

Clinical Updates for Nurse Practitioners and Physician Assistants
**Recognizing Phenotypes and Evidence- Based
Treatments in the Management of Heart Failure**



**The Association of Black Cardiologists (ABC)
The National Association for Continuing Education (NACE)**

Final Live Activity Outcomes Report • March 16, 2018

Novartis Pharmaceuticals Grant: NGC31462

Executive Summary - Quantitative Impact

Participants

1,756

Participants

80%

NPs and PAs

Who together see an average of

68,867

patients weekly

Which translates to an average of

3,581,063

patient visits annually

Results

Knowledge and Competence

Increased proficiency to:

Recognize the different phenotypic presentations of HF **by 109%**

Identify predictors of poor outcomes in HF **by 182%**

Discuss the role of new therapies in the management of chronic HF according to the latest ACC/AHA/HFSA/ADA guidelines **by 101%**

Recognize strategies to reduce hospitalization for HF **by 74%**

Future Education

Although gains were retained at follow-up, the score slippage suggests that future activities should continue to target all Learning Objectives to reinforce the gains achieved in the current curriculum and further increase participants' proficiency.

Executive Summary - Educational Impact

- This curriculum consisted of 10 live meetings and 3 simulcast events focused on the management of heart failure for Nurse Practitioners and Physician Assistants.
 - The curriculum was successful at reaching its target audience.
- Significant gains from low Pre-Test scores were measured on all Learning Objectives and in all learning domains.
 - High Post-Test averages were achieved in Knowledge, Competence, and practice strategy.
 - Analysis of learning retention in the PCA showed that, despite a small sample size, significant net gains were measured from Pre-Test in Knowledge, Competence, and Confidence. Score decreases from Post-Test to the PCA were due to comparable levels of score slippage on all questions.
 - These findings highlight the success of the curriculum at targeting an area of educational need, but indicate that participants would benefit from further education that reinforces the gains achieved in this curriculum.
- Cohort comparisons were conducted to analyze differences in proficiency:
 - 1. Among participants at the different meeting/simulcast locations**
 - 2. Comparing participants in the live meetings to simulcast participants**
 - 3. Among professions (NPs, PA, and physicians)**
 - Among the notable differences were greater score gains from lower Pre-Test averages in meeting participants compared to simulcast participants, and in NPs and PAs, compared to physicians. The result of these greater improvements were Post-Test averages that neared or surpassed the Post-Test scores of the initially more proficient cohort.

Curriculum Overview

1. **Accredited Live Regional Symposium**

- Launch Date: September 16, 2017 through December 7, 2017
- Presented in 10 cities with simulcasts in 3 cities.

2. **Enduring CME Monograph**, Launch Date: December 15, 2018 End Date: December 14, 2019

- http://naceonline.com/CME-Courses/course_info.php?course_id=932

3. **Non-Accredited *Clinical Highlights* monograph** containing key teaching points from the activity was distributed within 1 week after each live symposium.

Outcomes Analysis

Outcomes Metrics Used

Learning outcomes were measured using matched Pre-Test and Post-Test scores for four learning domains (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 differences 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; significance of drivers in predictive modeling
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, Post-Test, and PCA 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, Post-Test, and PCA 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, Post-Test, and PCA score averages

Participation

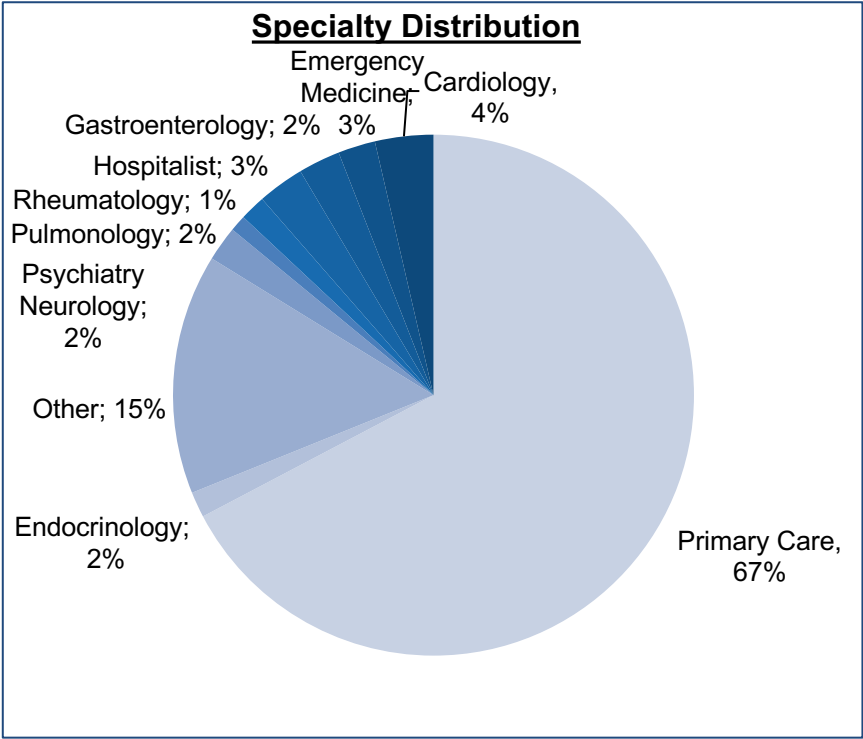
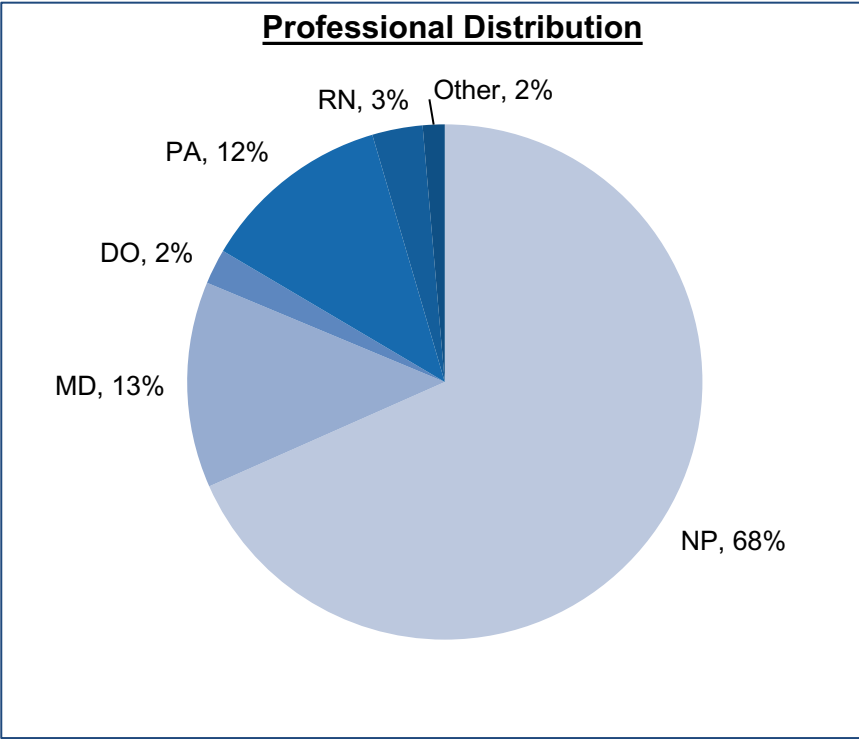
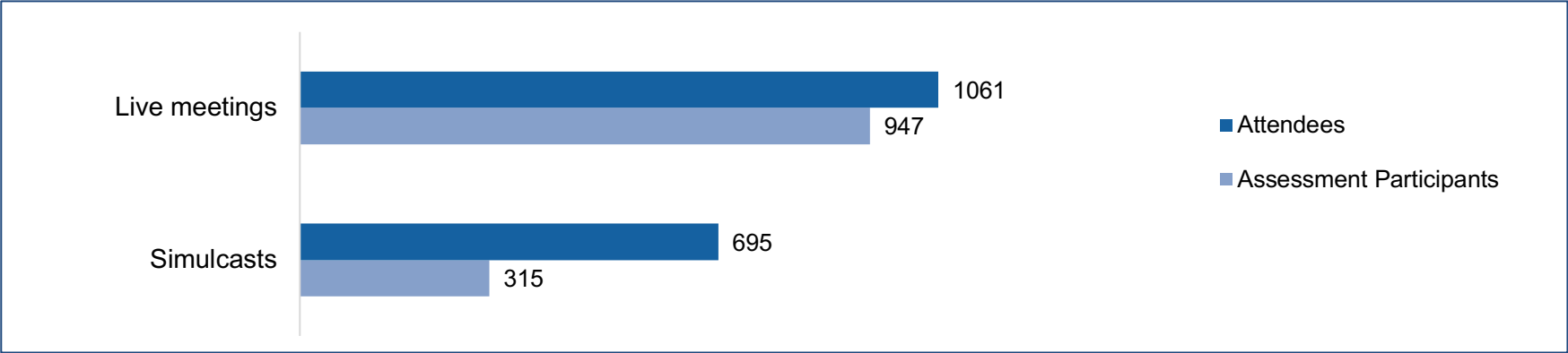
#	Meeting/Simulcast Location (Date)	Attendees	Assessment Participants	Participation Rate
1	Orlando Live Meeting (9/16/2017)	148	132	89%
2	Cincinnati Live Meeting (9/23/2017)	56	56	100%
3	Seattle Live Meeting (10/7/2017)	74	67	90%
4	Philadelphia Live Meeting (10/14/2017)	57	52	91%
5	Philadelphia Simulcast (10/14/2017)	209	83	39%
6	Dallas Live Meeting (10/21/2017)	202	185	92%
7	Miami Live Meeting (10/28/2017)	131	112	85%
8	Charlotte Live Meeting (11/4/2017)	107	96	89%
9	Phoenix Live Meeting (11/11/2017)	123	108	88%
10	Phoenix Simulcast (11/11/2017)	259	130	51%
11	White Plains Live Meeting (11/18/2017)	90	78	87%
12	White Plains Simulcast (11/18/2017)	227	102	45%
13	Costa Mesa Live Meeting (12/2/2017)	73	60	82%
Total		1756	1262	72%

