Conversations in Cardiology: 2020

Pulmonary Arterial Hypertension and Right Heart Failure – Targeting Targeting Therapy for Optimal Outcomes

Final Outcomes Report

Actelion Grant ID: CG62162483

February 1, 2021

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ABC Association of Black Cardiologists, Inc.

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Conversations in Cardiology: 2020

This curriculum focused on the management of patients with PAH

Participation

821 Total Attendees

2 Virtual Sessions

402 certificates issued to date

2020 Session	Date	Attendees
Conversations in Cardiology	9/26/20	612
Conversations in Cardiology, rebroadcast	10/3/20	209
Total		**821**

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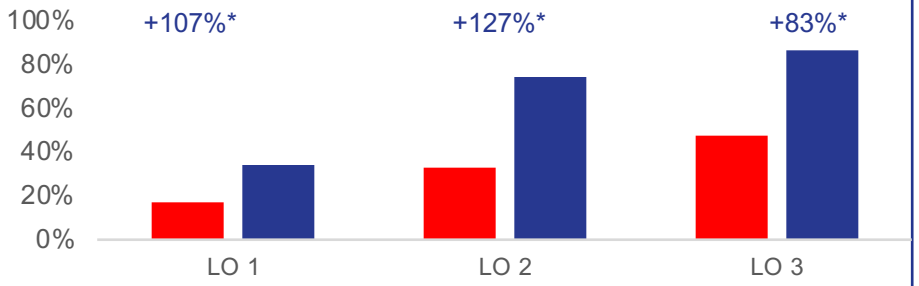
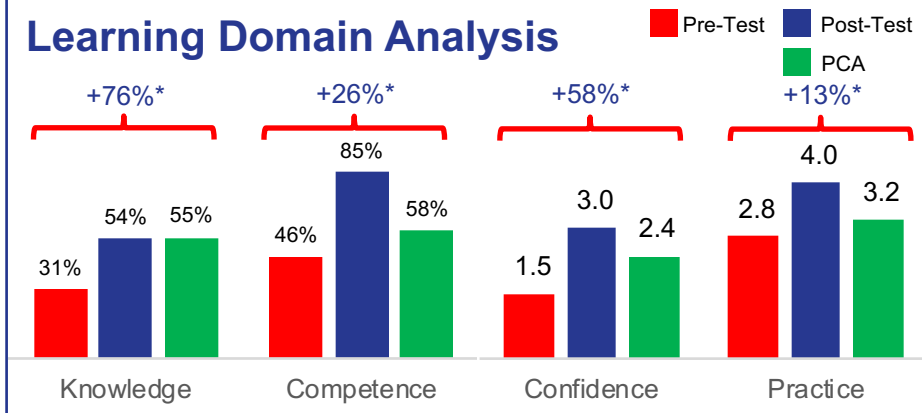
Learning Gains Across Objectives



- **LO 1, 107%* Improvement:** Recognize the role of the NO-sGC-cGMP pathway in the pathophysiology of PAH and RHF
- **LO 2, 127%* Improvement:** Implement goal-oriented treatment strategies for the management of patients with PAH and RHF
- **LO 3, 83%* Improvement:** Incorporate evidence for new and emerging treatments into the management of patients with PAH and RHF

Learning Domain Analysis

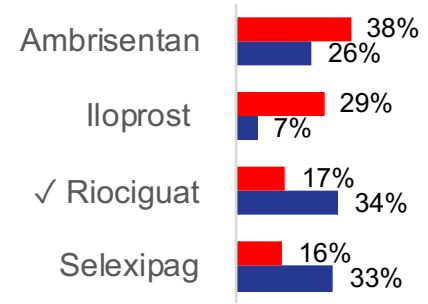


- In each of the four curriculum learning domains, substantial and significant gains were achieved from Pre- to Post-Test
- Strong gains, and highest Pre- and Post-Test scores, were measured in Competence, where improvement was driven by an item on selecting combination therapy as a first-line treatment for a patient just diagnosed with PAH
- Strongest improvements, but lowest Pre- and Post-Test scores, were seen in Knowledge, where learners struggled with an item on the pathophysiology of riociguat
- Low Pre- and Post-Test Confidence to select therapy for a patient based on risk level may indicate learner awareness of gaps in proficiency

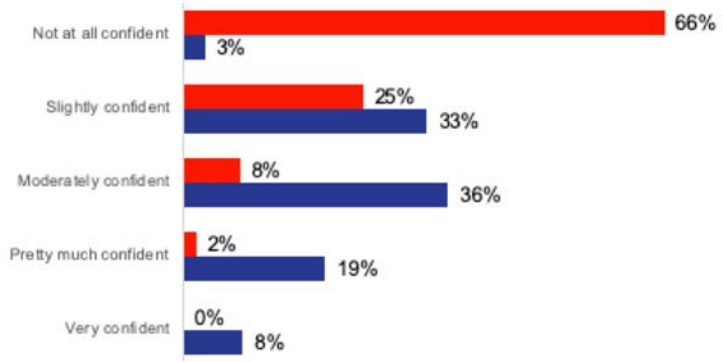
Persistent Learning Gaps/Needs

Mechanism of action of approved PAH therapies

Learners struggled to recognize the FDA approved treatment for PAH that acts by potentiating the vasodilatory activity of nitric oxide through stimulation of soluble guanylate cyclase



Low baseline confidence levels in ability to select therapy for PAH based on a patient's risk level



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Commercial Support

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

- Actelion Pharmaceuticals US, Inc.
- AstraZeneca Pharmaceuticals LP
- Eidos Therapeutics Inc.
- Esperion Therapeutics, Inc.
- Novartis Pharmaceuticals Corporation
- Novo Nordisk, Inc.
- Pfizer Inc.

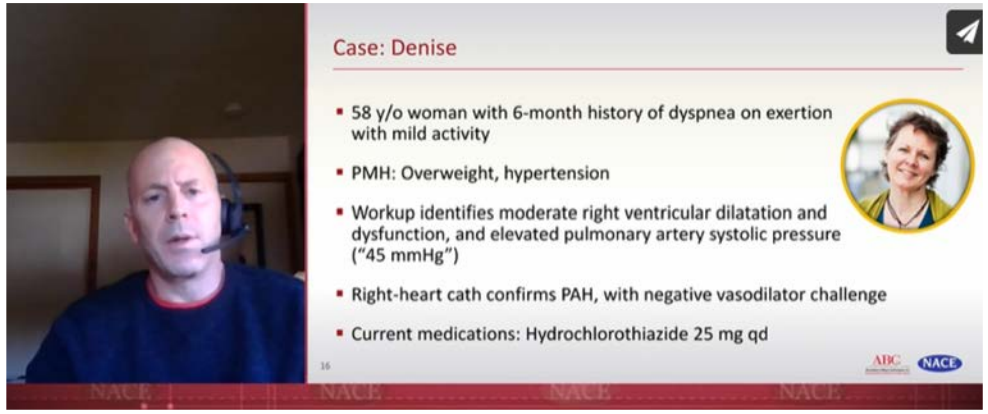
Overview

Learning Objectives

- Recognize the role of the NO-sGC-cGMP pathway in the pathophysiology of PAH and RHF
- Implement goal-oriented treatment strategies for the management of patients with PAH and RHF
- Incorporate evidence for new and emerging treatments into the management of patients with PAH and RHF

