Evolving Strategies for Cardiovascular Risk Reduction: Beyond Statin Therapy

Association of Black Cardiologists, Inc. (ABC)

A NACE Program

Final Live Program Outcomes Report

February 3, 2017

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Faculty

Jan Basile, MD
Professor of Medicine
Seinsheimer Cardiovascular Health Program
Medical University of South Carolina
Ralph H. Johnson VA Medical Center
Charleston, SC

Laurence O. Watkins, MD, MPH, FACC
Director, Healthy Heart Center
Port St. Lucie, FL

Icilma V. Fergus, MD, FACC
President, Association of Black Cardiologists
Director, Cardiovascular Disparities and
Associate Professor of Medicine
Mount Sinai School of Medicine
New York, NY

Priscilla Pemu, MD, MSCR, FACP
Professor of Medicine
Morehouse School of Medicine
Atlanta, GA

Phillip B. Duncan, MD
Heart Care for You, PC
Chester, VA

Mark A. Thompson, MD
Invasive Non-Interventional Cardiologist
Cardiac & Vascular Interventional Group
Dallas, TX

Robert L. Gillespie, MD, FACC, FASE, FASNC
Immediate Past Chairman of the Board
Association of Black Cardiologists
Director of Nuclear Imaging
Sharp Rees-Stealy Medical Group
San Diego, CA

David N. Smith, MD
Clinical Assistant Prof. of Medicine, Yale University
Associate Professor of Medicine, Wingate University
Adjunct Professor at UNC Chapel Hill
Externship Preceptor, Advisory Board Member, ECPI
Charlotte, NC

Karol E. Watson, MD, PhD
Professor of Medicine/Cardiology
Co-director, UCLA Program in
Preventive Cardiology
Director, UCLA Barbra Streisand Women's
Heart Health Program
Los Angeles, CA

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Saving the Hearts of a Diverse America

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Course Accreditation

The Association of Black Cardiologists, Inc. is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The Association of Black Cardiologists, Inc. designates this live activity for a maximum of 1.0 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Commercial Support

Emerging Challenges in Primary Care: 2016, was supported by educational funding provided by: Actelion; Amgen; Astellas; BioReference, An OPKO Company; Boehringer Ingelheim Pharmaceuticals, Inc. and Lilly USA, LLC; Lilly USA, LLC; Medtronic, Novartis Pharmaceuticals, Sanofi US and Regeneron Pharmaceuticals, and Shire.

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Cities and Dates

Emerging Challenges in Primary Care: Update 2016
Conference Schedule

June 4, 2016
Birmingham, AL

June 11, 2016
Columbus, OH

June 25, 2016*
Raleigh, NC

June 25, 2016
Tampa, FL

August 13, 2016*
Denver, CO

August 20, 2016
Sacramento, CA

August 27, 2016*
Troy, MI

September 10, 2016
Anaheim, CA

September 17, 2016
Ft. Lauderdale, FL

September 24, 2016
San Antonio, TX

October 10, 2016*
Uniondale, NY

October 15, 2016
Nashville, TN

October 22, 2016*
San Diego, CA

October 29, 2016
Houston, TX

***Simulcast and Live Conference**
** **Bolded** cities are where the lecture was given
Enduring Webcast launch date – October 1, 2016 – September 30, 2017

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Evolving Strategies for Cardiovascular Risk Reduction: Beyond Statin Therapy

Learning Objectives:

1. Discuss the benefits of LDL-C lowering with pharmacologic therapies that improve cardiovascular outcomes.

2. Define the appropriate use of non-statin medications in addition to statin therapy.

3. Discuss the role of anti-PCSK9 monoclonal antibody therapy in LDL-C reduction to achieve cardiovascular risk reduction.

4. Recognize and develop appropriate treatment strategies for special populations (women, elderly, ethnic minorities) that would benefit from lipid lowering therapy