Attendee: Registrants

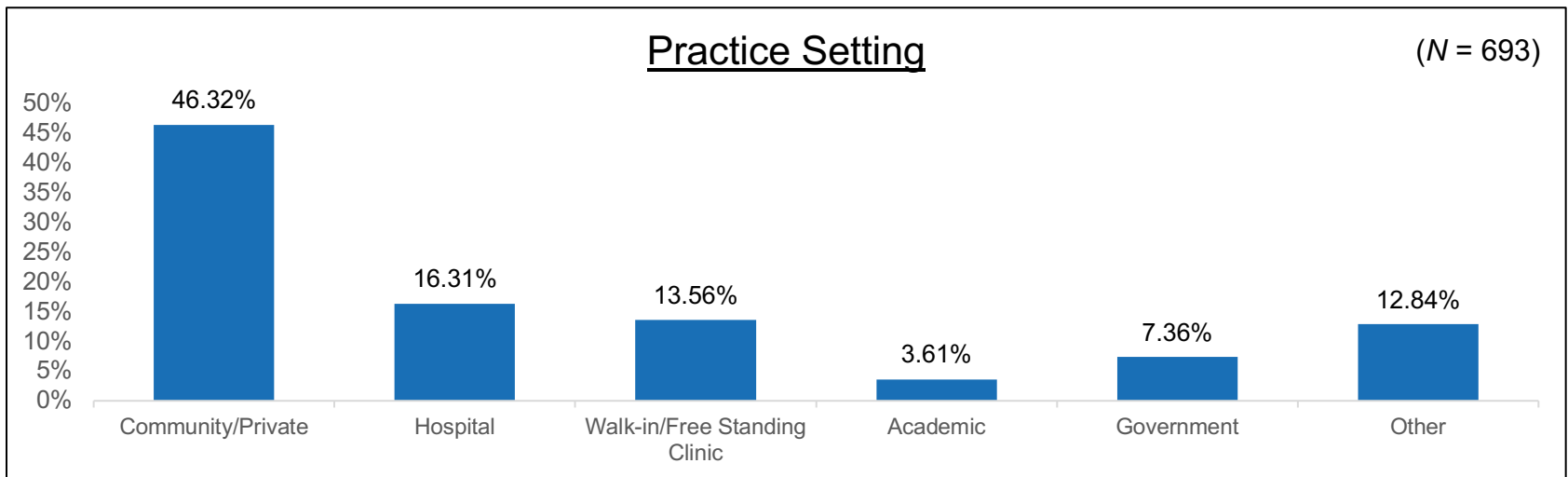
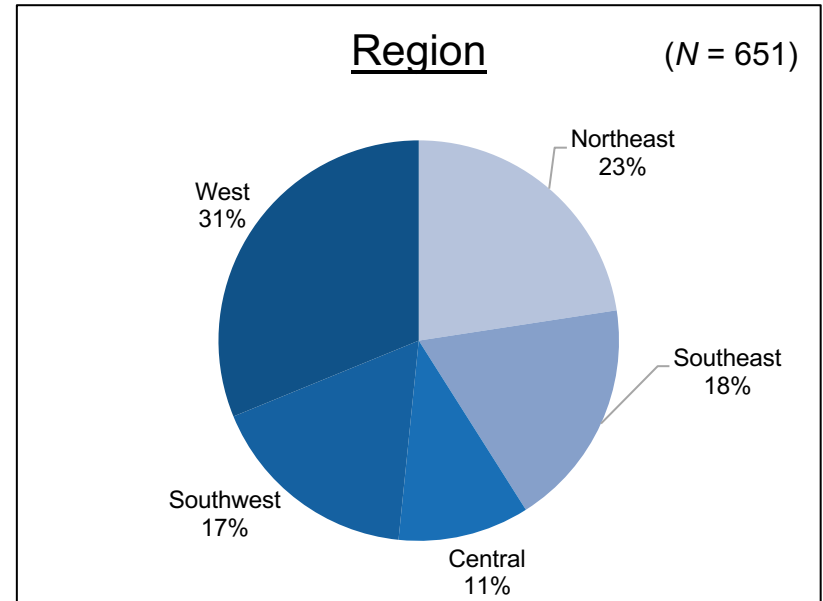
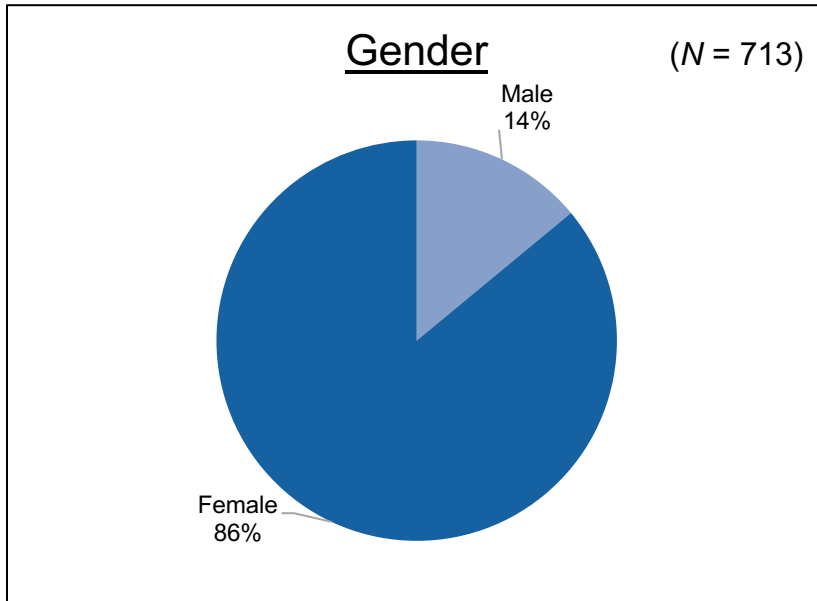
Assessment Participant: Answered any Pre-Test or Post-Test question

Population Summary

Total Participation Measured
Attendees: 1756 Assessment Participants: 1262



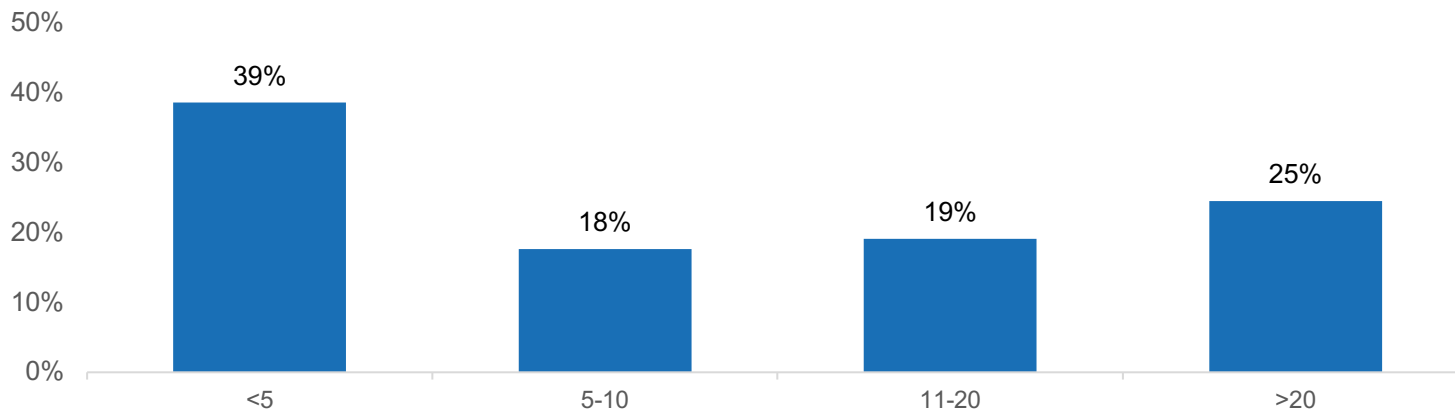
Learner Demographics



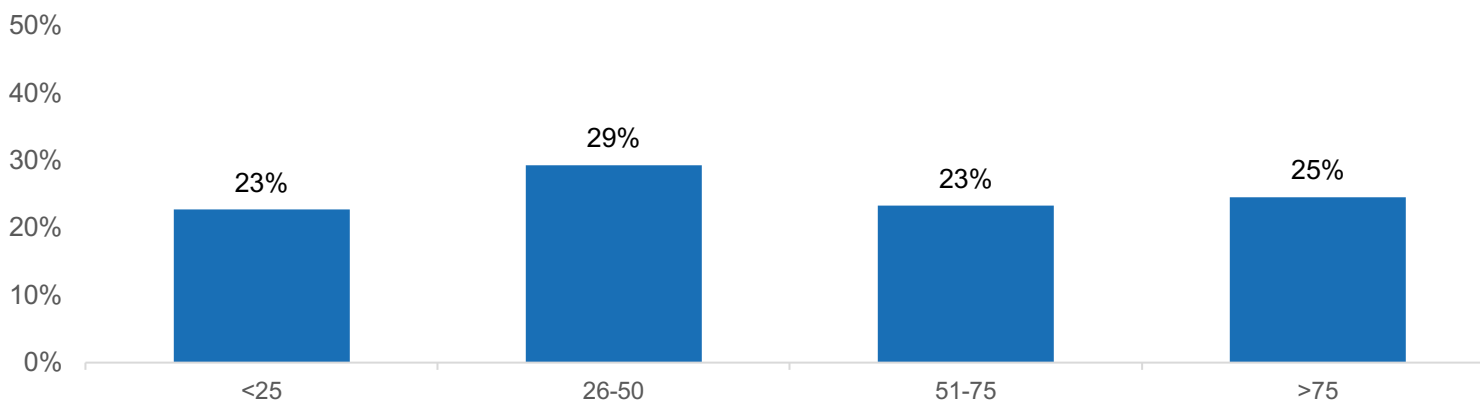
Learner Demographics (Cont.)