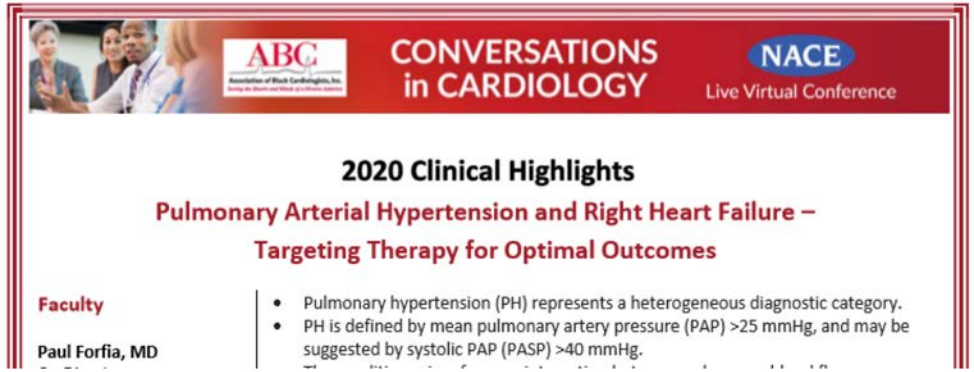
Curriculum Overview

1 Accredited Live Regional Symposium with 1 Rebroadcast: September 26, 2020 – October 3, 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/pulmonary-arterial-hypertension-and-right-heart-failure-targeting-therapy-for-optimal-outcomes

Pulmonary Arterial Hypertension and Right Heart Failure – Targeting Therapy for Optimal Outcomes

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COURSE SUMMARY

Cost: Free

Start Date: 10/25/2020

Expiration Date: 10/24/2021

Target Audience: Cardiologists, Nurse Practitioners (NPs), Physician Assistants (PAs), and other clinicians engaged in the care of patients with cardiovascular conditions.

Format: Webcast

Estimated Time To Complete CME Activity: 1.0 hour

Credits:
1.0 *AMA PRA Category 1 Credit*™
1.0 Contact hour which includes 0.50 pharmacology hours

Hardware/Software Requirements: Any web browser

Speaker

Paul Forfia, MD
Co-Director, Pulmonary Hypertension, Right Heart Failure & CTEPH Program
Temple University Hospital
Professor, Medicine, Lewis Katz School of Medicine at Temple University
Philadelphia, PA

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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 Cardiology	9/26/20	612
Conversations in Cardiology, rebroadcast	10/3/20	209
Total		**821**

Participation

Level 1
Participation
Demographics
Patient Reach

821*
Total Attendees

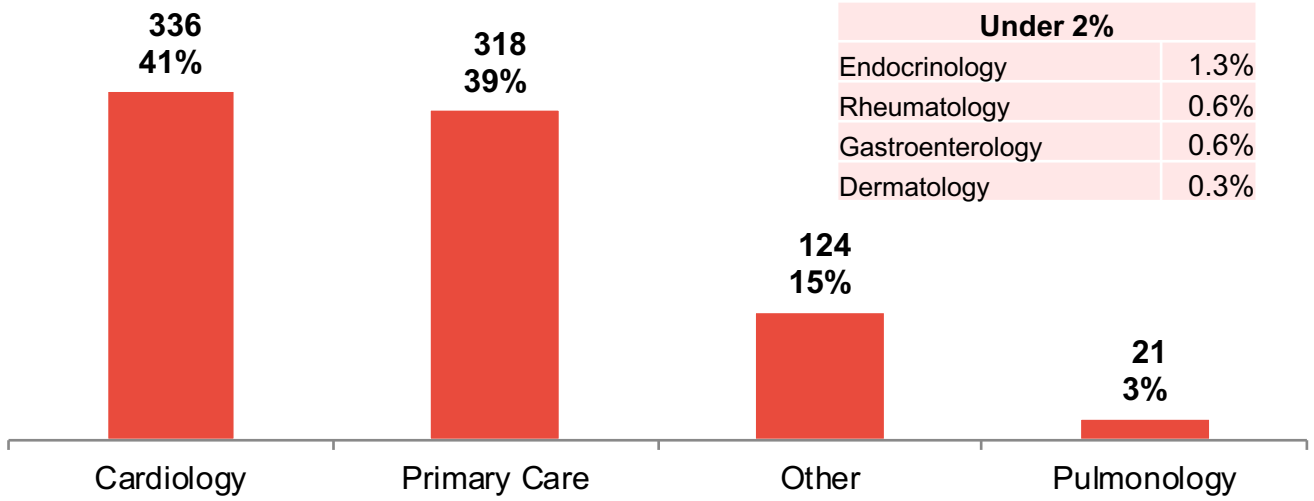
2 Virtual Sessions

169 Follow-up Participants
21% Rate of follow-up engagement

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

Level 1: Demographics and Patient Reach

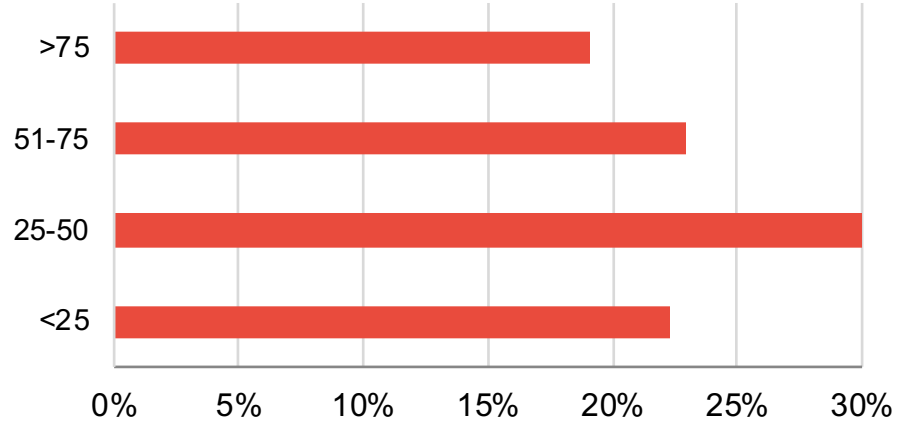
Specialty



Under 2%	
Endocrinology	1.3%
Rheumatology	0.6%
Gastroenterology	0.6%
Dermatology	0.3%

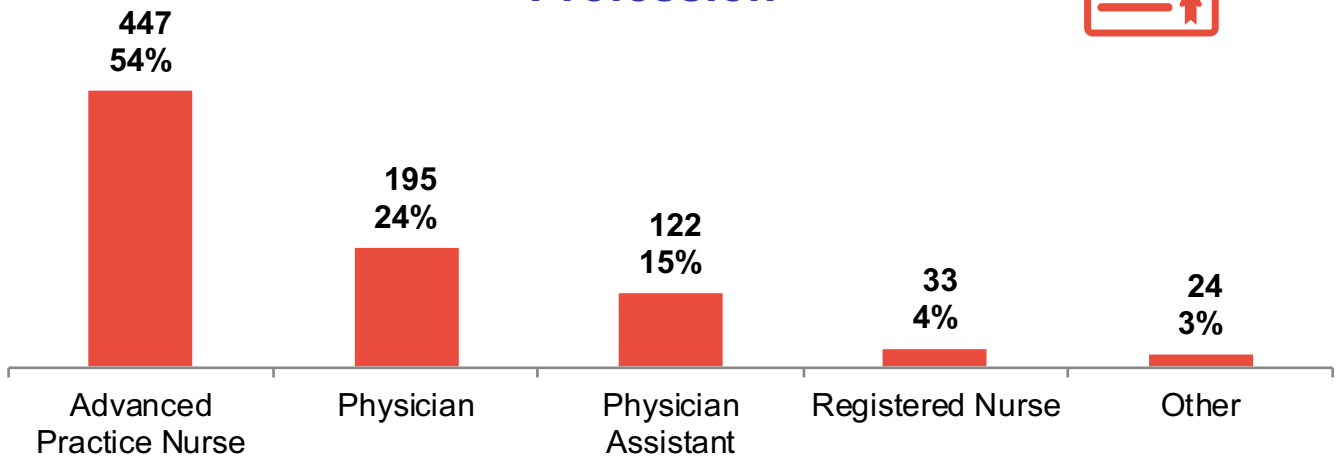
Patient Care Focus: 94%

Patients seen each week, in any clinical setting:

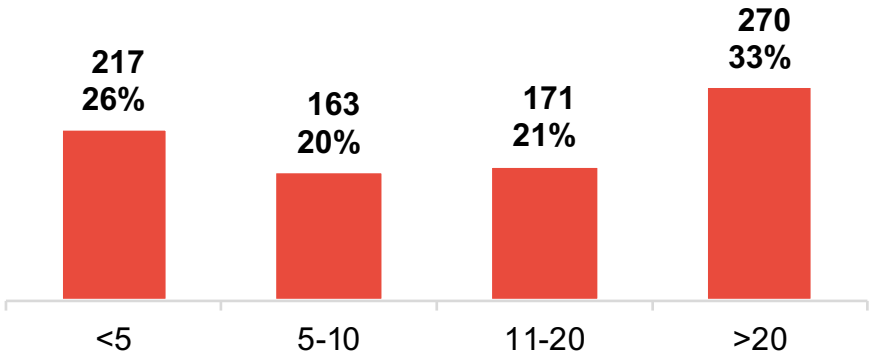


Average number of patients seen each week per clinician: 47

Profession



Years in Practice



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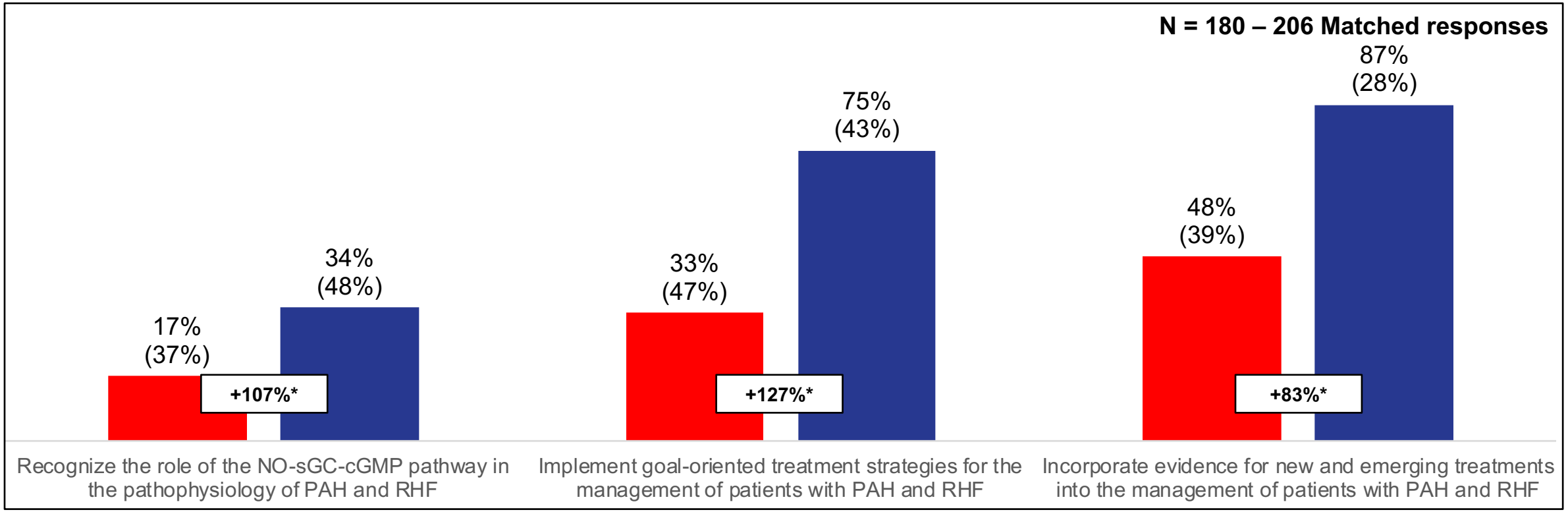
Level 2-5:
Outcomes Metrics

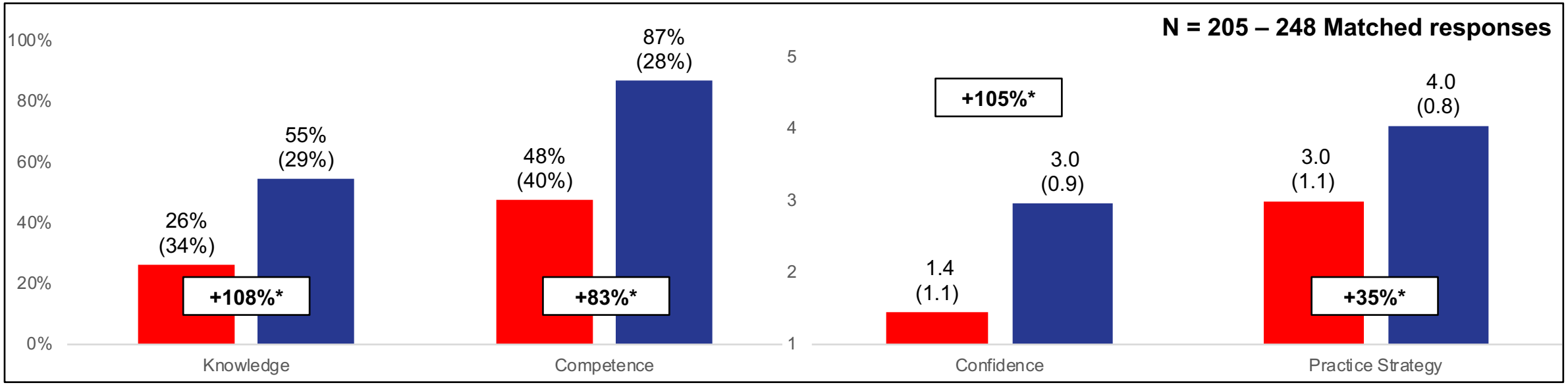
Learning Objective Analysis



- Across all three curriculum Learning Objectives, substantial and significant improvements were measured from low to moderate Pre-Test scores (17% to 48%)
- Strongest gains were measured on recognizing the role of the NO-sGC-cGMP pathway in the pathophysiology of PAH and RHF
  - Despite these improvements, Post-Test scores on this Objective were lowest (34%)
  - Low scores in this area were driven by an item on the mechanism of action of riociguat
- Moderate Post-Test scores were measured on other two Objectives, related to implementing goal-oriented treatment strategies and incorporating evidence for new and emerging treatments into the management of patients with PAH and RHF

* indicates significance, $p < 0.05$

Learning Domain Analysis



- In each of the four curriculum learning domains, substantial and significant gains were achieved from Pre- to Post-Test
- Strong gains, and highest Pre- and Post-Test scores, were measured in Competence, where improvement was driven by an item on selecting combination therapy as a first-line treatment for a patient just diagnosed with PAH
- Strongest improvements, but lowest Pre- and Post-Test scores, were seen in Knowledge, where learners struggled with an item on the pathophysiology of riociguat
- Low Pre- and Post-Test Confidence to select therapy for a patient based on risk level may indicate learner awareness of gaps in proficiency

