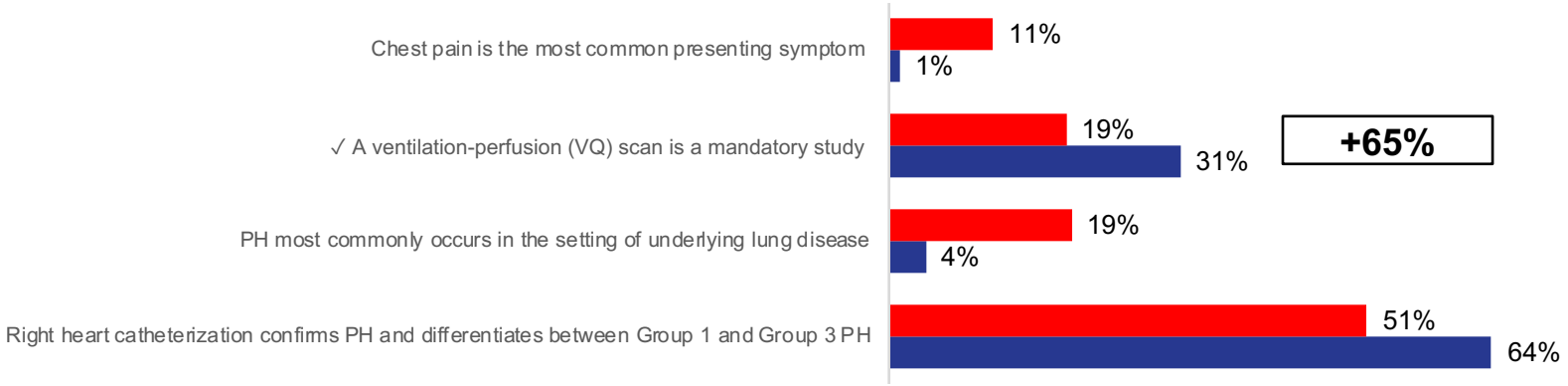
Slides 29 – 31: Pre-Test, Post-Test, and PCA matched item responses*

*Both sets of response distributions are included due to the smaller sample size of matched PCA respondents

Knowledge Items

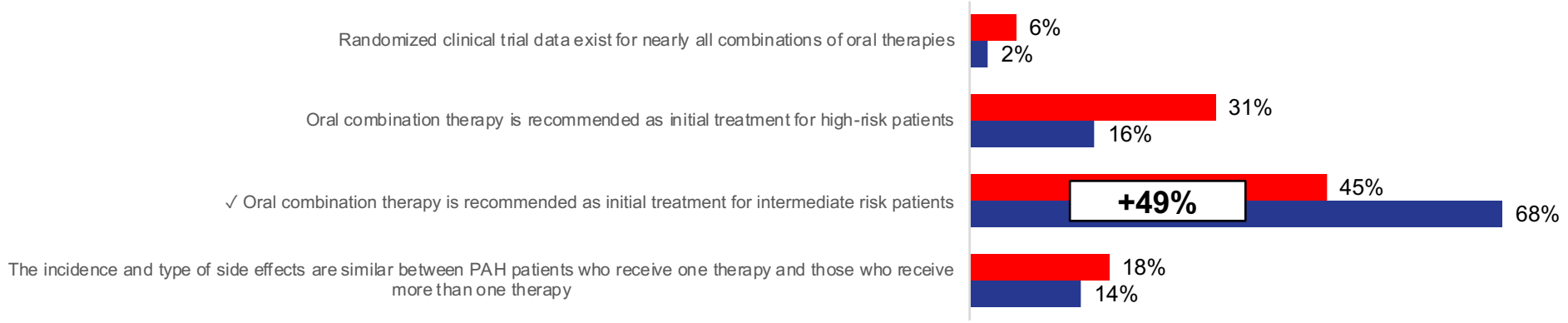
Which of the following is true regarding the evaluation of pulmonary hypertension (PH)?

N = 181 Matched responses



Which of the following statements about combination oral therapies for pulmonary arterial hypertension (PAH) is correct?