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		  • Content Completions
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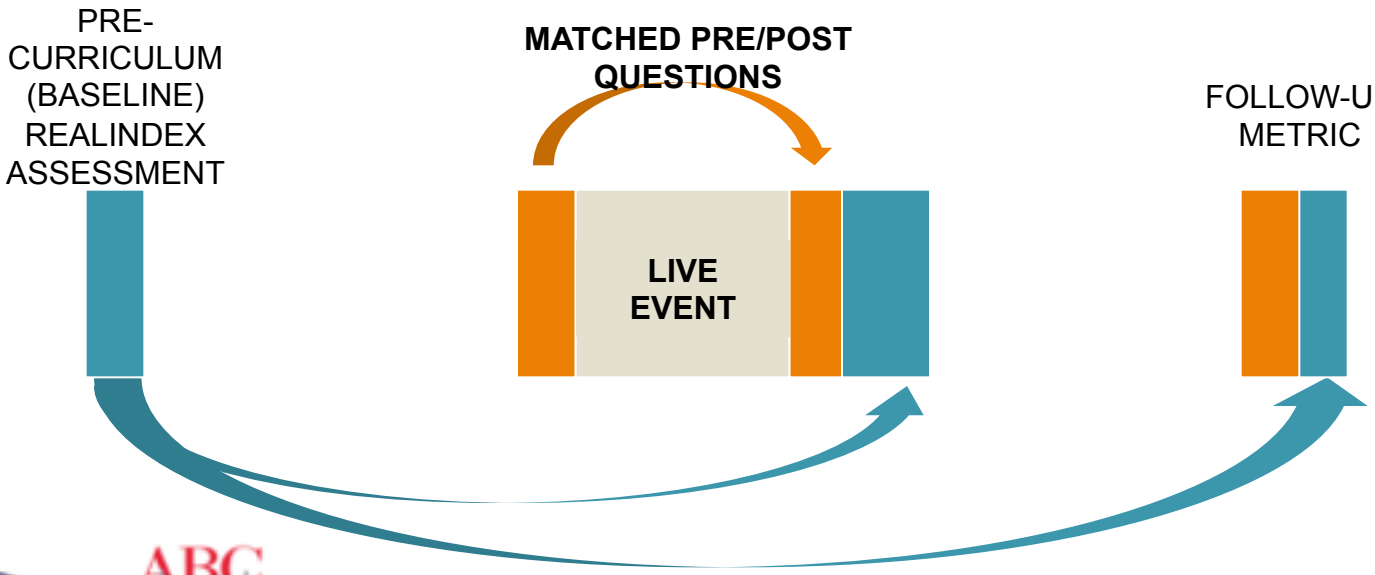
Curriculum Data Collection via RealMeasure® Outcomes Assessment Methodology*

ACTIVITY OUTCOMES PROTOCOL

- Measure Moore's Levels 1–4
- Paired Pre- and Post-Test questions
- Employs Knowledge, Competence, Confidence, and practice strategy questions

CURRICULUM OUTCOMES PROTOCOL

- Measure Moore's Levels 1–5
- Learning Objectives
- RealIndex™ question:
  - Prior to the activity
  - After completion of the activity