* 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
Recognize the role of the NO-sGC-cGMP pathway in the pathophysiology of PAH and RHF	100	16% (37%)	28% (45%)	+75%*	41	20% (40%)	49% (50%)	+150%*
Implement goal-oriented treatment strategies for the management of patients with PAH and RHF	106	33% (47%)	74% (44%)	+123%*	40	38% (48%)	92% (26%)	+147%*
Incorporate evidence for new and emerging treatments into the management of patients with PAH and RHF	112	44% (39%)	88% (27%)	+100%*	44	55% (40%)	88% (26%)	+60%*

- For both advanced practice nurses and physicians, significant gains were measured from Pre- to Post-Test on each of the three curriculum Learning Objectives
- Physicians demonstrated stronger improvement compared to advanced practice nurses in recognizing the role of the NO-sGC-cGMP pathway in the pathophysiology of PAH and RHF, and implementing goal-oriented treatment strategies for the management of patients with PAH and RHF
- Advanced practice nurses achieved greater gains from lower Pre-Test scores in incorporating evidence for new and emerging treatments into the management of patients with PAH and RHF

Learning Domain Analysis

Cohort comparison by profession

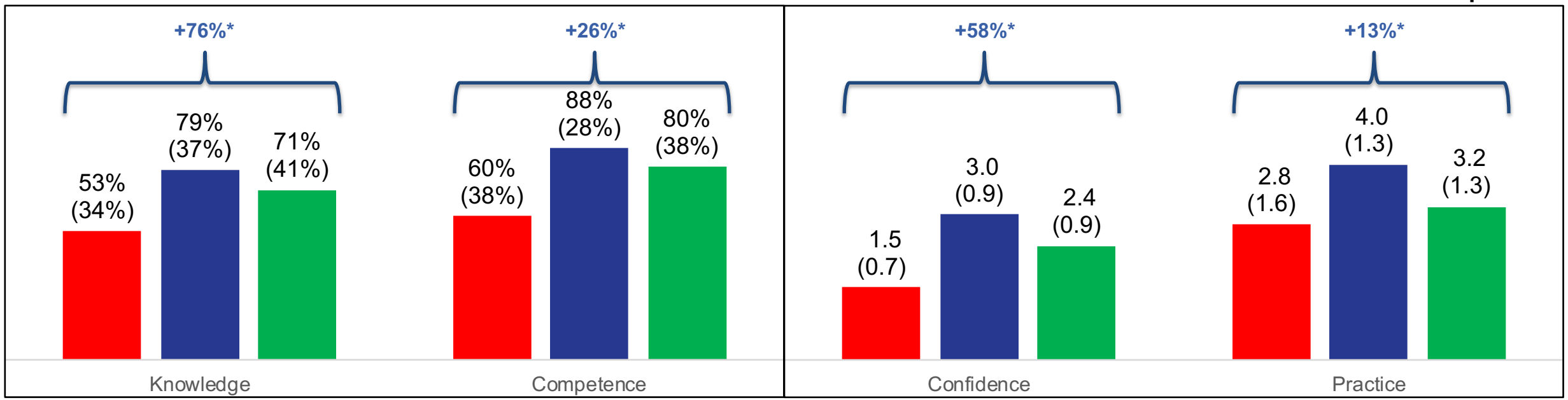
Matched data, * indicates significance, $p < 0.05$

Learning Domain	Advanced practice nurses				Physicians			
	N	Pre-Test	Post-Test	% Change	*N*	Pre-Test	Post-Test	% Change
Knowledge	115	26% (34%)	51% (36%)	+100%*	45	28% (37%)	68% (34%)	+144%*
Competence	112	44% (39%)	88% (27%)	+100%*	44	55% (40%)	88% (26%)	+60%*
Confidence	139	1.4 (0.69)	2.9 (0.93)	+109%*	51	1.7 (0.87)	3.1 (1.0)	+82%*
Practice	114	2.9 (1.5)	4.0 (1.1)	+36%*	42	3.0 (1.3)	4.2 (1.0)	+44%*

- When comparing the scores of advanced practice nurses and physicians by learning domain, both groups achieved substantial and significant gains from Pre- to Post-Test, across all four domains
- In Competence and Confidence, advanced practice nurses achieved stronger gains from lower Pre-Test averages compared to physicians
- In Knowledge and practice strategy, physicians had stronger improvements and higher Pre- and Post-Test averages, compared to advanced practice nurses

4-Week Retention Analysis

By Learning Domain

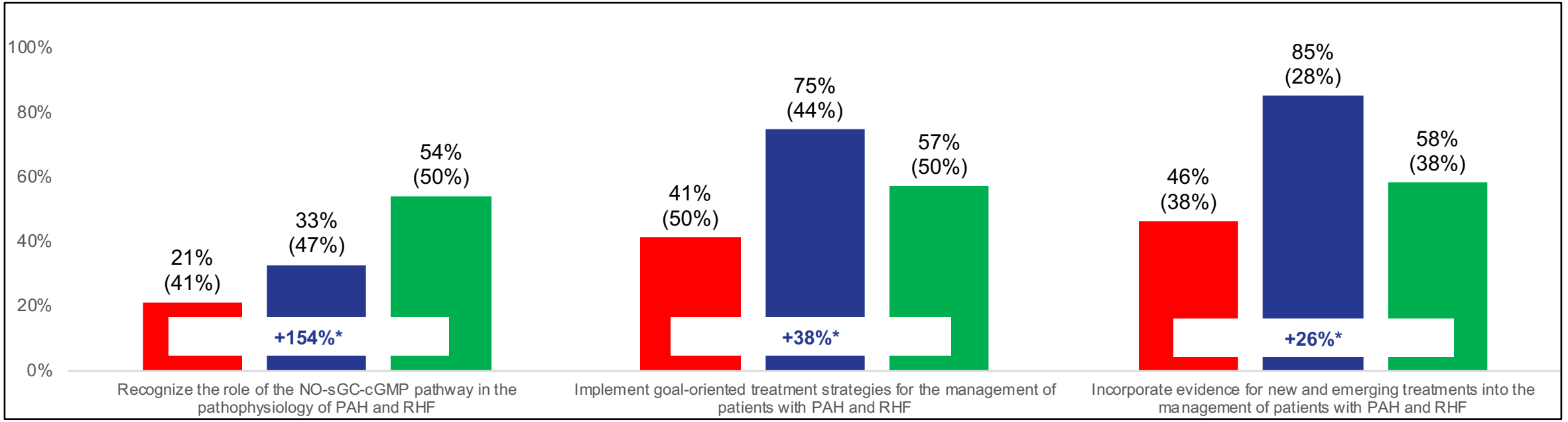


- Four to six weeks following their engagement in the curriculum, learners were prompted to complete a brief Post Curriculum Assessment (PCA), which repeated items from each of the four curriculum learning domains
- In each of the four domains, substantial and significant net gains were achieved from Pre-Test to PCA measurements
  - Despite these gains, some score slippage was seen from Post-Test to PCA in all domains