Years in Practice

(N = 737)

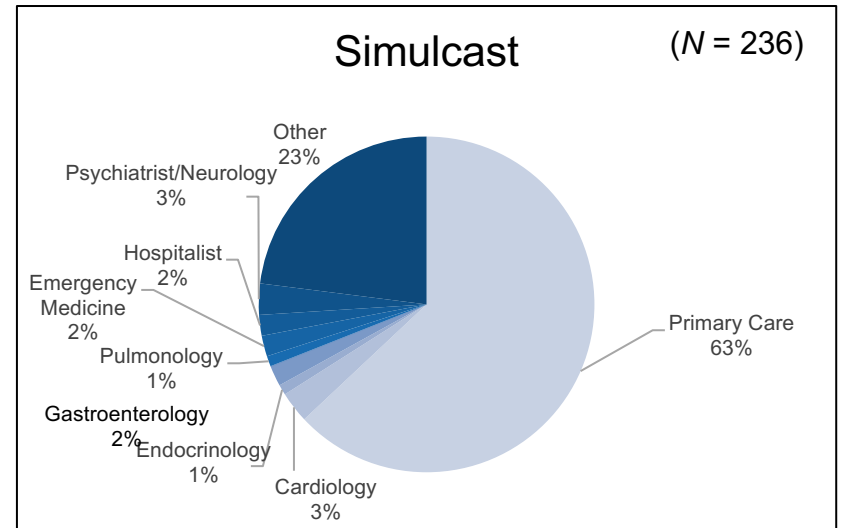
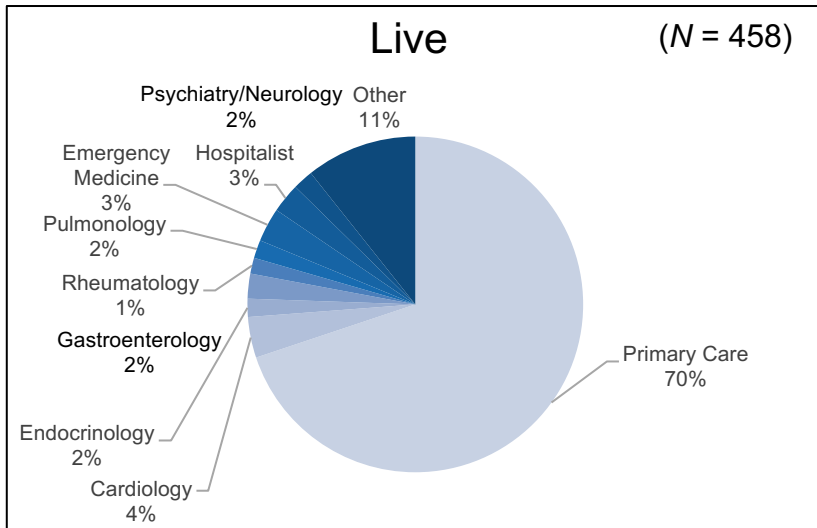


Number of patients you personally see each week, in any clinical setting? (N = 712)

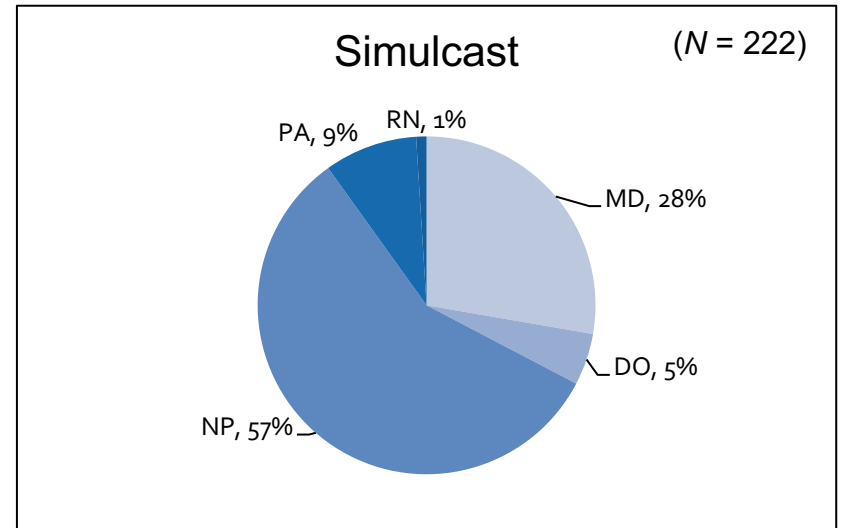
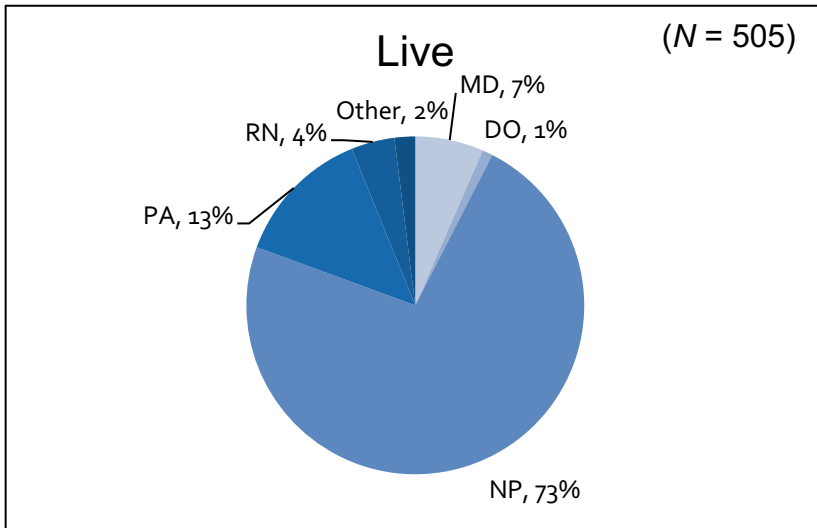


Live vs. Simulcast Demographics

Specialty

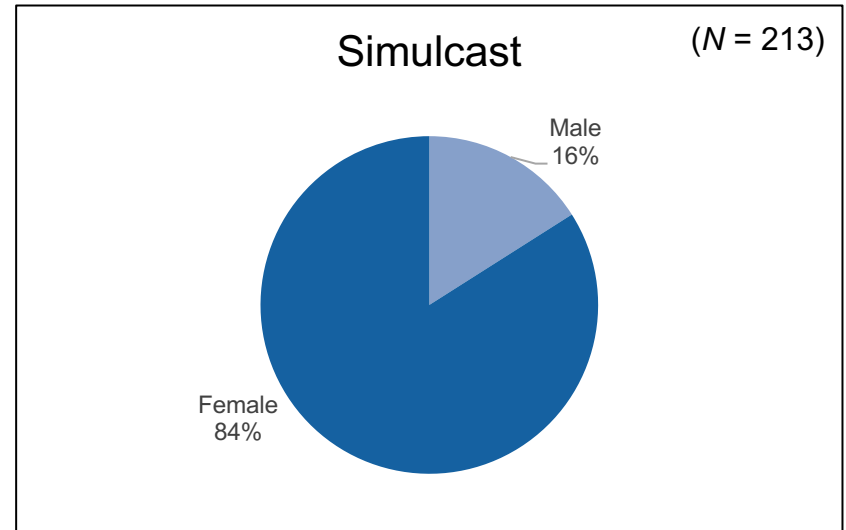
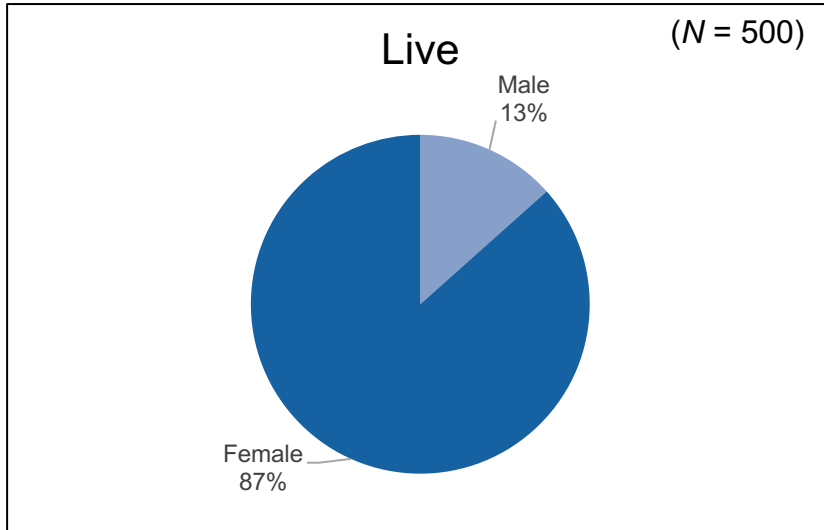