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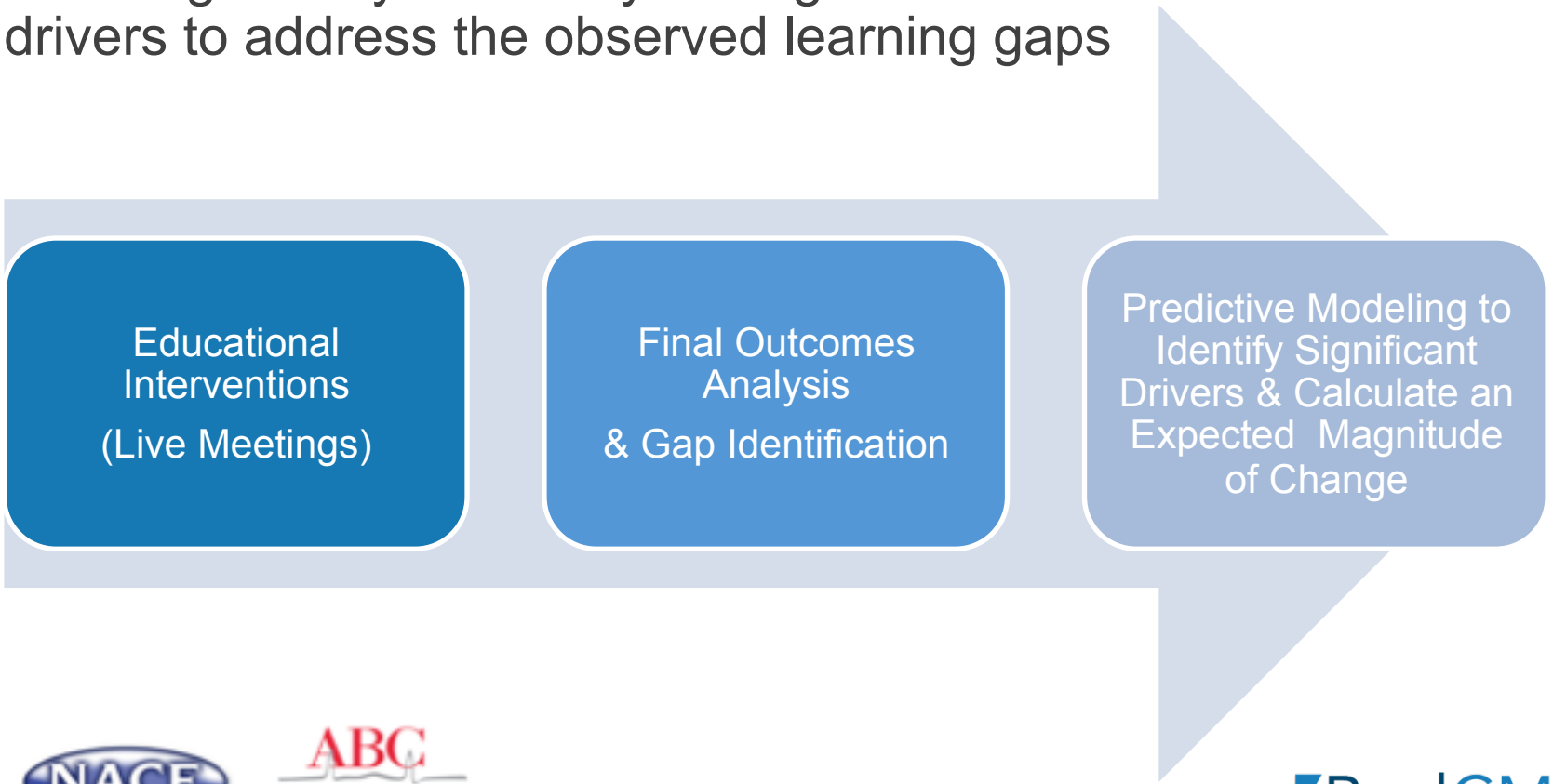
PredictiveModeling

Predictive modeling will be employed following the completion of the meeting series and enduring activity to identify the significant drivers to address the observed learning gaps



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Executive Summary

Outcomes at Moore's Levels 1-5

Level 1 (Participation):

Live Meeting Location (Date)	Attendees	Started Pre-Test	Started Post-Test	
Birmingham, AL (June 4, 2016)	200	200	155	77.10%
Columbus, OH (June 11, 2016)	85	77	62	80.50%
Raleigh, NC (June 25, 2016)*	169/307	155	95	61.30%
Tampa, FL (June 25, 2016)	303	273	144	52.70%
Denver, CO (August 13, 2016)*	153/265	109	103	67.32%
Sacramento, CA (August 20, 2016)	111	72	80	64.84%
Troy, MI (August 27, 2016)*	223/227	146	137	61.43%
Anaheim, CA (Sept. 10, 2016)	172	95	115	66.86%
Ft. Lauderdale, FL (Sept 17, 2016)	300	174	157	52.33%
San Antonio, TX (Sept. 24, 2016)	126	96	95	75.40%
Uniondale, NY (Oct. 8, 2016)*	291/120	180	202	69.41%
Nashville, TN (Oct. 15, 2016)	166	125	120	72.30%
San Diego, CA (Oct. 22, 2016)*	122/91	91	89	73.00%
Houston, TX (Oct 29, 2016)	207	127	127	61.35%
All Meetings (Including simulcast)	**3638**	**1920**	**1681**	**87.55%**

*Cities with simulcast

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Executive Summary

Level 2 (Satisfaction): Participants' comments and self-reports reflect a high level of satisfaction with the curriculum and indicate that the activities were relevant to their practice. If information is available from NACE

Levels 3-4 (Knowledge, Competence, Confidence, and Performance): Statistically significant gains were measured across the curriculum in all learning domains across the curriculum.