4-Week Retention Analysis

By Learning Objective

N = 61 – 67 Matched responses



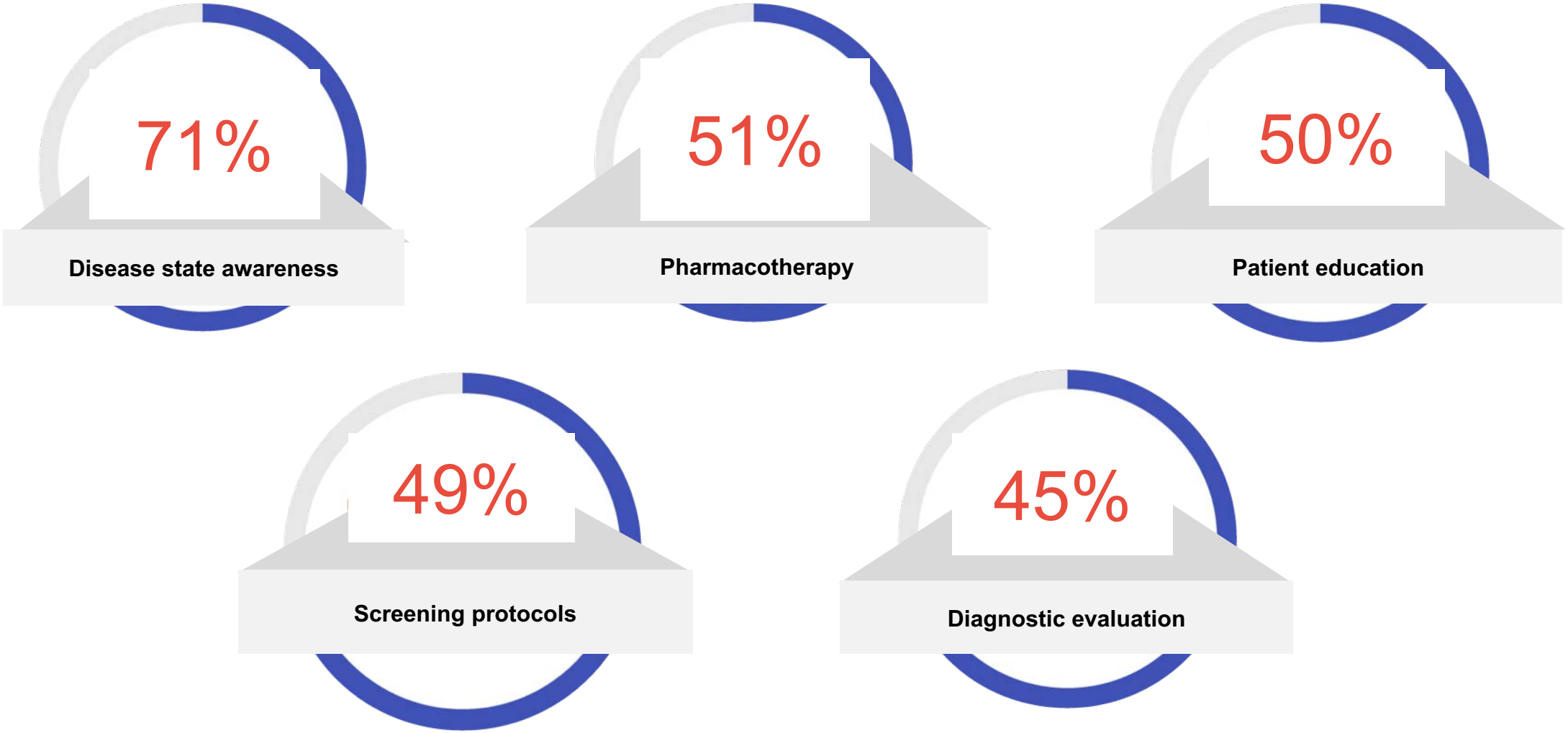
- When examining results by Learning Objective, substantial and significant net gains were achieved from Pre-Test to PCA measurements on each of the three Objectives, with some score slippage from Post-Test to follow-up
- The strongest gains, from the lowest Pre-Test scores, were measured in recognizing the role of the NO-sGC-cGMP pathway in the pathophysiology of PAH and RHF
    - Scores in this are increased substantially from Post-Test to follow-up, driven by an item on the mechanism of action of riociguat
- On the other two Objectives, some slippage in score from Post-Test to PCA measurements was seen

* 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.)

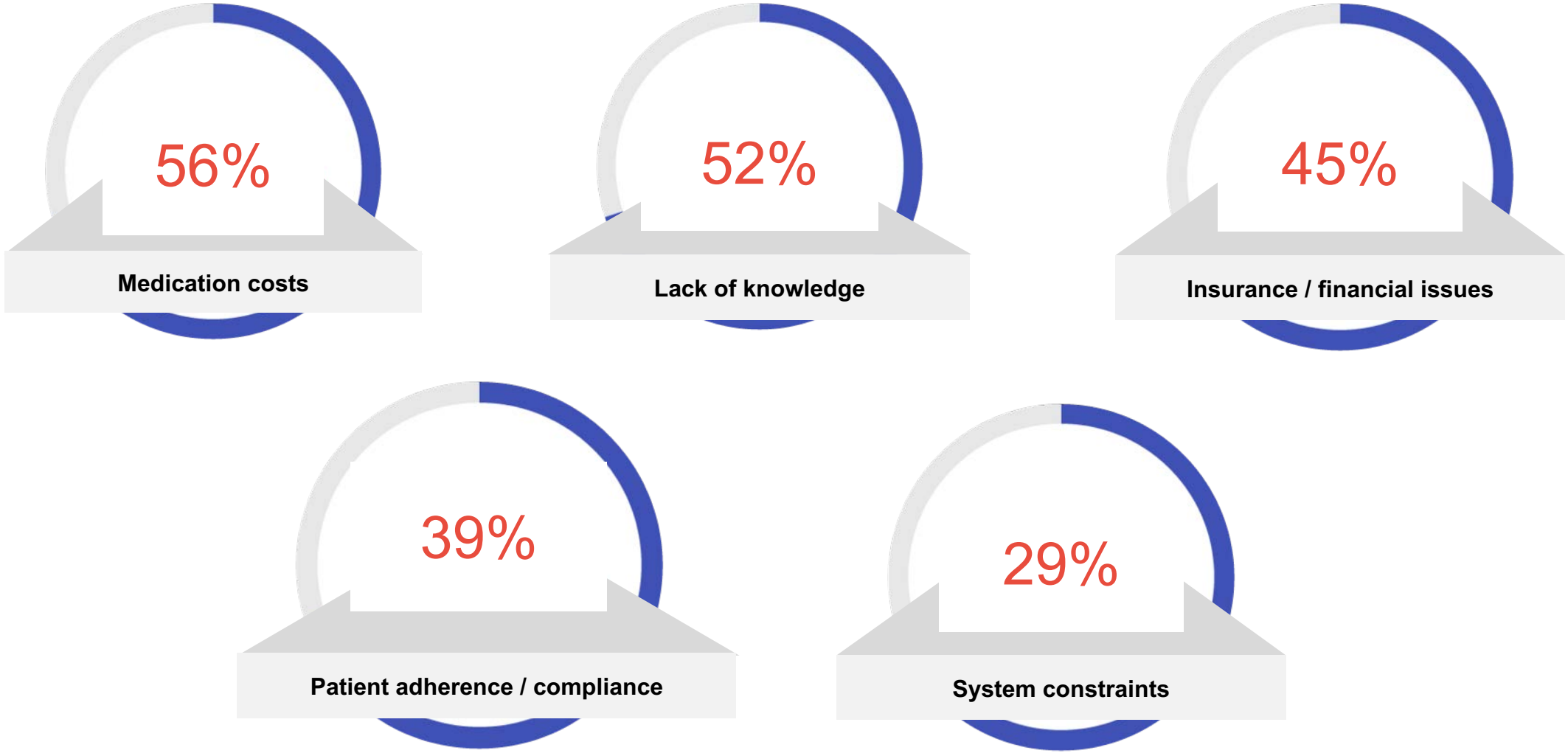
N = 132



(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 = 132



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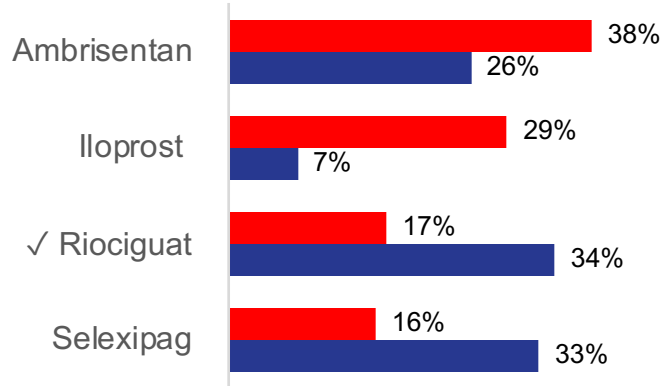
Identified Learning Gap:
Mechanism of action of approved PAH therapies

Despite improvements in score on a Knowledge asking learners to select the PAH treatment agent corresponding to a given mechanism, low Post-Test scores identify this as an opportunity for further education.