Profession

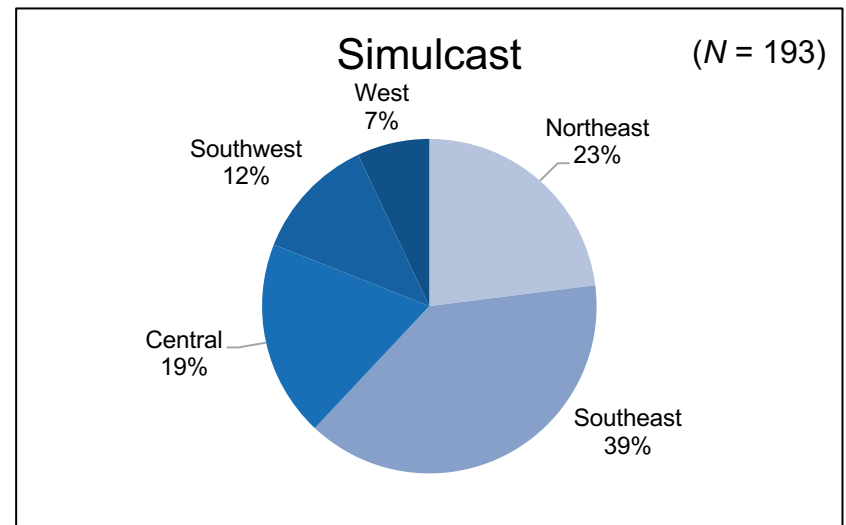
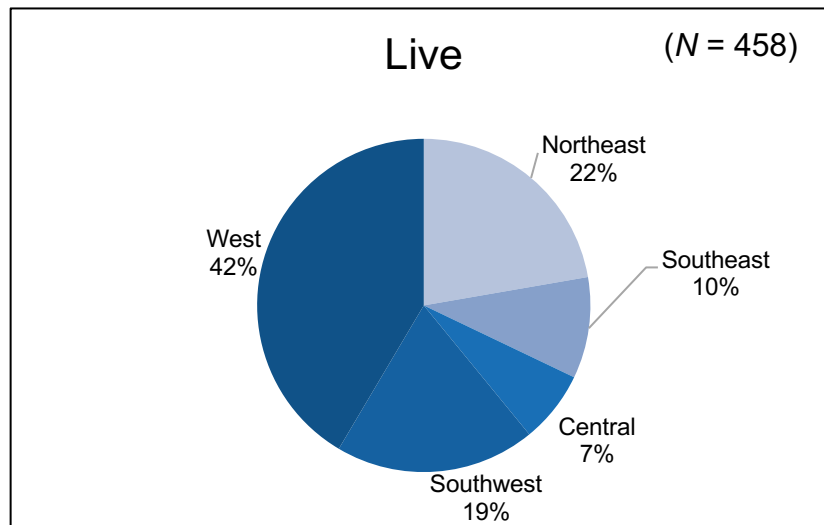


Live vs. Simulcast Demographics

Gender

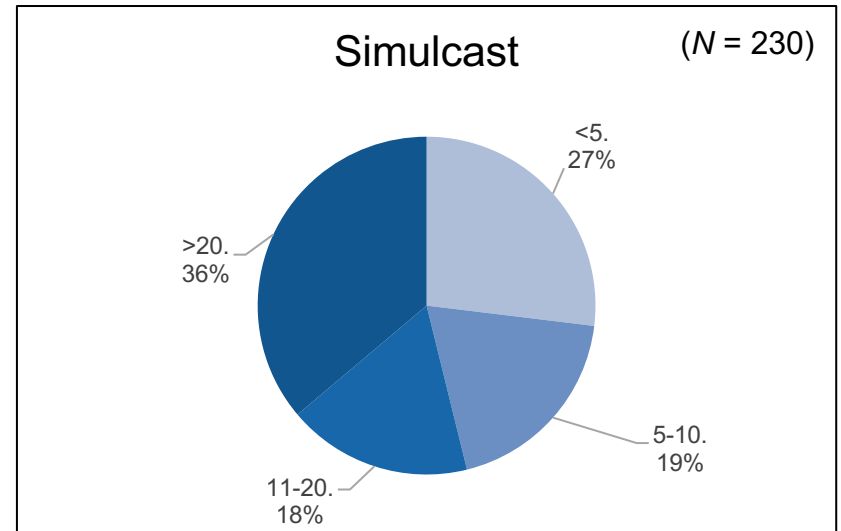
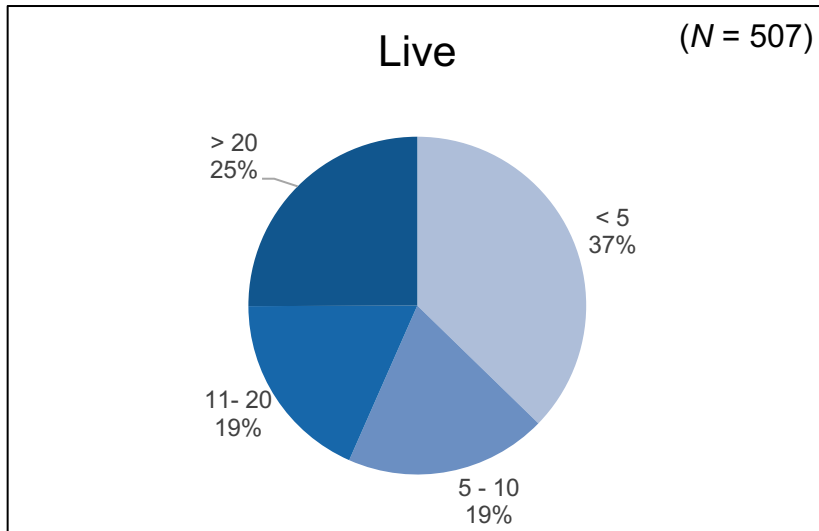


Region

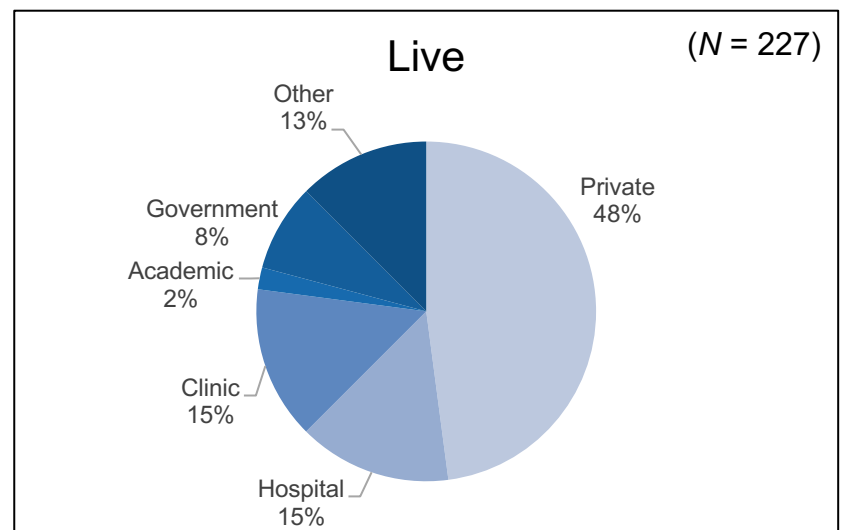
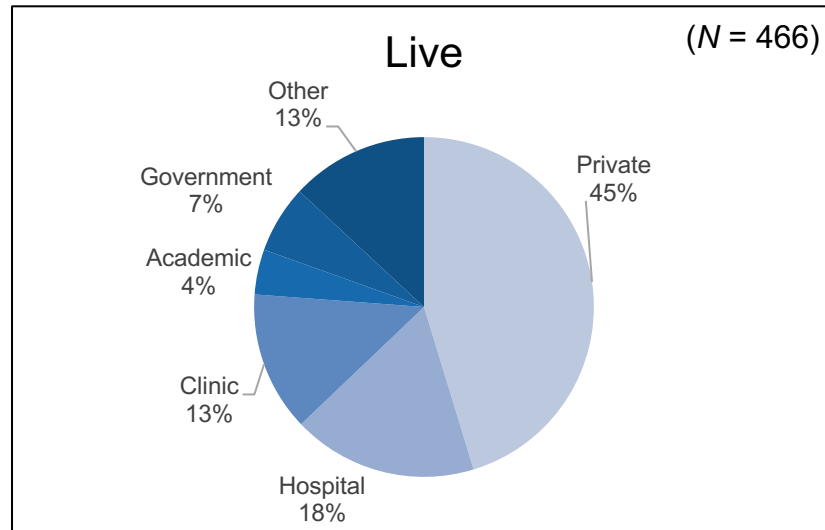