Outcome Indicator (matched learners only)	**Pre-Test Avg. Score (SDS)**	**Post-Test Avg. Score (SDS)**	**% Change**	**(Sig.)**
Knowledge	52.39% (42.47)	78.87% (34.68)	**50.54**	< .0005
Competence	72.89% (44.59)	87.95% (32.65)	**20.66**	< .0005
Confidence	2.48 (1.05)	3.61 (0.96)	**45.56**	< .0005
RealIndex	59.73% (23.44)	76.76% (20.38)	**28.51**	< .0005

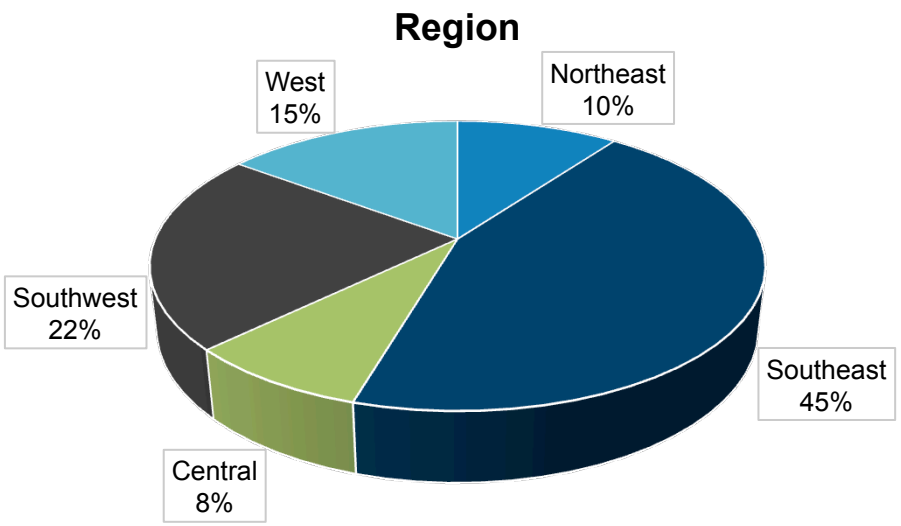
Level 2: Satisfaction (*N* = 3638)

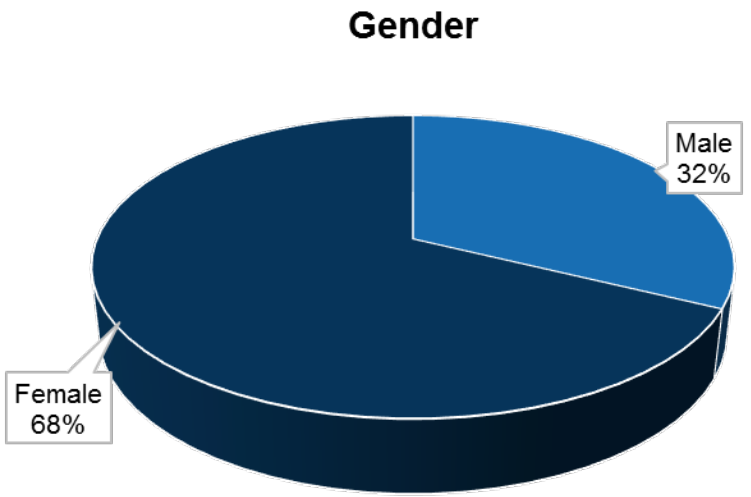
- 98% rated the activity as excellent
- 99% indicated the activity improved their knowledge
- 97% stated that they learned new and useful strategies for patient care
- 99% said they would implement new strategies that they learned in their practice
- 100% said the program was fair-balanced and unbiased

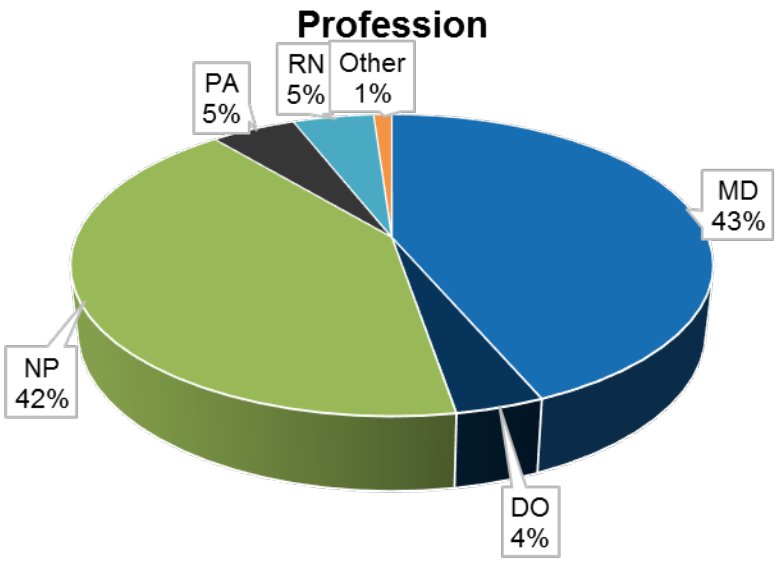
Were our learners satisfied? Yes! Data was collected in fourteen cities for the Emerging Challenges in Primary Care program.