Which of the following agents approved for the treatment of PAH acts by potentiating the vasodilatory activity of nitric oxide through stimulation of soluble guanylate cyclase?

Results:

- At Post-Test, 62% of learners correctly answered: “Riociguat”



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 in Competence and Confidence, and higher for physicians in Knowledge and practice strategy
    - These gains were seen across all individual Knowledge and Competence items, with improvements ranging from 39% to 155%
- Significant improvements ranging from 83% to 127% were measured across all Learning Objectives, with all Post-Test scores between 34% and 87%
- Strongest gains, and highest Post-Test scores (90%) were measured on a Competence item on selecting a combination therapy as a first-line treatment for a patient newly diagnosed with PAH
- The analysis of the Knowledge and Competence domains identified an **opportunity for further education in the management of patients with PAH**
    - Despite improvements in score on a Knowledge asking learners to select the PAH treatment agent corresponding to a given mechanism, low Post-Test scores identify **mechanism of action of approved PAH therapies** as an opportunity for further education
    - Notably, though very low Post-Test scores were measured on this item (34%), learners continued to improve by the follow-up assessment (54%)

Appendix

Slides 24 – 26: Pre-Test to Post-Test matched item responses

Slides 27 – 29: 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

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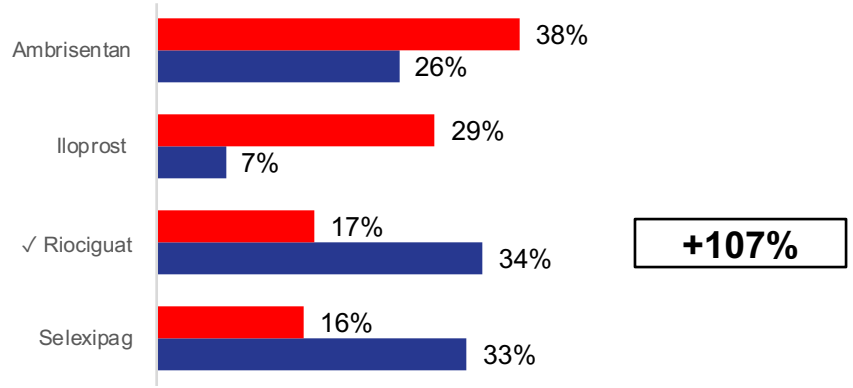
Knowledge Items

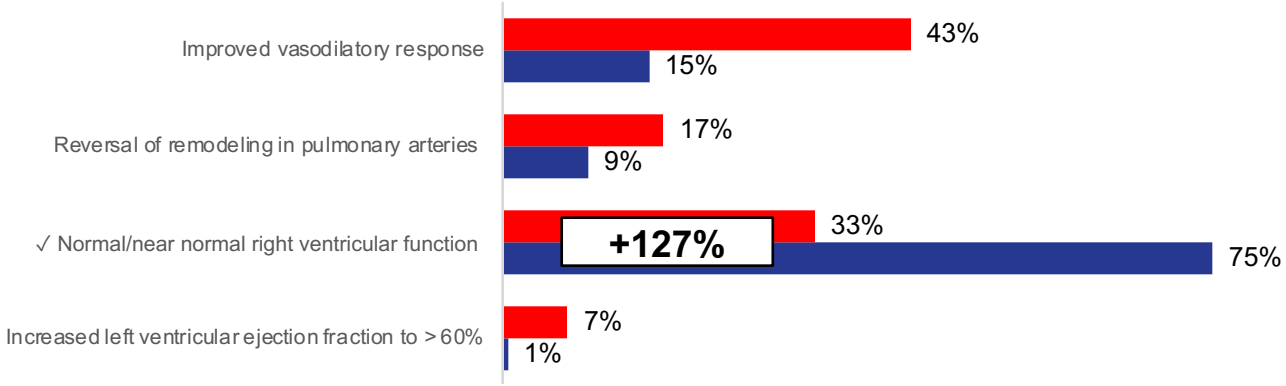
Which of the following agents approved for the treatment of PAH acts by potentiating the vasodilatory activity of nitric oxide through stimulation of soluble guanylate cyclase?

N = 180 Matched responses



Which of the following is a recommended goal of treatment for patients with PAH?

N = 188 Matched responses



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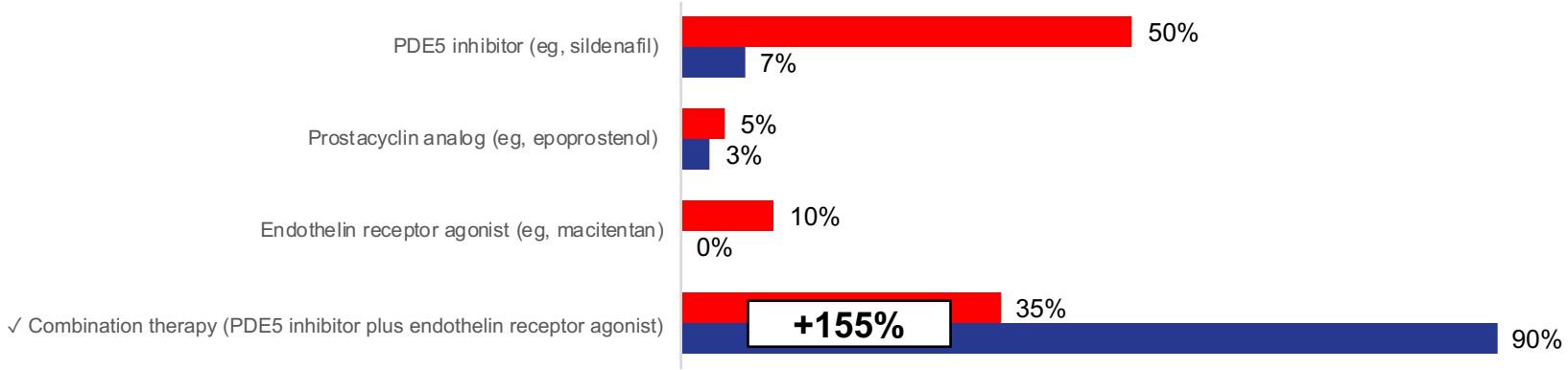
Competence Items