N = 170 Matched responses



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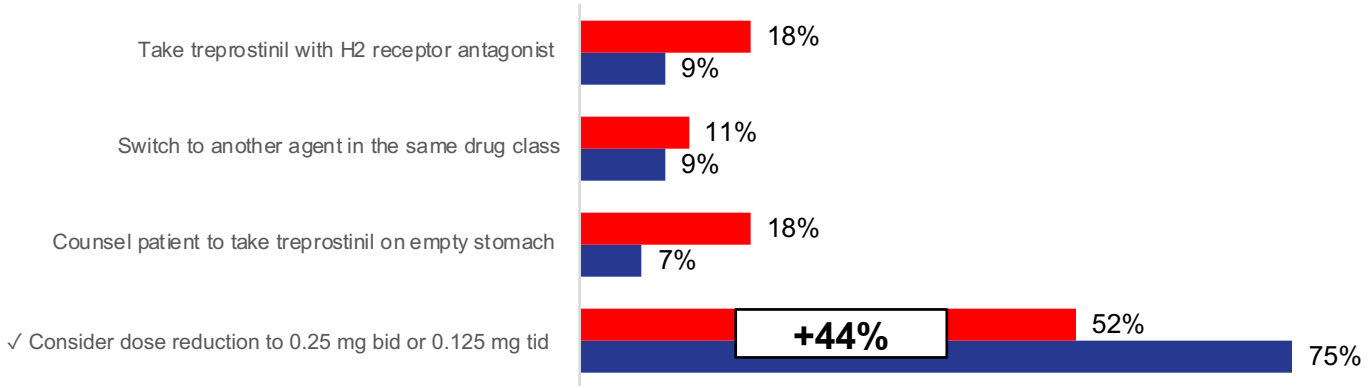
Competence Items

68 y/o man with 3-year history of PAH presents for a checkup. Managed with treprostinil 0.5 mg bid. On questioning, reports that he sometimes does not take treprostinil due to nausea; when he does take treprostinil, he takes with a full meal. He has tried a PPI and ondansetron, with no relief. What might be an effective approach to managing this side effect?

N = 166 Matched responses



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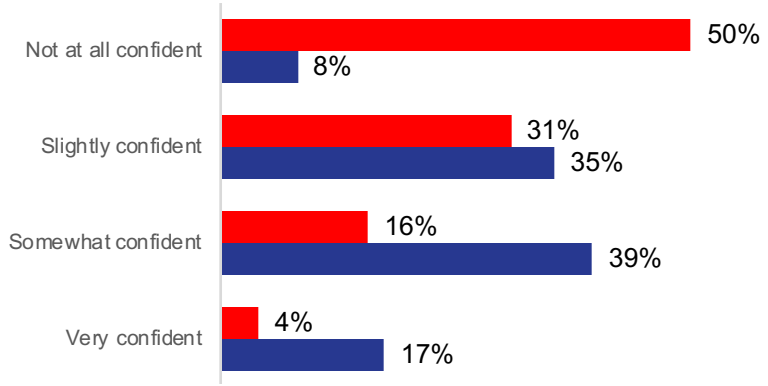
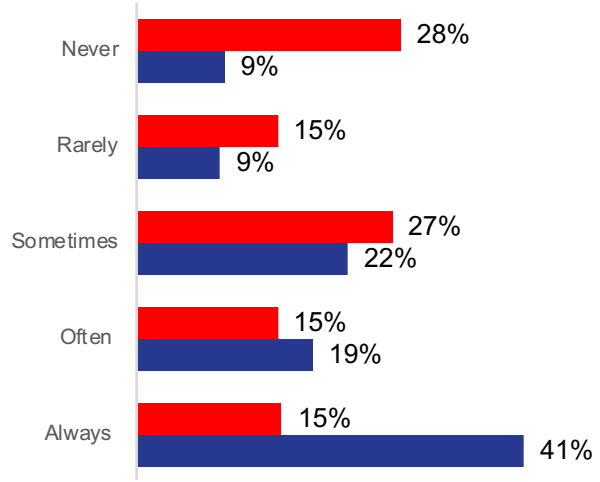
Confidence and Practice Strategy Items

How confident are you in your ability to select therapy for a patient with PAH based on risk stratification? **N = 173 Matched responses**



How often do you order right heart catheterization for a patient suspected of having PAH? **N = 215 Matched responses**