Live vs. Simulcast Demographics

Years in Practice

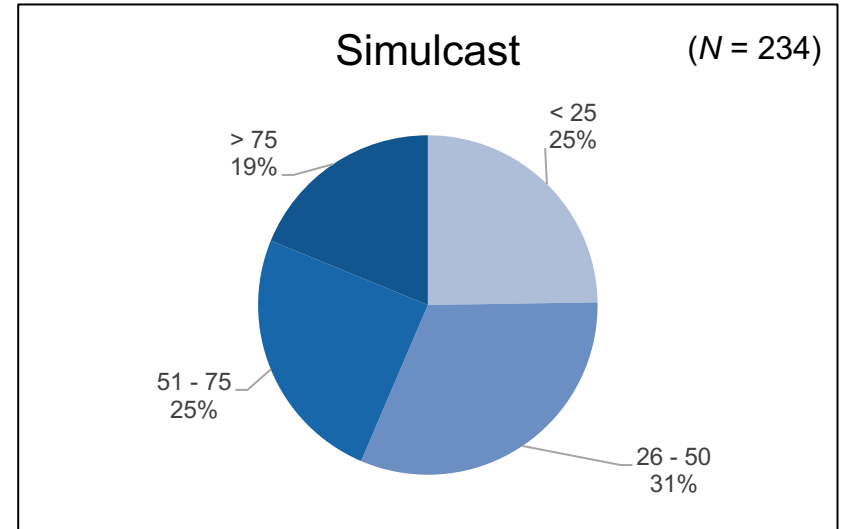
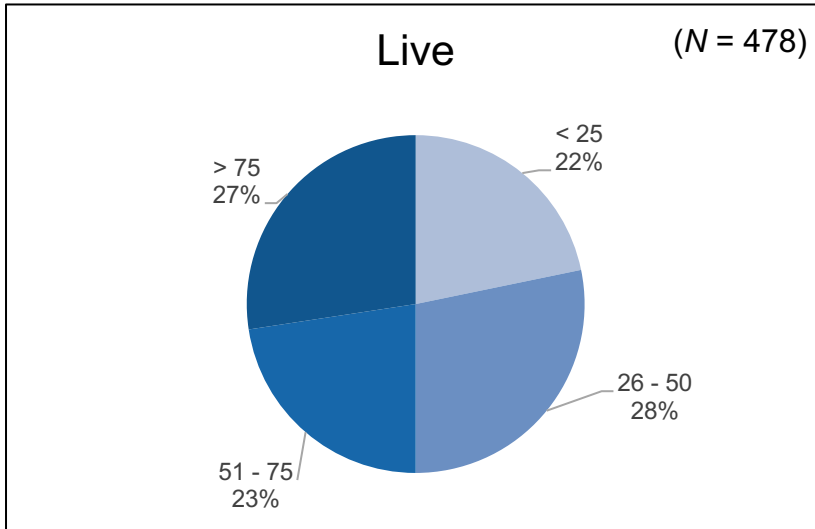


Practice Setting

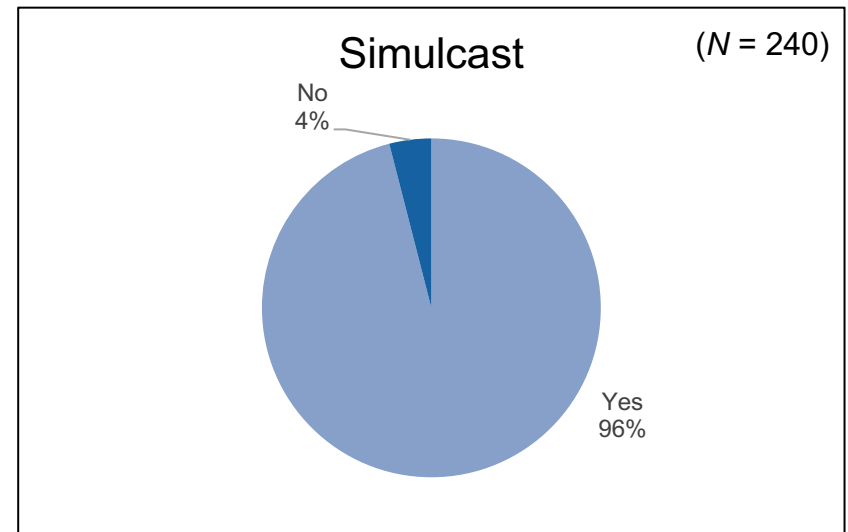
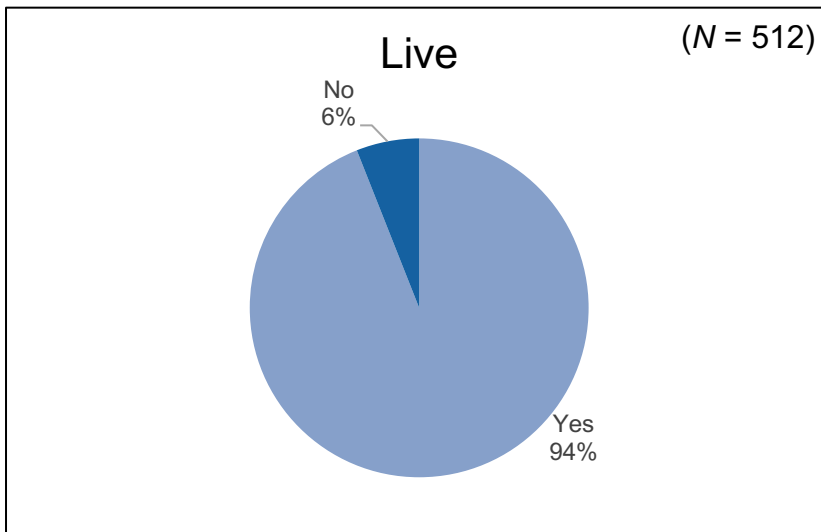


Live vs. Simulcast Demographics

Patients Seen per Week



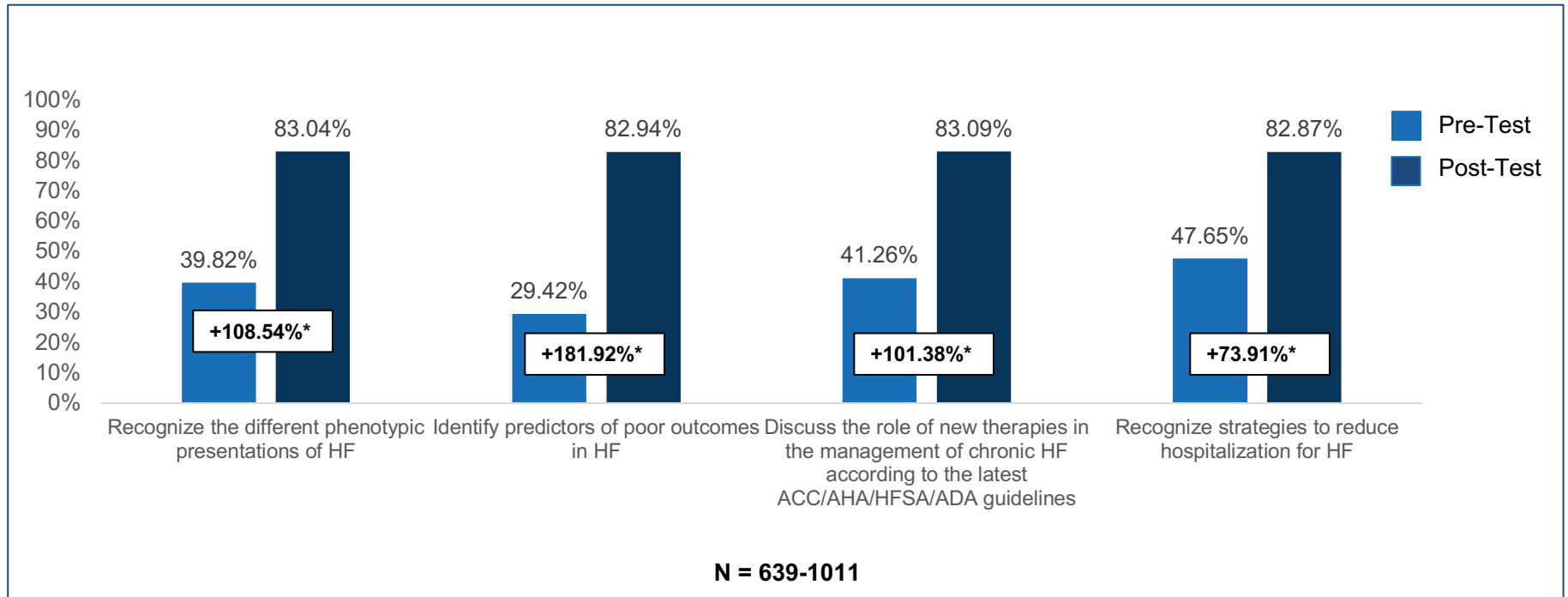
Is Your Practice Mainly Devoted to Patient Care?



Quantitative Analyses - Learning Objectives

- Substantial significant gains (ranging from 74% to 182%) were achieved on all four of the curriculum's Learning Objectives.
- Very low Pre-Test averages (< 48%) were demonstrated on all Learning Objectives. However, because of the gains, Post-Test averages were high (above 80%) in all areas, highlighting the success of the curriculum in targeting an area of educational need.