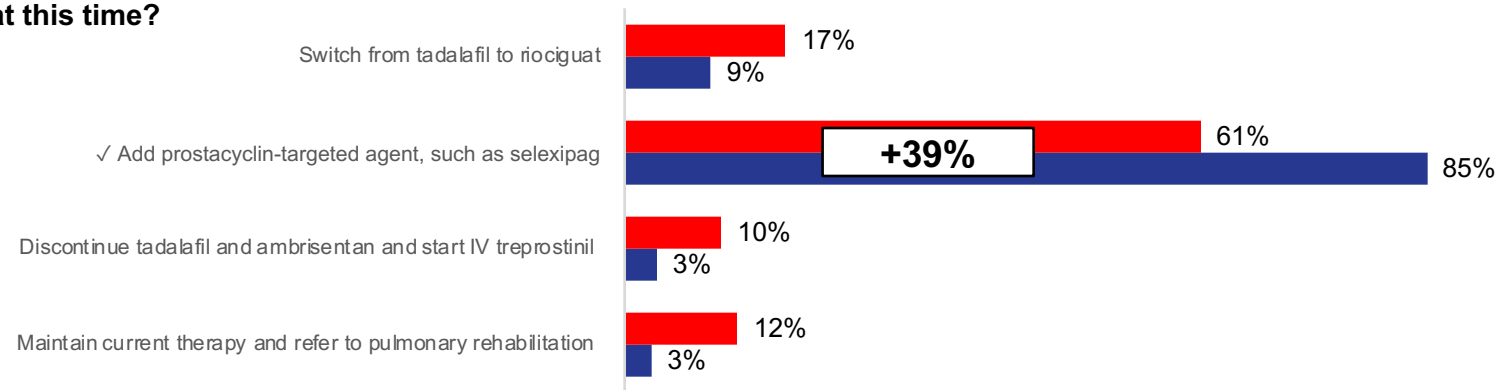
62 y/o man presents with progressive dyspnea on exertion. Workup identifies elevated pulmonary artery pressures and right ventricular dilatation; no clinical evidence of right heart failure; right heart catheterization confirms PAH with no vasodilator response. Risk estimate: Intermediate. Which of the following therapies would be an evidence-based choice for first-line therapy in this patient?

N = 185 Matched responses



56 y/o woman diagnosed with PAH is treated with tadalafil and ambrisentan. Initial risk estimate on dual oral therapy: Low. After 6 months of treatment, patient reports worsening symptoms of dyspnea and rising BNP level. Revised risk estimate: Intermediate. Which of the following would be appropriate at this time?

N = 176 Matched responses



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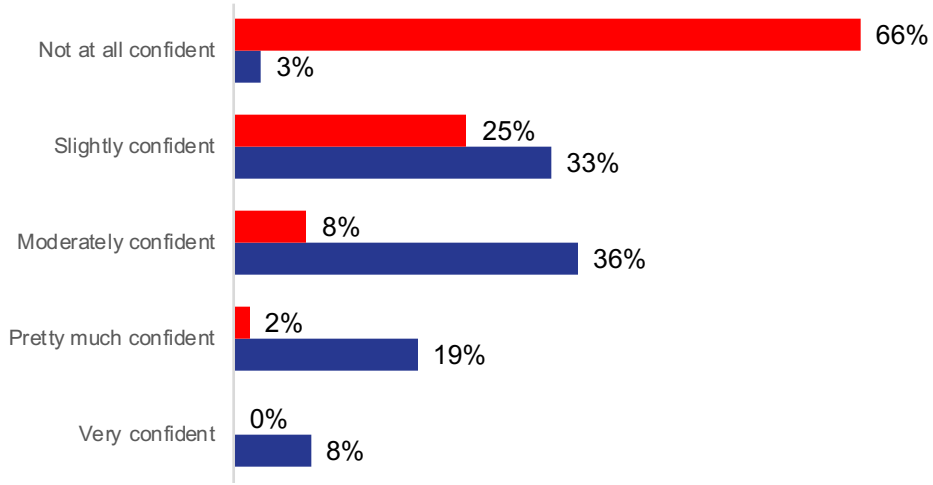
Confidence and Practice Strategy Items

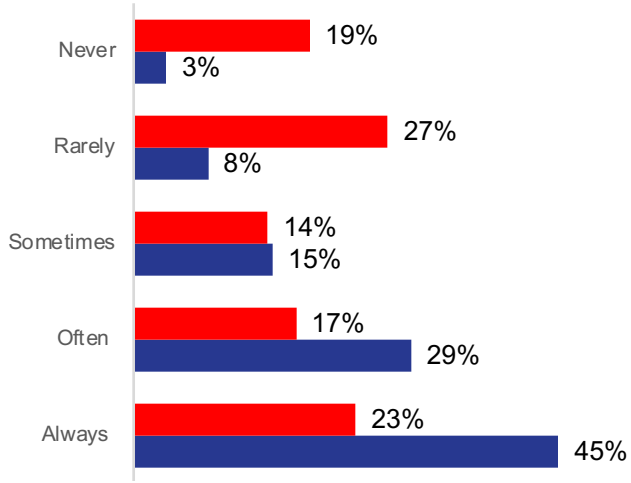
How confident are you in your ability to select therapy for PAH based on a patient's risk level?

N = 248 Matched responses



How often do you assess risk level in patients with PAH?

N = 205 Matched responses



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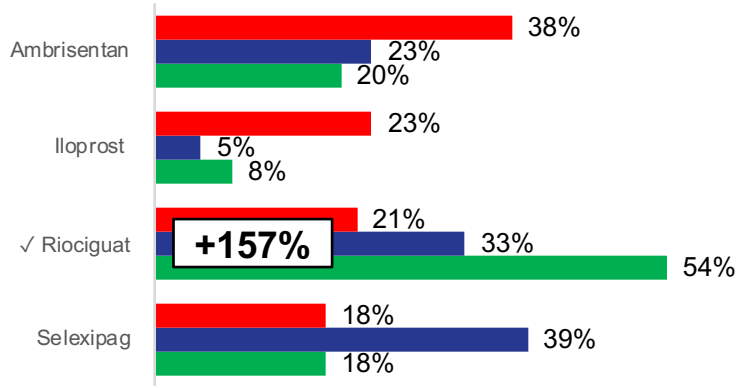
Knowledge Items

Post Curriculum Assessment (PCA)

Pre-Test
Post-Test
PCA

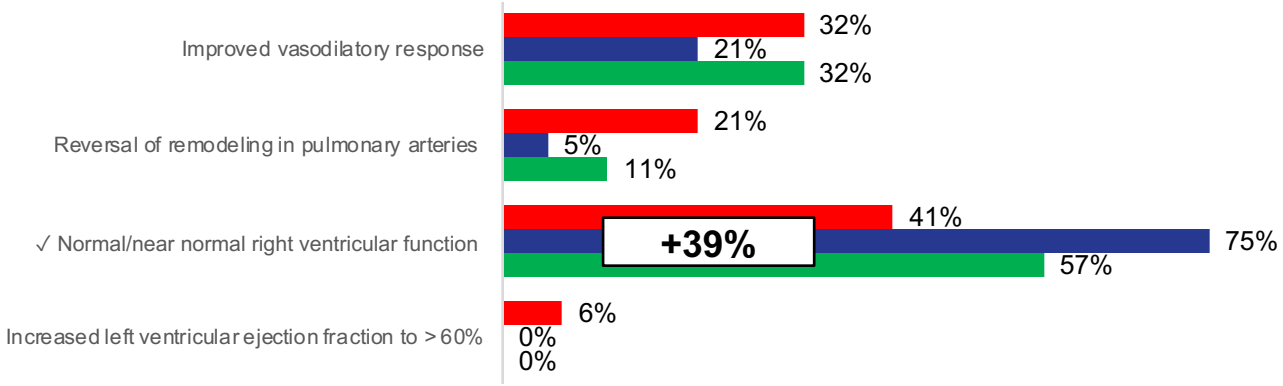
Which of the following agents approved for the treatment of PAH acts by potentiating the vasodilatory activity of nitric oxide through stimulation of soluble guanylate cyclase?