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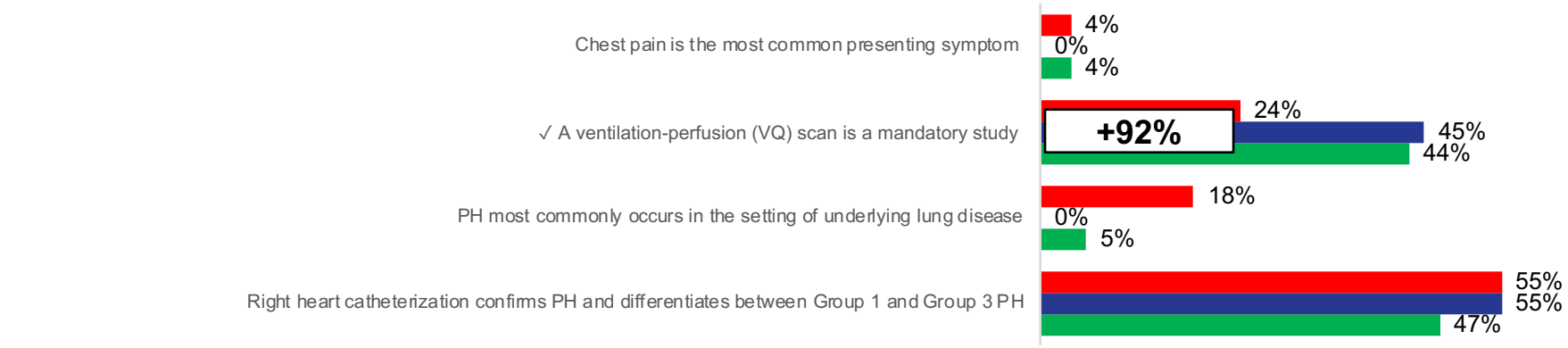
Knowledge Items

Post Curriculum Assessment (PCA)

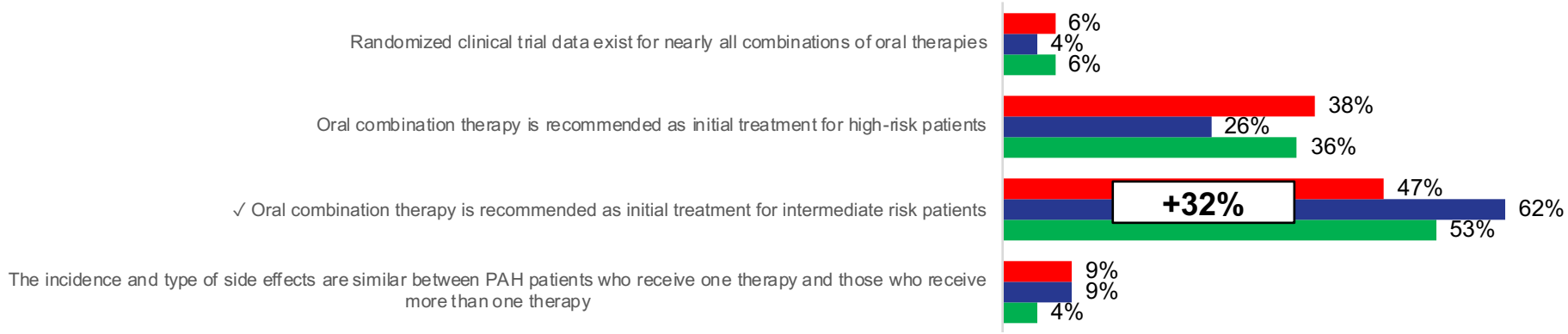
Which of the following is true regarding the evaluation of pulmonary hypertension (PH)?

N = 55 Matched responses



Which of the following statements about combination oral therapies for pulmonary arterial hypertension (PAH) is correct?