Note. * indicates significance $p \leq .05$, matched data



Learning Objectives - Live vs. Simulcast Audience

Note. * indicates significance $p \leq .05$, matched data

Learning Objective	Live Meeting (N = 481-799)			Simulcast (N = 151-210)		
	Pre-Test	Post-Test	% Change	Pre-Test	Post-Test	% Change
Recognize the different phenotypic presentations of HF	39.28%	83.30%	112.07%*	41.72%	82.12%	96.84%*
Identify predictors of poor outcomes in HF	27.30%	84.30%	208.79%*	36.02%	77.64%	115.55%*
Discuss the role of new therapies in the management of chronic HF according to the latest ACC/AHA/HFSA/ADA guidelines	39.90%	82.89%	107.74%*	46.50%	83.85%	80.32%*
Recognize strategies to reduce hospitalization for HF	46.27%	83.45%	80.35%*	52.42%	80.52%	53.61%*

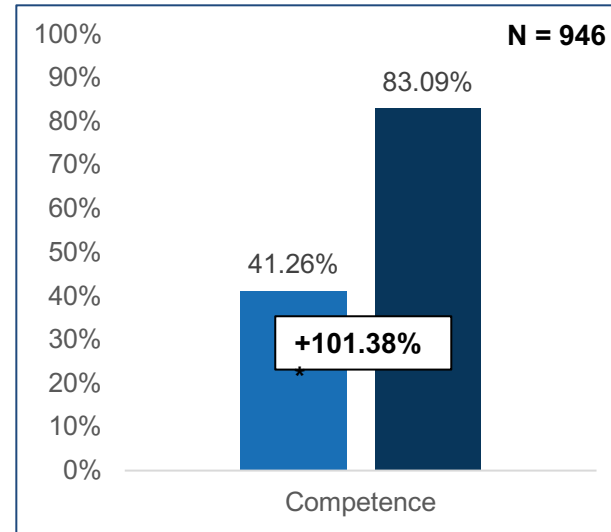
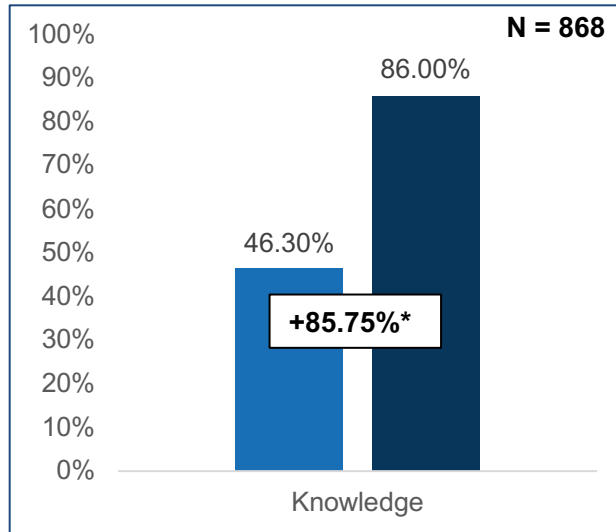
- Substantial significant gains on the Learning Objectives were achieved by participants in the live meetings and in the simulcasts. Gains ranged from 54% to 209%.
- Pre-Test averages of simulcast participants were modestly higher than those of participants in the live meetings. However, due to the greater gains achieved by participants in the live meetings, Post-Test averages were comparable.

Quantitative Analyses - Learning Domains and Item-Level Analysis

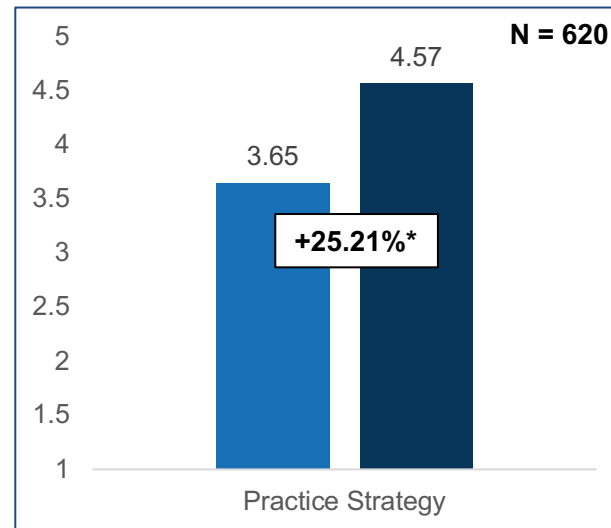
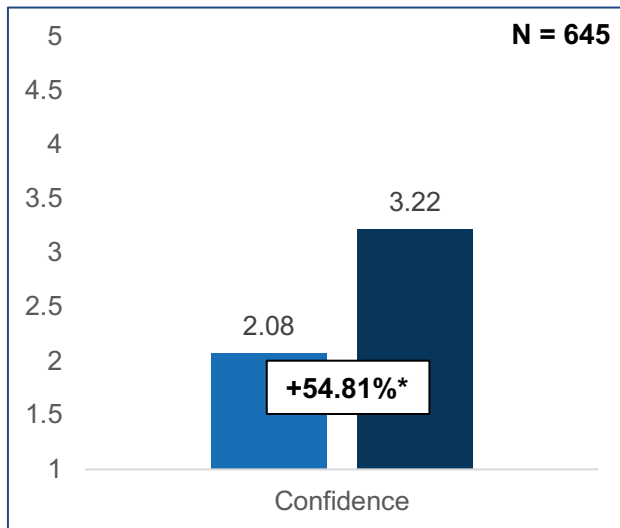
- When proficiency was evaluated at the domain level, participants demonstrated substantial significant improvements on all learning domains. High Post-Test averages were measured in Knowledge and Competence (>80%), and in practice strategy (>4.0 out of 5 on a 5-point Likert scale). The item level analysis of all assessment questions (see Appendix) revealed that learners achieved a high level of proficiency on all questions with comparable Post-Test scores (83%-89%) on all Knowledge and Competence questions, with the exception of the one question related to echocardiogram ejection levels that indicate HFrEF (73%).
- Cohort analyses were conducted comparing:
 - 1. Participants at each of the different meetings/simulcasts**
 - All participant groups demonstrated significant gains. However, notable Post-Test score differences included participants in the White Plains simulcast who achieved the lowest Post-Test Knowledge score. The Competence domain showed the greatest variance, with Post-Test scores ranging from 63% (Orlando live meeting) to 95% (Charlotte live meeting). Much less score variance was observed on the Confidence and practice strategy ratings.
 - 2. Participants in the live meetings and simulcasts**
 - When participants were separated based on whether they participated in a live meeting vs a simulcast, comparable scores were measured in Competence, Confidence, and practice strategy. The exception was the Knowledge domain in which live meeting participants demonstrated a moderately higher Post-Test average.
 - 3. Professional groups (NPs, PAs, and physicians)**
 - Physicians demonstrated the highest Pre-Test averages; however, due to the greater gains of NPs and PAs, their Post-Test averages surpassed or neared that of physicians.
- An analysis of learning retention in the Post-Curriculum Assessment showed that significant net gains from Pre-Test were measured in all learning domains. However, score decreases did occur from Post-Test to the PCA in all domains. An item level analysis of the PCA revealed that this decrease was caused by comparable levels of score slippage on each of the questions asked.

Learning Domains

Note. * indicates significance $p \leq .05$, matched data



Pre-Test
Post-Test



Curriculum/Activity Effect

Domain	Effect Size*	% Non-Overlap (PND)	Power
Knowledge	1.099	58.73%	1.000
Competence	1.278	64.21%	1.000
Confidence	1.272	64.02%	1.000
Practice Strategy	0.955	53.89%	1.000

- Highlighting the magnitude of the percentage increases in all learning domains, large effect sizes (>1.0) were measured in all domains.
- In all domains, more than half of learners at Post-Test surpassed the highest Pre-Test averages.

*Effect Size: 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.

Learning Domains by Meeting/Simulcast Location

Location	Knowledge			Competence			Confidence			Practice		
	Pre-	Post-	% Change	Pre-	Post-	% Change	Pre-	Post-	% Change	Pre-	Post-	% Change
Orlando N=36-84	67.35	97.96	45.45%*	48.02	63.10	31.40%*	2.15	3.45	60.47%*	3.47	4.53	30.55%*
Cincinnati N=20-46	50.36	92.03	82.74%*	37.14	71.43	92.33%*	1.84	3.36	82.61%*	3.85	4.85	25.97%*
Seattle N=53-63	43.40	93.40	115.21%*	41.27	89.42	116.67%*	2.05	3.02	47.32%*	3.17	4.28	35.02%*
Philadelphia N=28-47	44.44	85.56	92.53%*	45.39	85.82	89.07%*	2.14	3.18	48.60%*	3.79	4.39	15.83%*
Philadelphia Simulcast N=23-53	46.86	80.19	71.13%*	59.18	76.53	29.32%*	1.80	2.87	59.44%*	3.57	4.35	21.85%*
Dallas N=110-166	46.54	84.90	82.42%*	36.35	80.72	122.06%*	2.14	3.45	61.21%*	3.88	4.72	21.65%*
Miami N=40-76	48.03	83.55	73.95%*	34.26	75.69	120.93%*	2.31	3.10	34.20%*	3.65	4.45	21.92%*
Charlotte N=68-71	45.59	98.53	116.12%*	63.33	94.84	49.76%*	1.70	3.48	104.71%*	2.65	4.62	74.34%*
Phoenix N=76-100	37.63	93.01	147.17%*	37.33	91.00	143.77%*	2.12	3.22	51.89%*	4.07	4.76	16.95%*
Phoenix Simulcast N=71-92	50.54	81.52	61.30%*	48.37	90.22	86.52%*	2.27	3.38	48.90%*	3.96	4.72	19.19%*
White Plains N=47-69	47.10	84.06	78.47%*	30.68	79.71	159.81%*	1.85	3.17	71.35%*	3.16	4.57	44.62%*
White Plains Simulcast N=35-50	42.67	76.00	78.11%*	35.71	75.51	111.45%*	2.2	3.26	48.18%*	3.57	4.08	14.29%*
Costa Mesa N=33-49	41.84	93.88	124.38%*	43.59	92.31	111.77%*	1.88	3.00	59.57%*	3.26	4.57	40.18%*

Note. * indicates significance $p \leq .05$, matched data

Learning Domains of Live vs. Simulcast Audience

Note. * indicates significance $p \leq .05$, matched data

	Live Meeting (N = 1,034)				Simulcast (N = 396)			
	N	Pre Test	Post Test	% Change	N	Pre Test	Post Test	% Change
Knowledge	677	45.49%	88.04%	+93.54%*	190	48.95%	78.68%	+60.74%*
Competence	751	39.90%	82.89%	+107.74%*	195	46.50%	83.85%	+80.32%*
Confidence	509	2.07	3.22	+55.56%*	136	2.15	3.24	+50.70%*
Practice	486	3.61	4.59	+27.15%*	134	3.78	4.48	+18.52%*

- Substantial significant gains were demonstrated by both live meeting and simulcast participants in all learning domains. Participants in the live meetings demonstrated lower Pre-Test averages, but greater gains.
- The greatest gains were measured in the Competence domain. Participants in the live meetings demonstrated the lower Pre-Test average (40%), but their greater gain resulted in a Post-Test average that was comparable to that of simulcast participants.