N = 61



Which of the following is a recommended goal of treatment for patients with PAH?

N = 63



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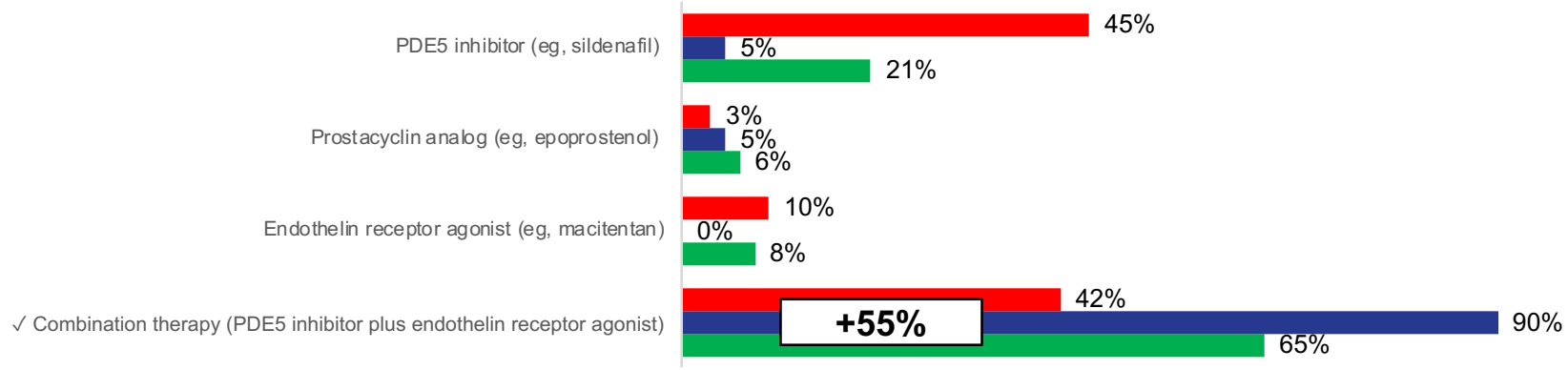
Competence Items

Post Curriculum Assessment (PCA)

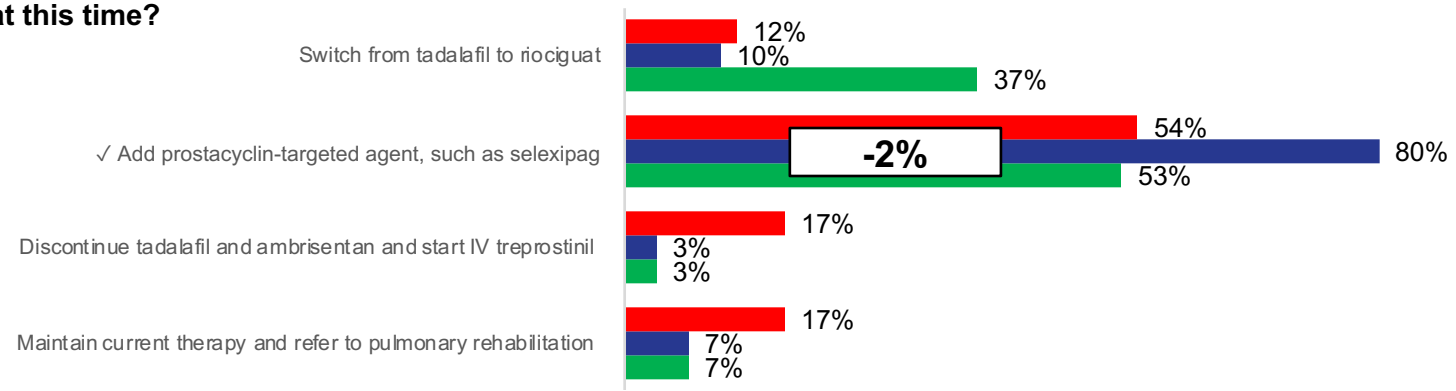
62 y/o man presents with progressive dyspnea on exertion. Workup identifies elevated pulmonary artery pressures and right ventricular dilatation; no clinical evidence of right heart failure; right heart catheterization confirms PAH with no vasodilator response. Risk estimate: Intermediate. Which of the following therapies would be an evidence-based choice for first-line therapy in this patient?

N = 62 Matched responses



56 y/o woman diagnosed with PAH is treated with tadalafil and ambrisentan. Initial risk estimate on dual oral therapy: Low. After 6 months of treatment, patient reports worsening symptoms of dyspnea and rising BNP level. Revised risk estimate: Intermediate. Which of the following would be appropriate at this time?

N = 59 Matched responses



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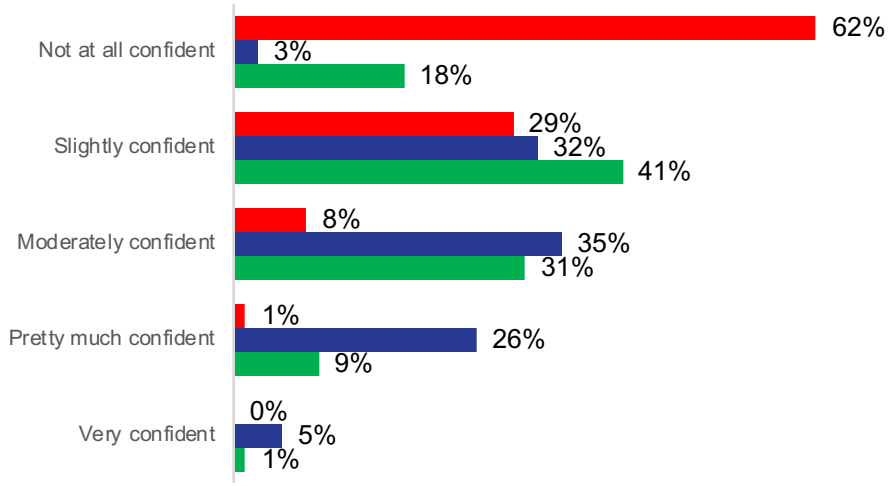
Confidence and Practice Strategy Items

Post Curriculum Assessment (PCA)

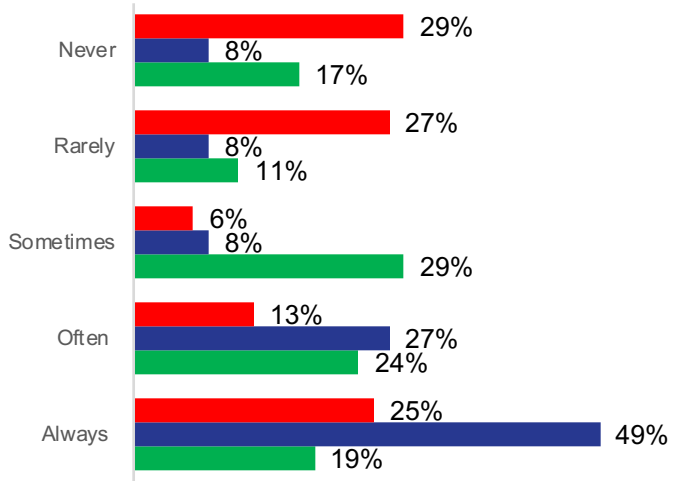
How confident are you in your ability to select therapy for PAH based on a patient's risk level?

N = 78 Matched responses



How often do you assess risk level in patients with PAH?

N = 63 Matched responses



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