N = 47 Matched responses



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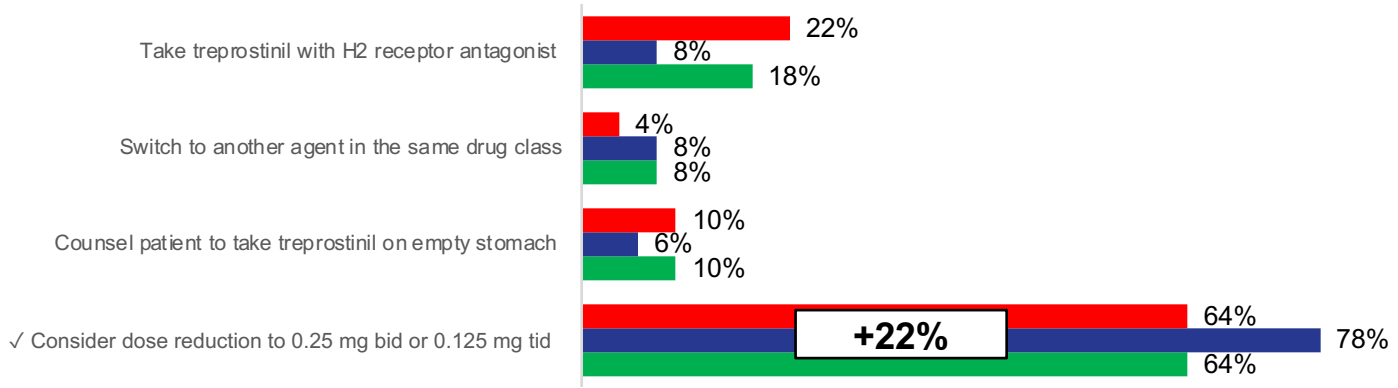
Competence Items

Post Curriculum Assessment (PCA)

68 y/o man with 3-year history of PAH presents for a checkup. Managed with treprostinil 0.5 mg bid. On questioning, reports that he sometimes does not take treprostinil due to nausea; when he does take treprostinil, he takes with a full meal. He has tried a PPI and ondansetron, with no relief. What might be an effective approach to **managing this side effect?**

N = 50 Matched responses



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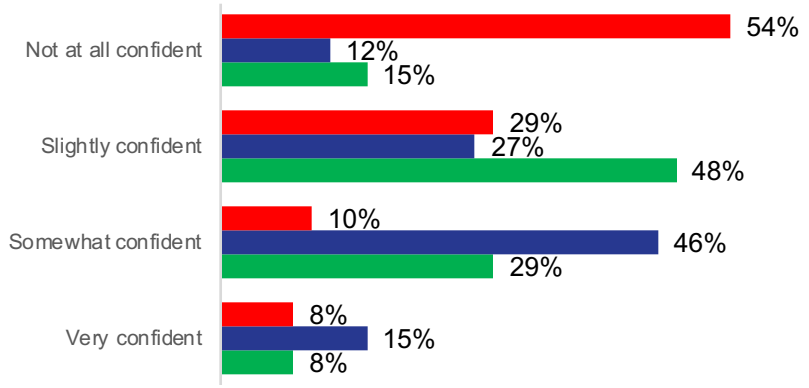
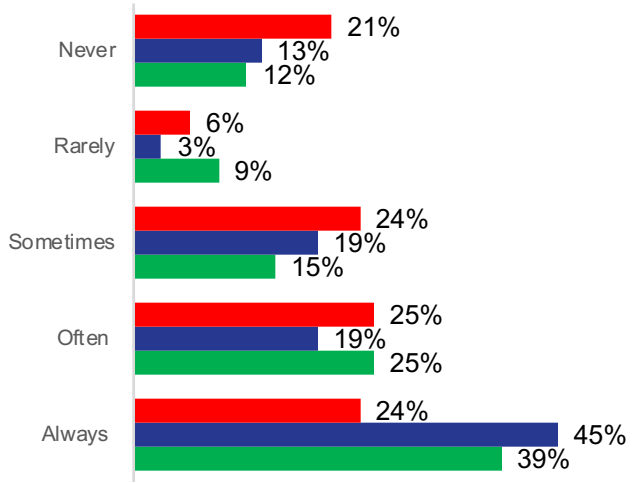
Confidence and Practice Strategy Items

Post Curriculum Assessment (PCA)

How confident are you in your ability to select therapy for a patient with PAH based on risk stratification? **N = 52 Matched responses**



How often do you order right heart catheterization for a patient suspected of having PAH? **N = 67 Matched responses**



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