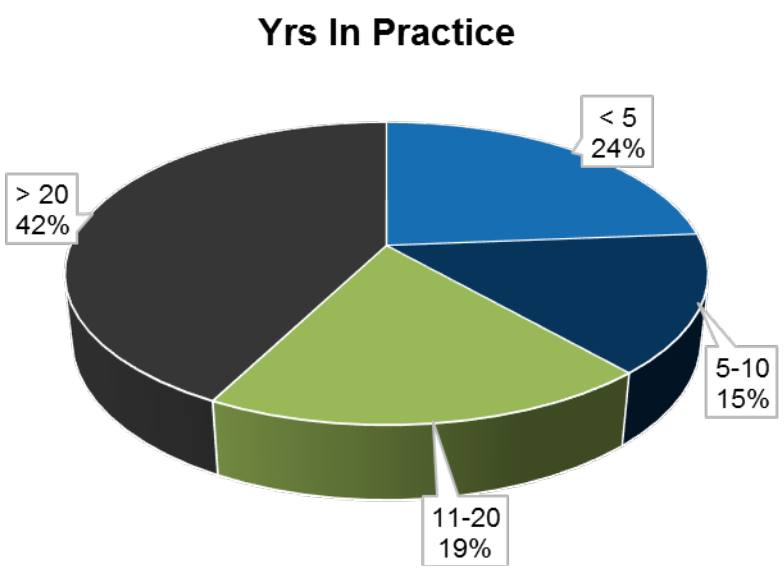
Level 1: Demographics

Level 1: Participation – Demographics









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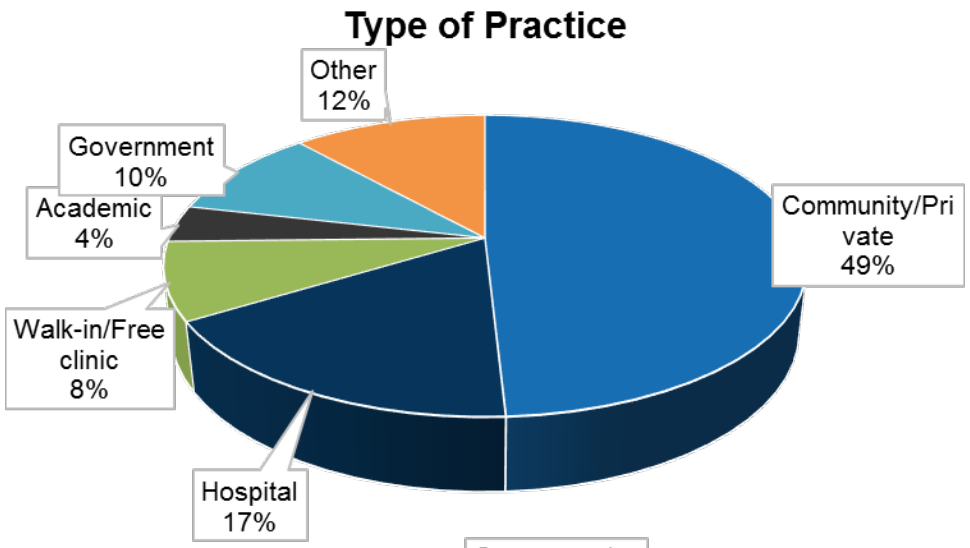
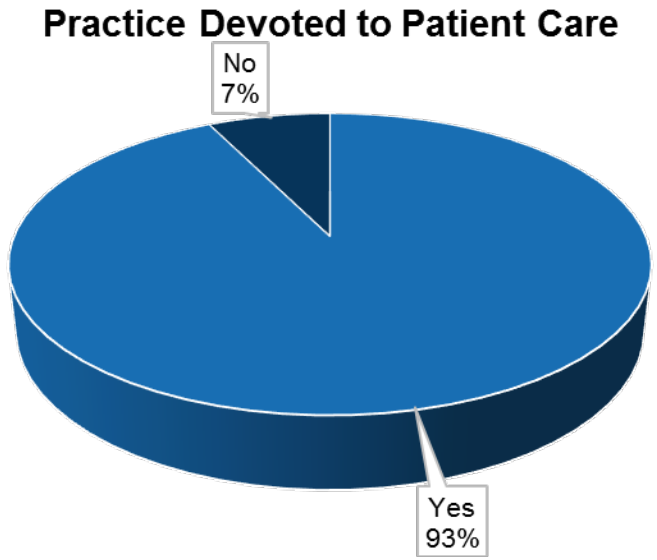
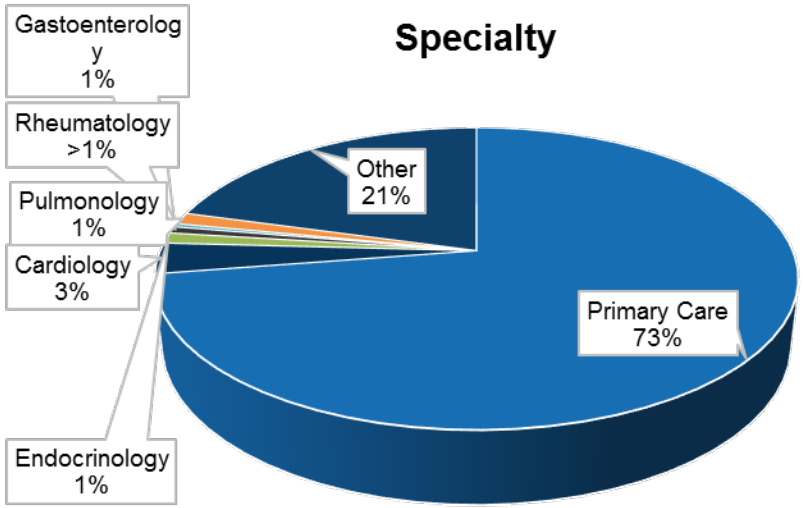
Level 1: Participation – Demographics