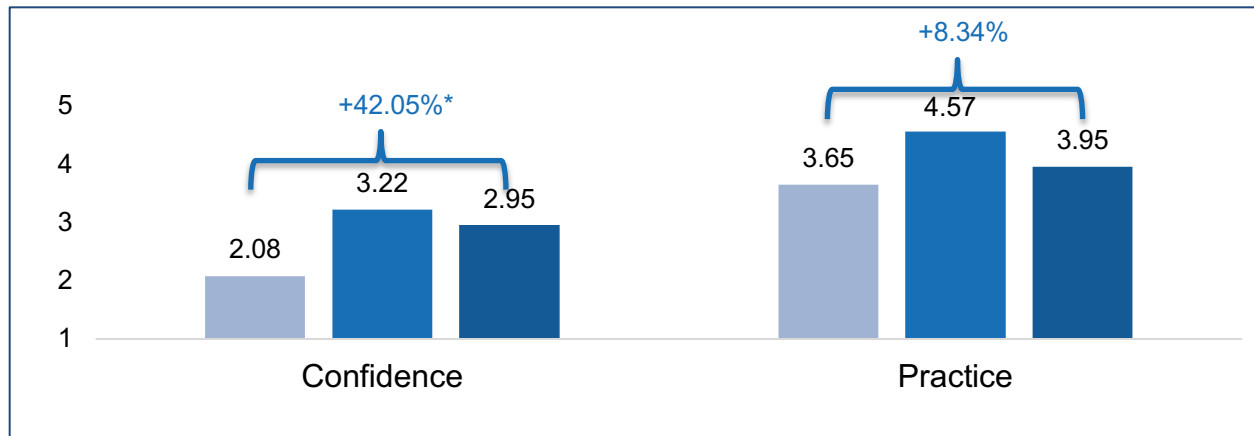
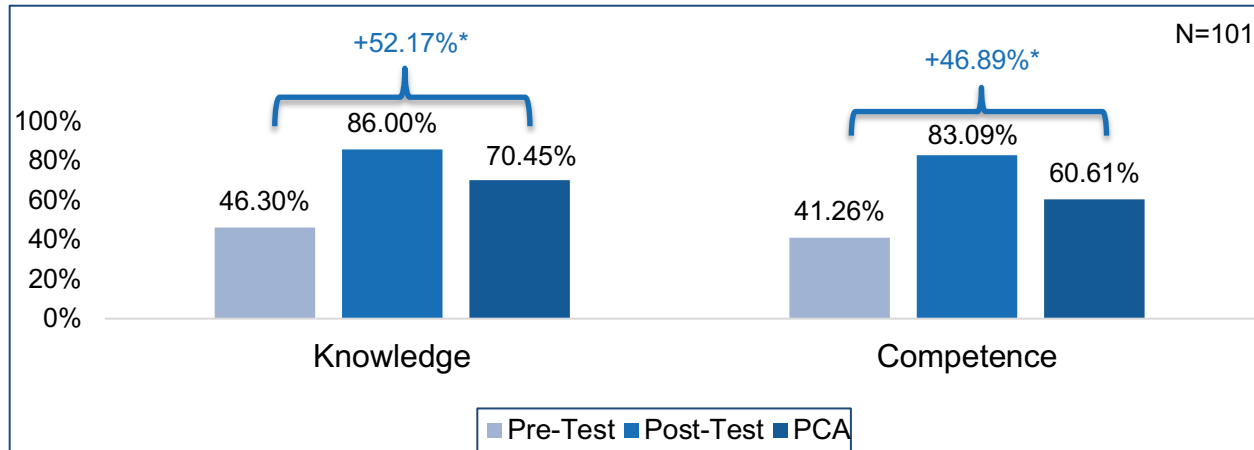
Learning Domains by Professional Cohort

	Nurse Practitioner				Physician Assistant				Physician			
	N	Pre Test	Post Test	% Change	N	Pre Test	Post Test	% Change	N	Pre Test	Post Test	% Change
Knowledge	382	44.37%	85.34%	+92.34%*	68	46.79%	80.88%	+72.86%*	63	52.38%	90.48%	+72.74%*
Competence	415	41.03%	86.62%	+111.11%*	78	40.74%	91.46%	*124.50%*	76	48.03%	85.12%	+77.22%*
Confidence	345	2.09	3.24	+55.02%*	60	1.85	2.95	+59.46%*	51	2.27	3.41	+50.22%*
Practice	328	3.66	4.58	+25.14%*	58	3.36	4.57	+36.01%*	49	3.76	4.39	+16.76%*

- This curriculum was targeted towards NPs and PAs, who together made up 80% of the total learner population. This report compares these target cohorts, along with physicians who made up 15% of the learner population.
- Significant gains were achieved by all cohorts in all learning domains.
- In all learning domains, physicians had the highest Pre-Test averages; NPs and PAs, however, demonstrated greater gains. In Competence and practice strategy, the substantially greater gains of NPs and PAs resulted in Post-Test averages that were higher than that of physicians. In Knowledge and Confidence, the Post-Test averages of physicians remained moderately higher than that of the other cohorts.

Quantitative Analyses - Retention

Note. * indicates significance $p \leq .05$, unmatched data



- At follow-up (the PCA) which learners were prompted to take 6+ weeks after their participation, net gains were measured in all learning domains. The unmatched t-tests showed that the net gains in Knowledge, Competence, and Confidence were significant.
- An item-level analysis of all PCA items revealed that score slippage occurred on all items at comparable levels.

New Specific Behaviors Reported at 4 weeks



I am following Heart Failure guidelines more closely

I am using the newest medications sacubitril/valsartan and ivabridine in appropriate patients

I am now reviewing patient medications and labs more closely in deciding treatments

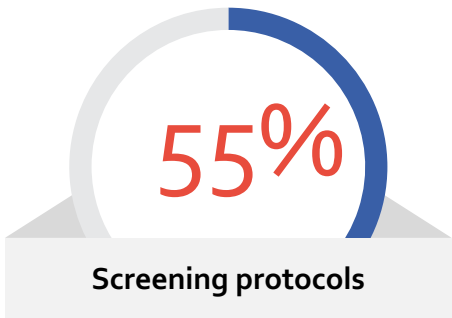
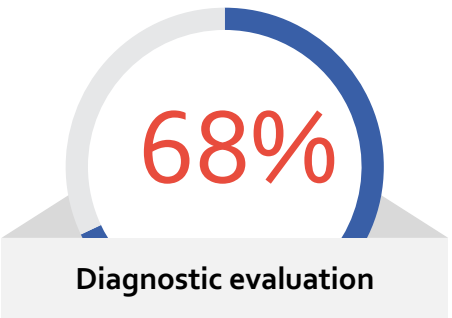
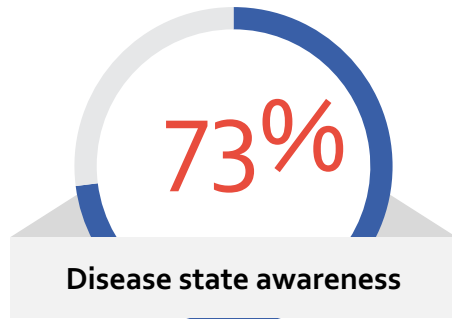
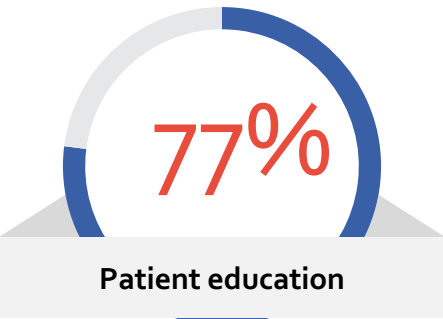
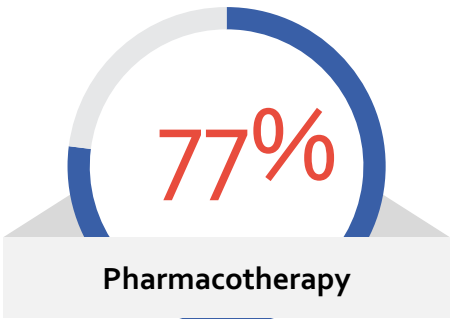
I am controlling blood pressure more aggressively

I recognize the importance of addressing sleep apnea in patients with heart failure



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

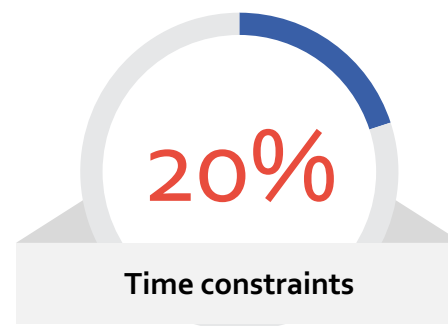
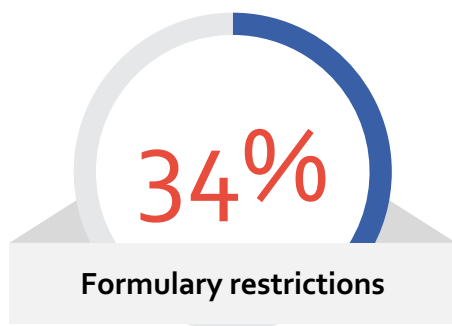
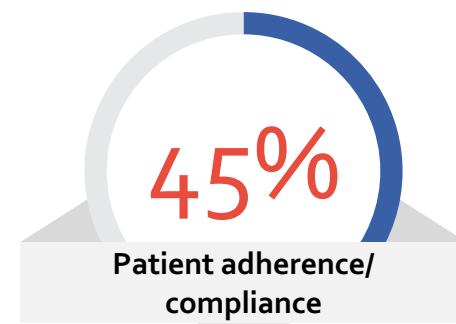
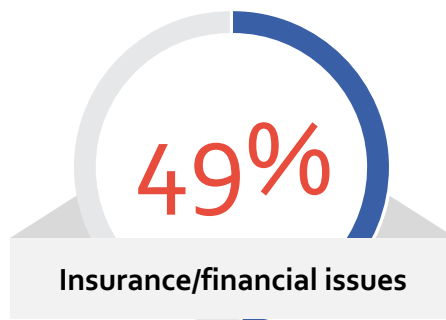
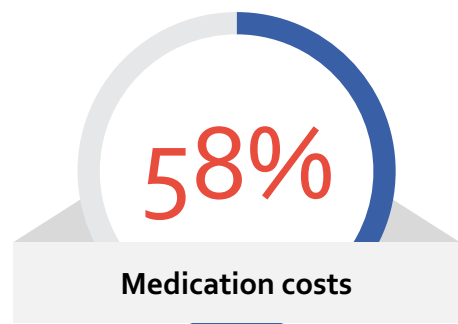
(4-week Post Assessment)



Sample Size: N = 101

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

(4-week Post Assessment)



Sample Size: N = 101

Appendix:

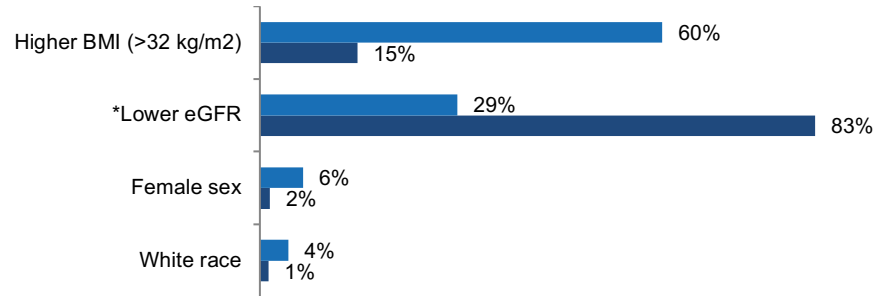
Question and Response Distributions for Assessment Items

Assessment Items

Pre-Test
Post-Test

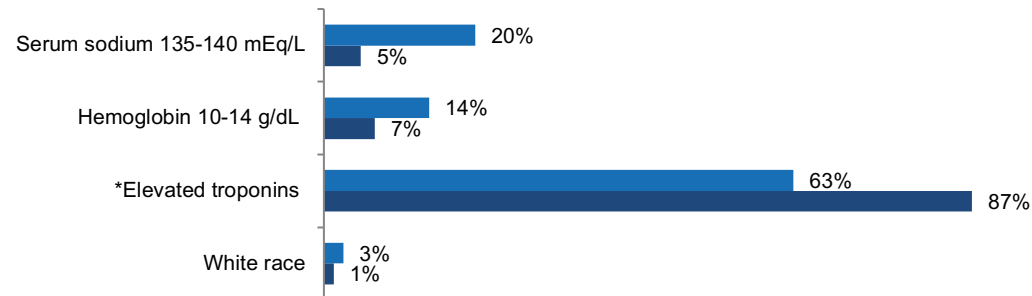
N=731-924

In a large clinical trial, which of the following were found to be significant independent predictors of mortality in heart failure?



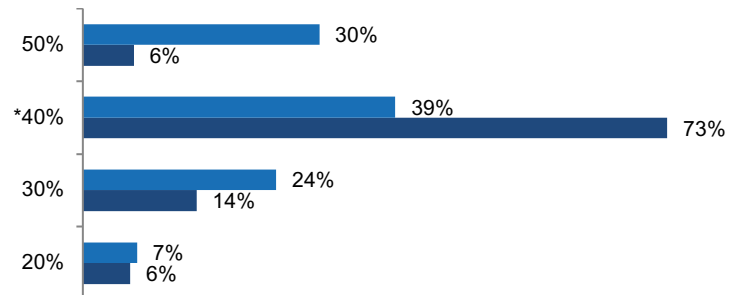
+181.00%

Which of the following has been shown to predict 30-day readmissions for heart failure?



+38.02%

Which level of ejection fraction on echocardiogram identifies HFrEF? :



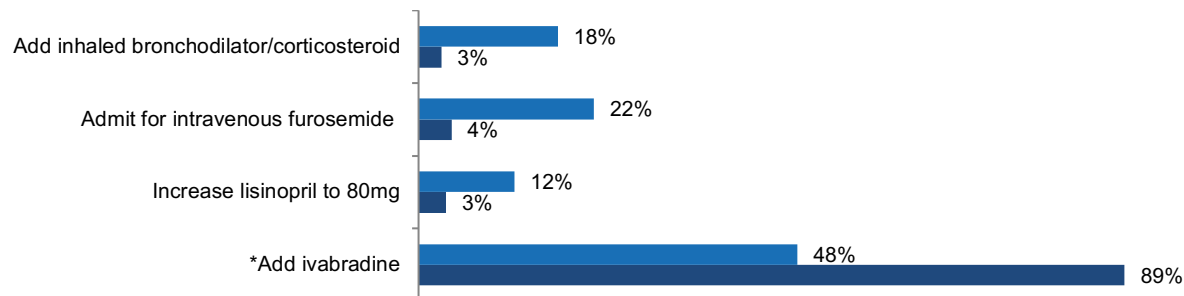
+86.97%

Assessment Items

Pre-Test
Post-Test

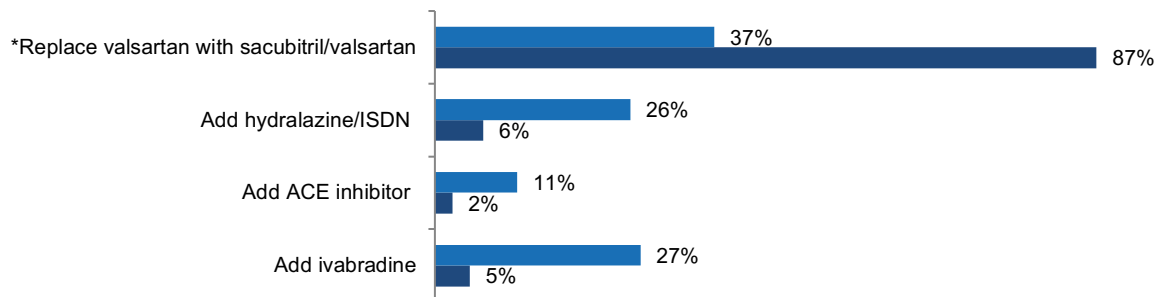
A 66 y/o black man presents with progressive DOE. Hx of NSTEMI, COPD, HTN, and dyslipidemia. Exam: BP 95/70, PR 88 bpm, NSR, occasional wheezing, and trace pedal edema. Echo: EF 30%. Meds: lisinopril 40 mg qd, aspirin 81 mg qd, atorvastatin 40 mg qd, metoprolol succinate 50 mg qd, furosemide 40mg BID, hydralazine/ISDN 37.5/20 mg tid, and albuterol/ipratropium 2 puffs qid. Previous attempts to increase dose of metoprolol led to fatigue and dyspnea.

N=765-915



+86.39%

A 72 y/o white woman presents with peripheral edema and dyspnea on exertion. NYHA class III HF - ejection fraction 35%. Recently hospitalized for heart failure exacerbation. Exam: BP 132/78, PR 68 bpm, NSR, and peripheral edema. Meds: valsartan 80 mg bid, aspirin 81 mg qd, rosuvastatin 40 mg qd, metoprolol succinate 100 mg qd, furosemide 40 mg bid, and eplerenone 50 mg qd.

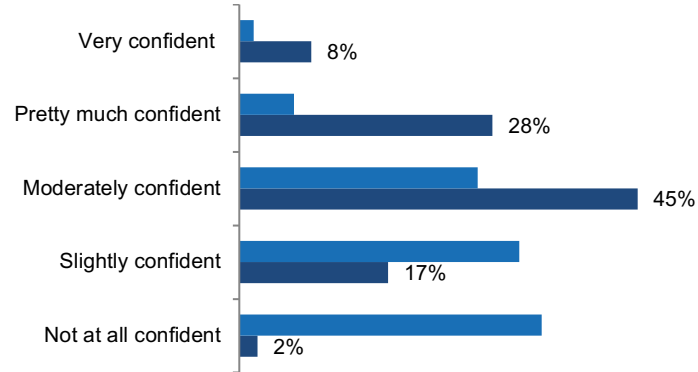


+136.82%

Assessment Items

Pre-Test
Post-Test

Please rate your confidence in you ability to incorporate new therapies for heart failure into your clinical practice: **N=393-928**



How often do you ensure that your heart failure patients are taking all appropriate guideline-directed medical therapies?