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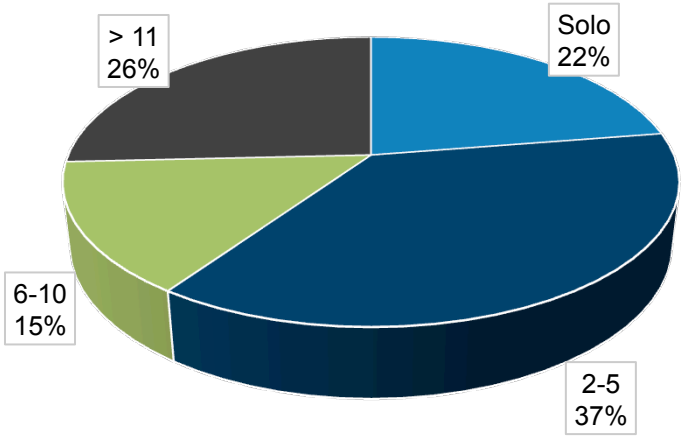
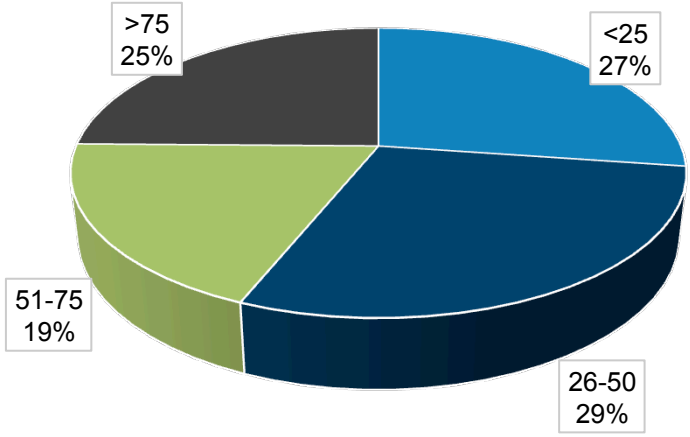
Level 1: Participation – Demographics

Number of Providers



Number of Patients



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Curriculum Patient Impact:

Participants (*N* = *3*,638)	
	Patient Reach Range
Weekly	23,720-70,832
Yearly	863,399-2,578,280

Learners (*N* = 3,638) were asked to complete an item approximating the number of patients that they personally see in their practice on a weekly basis by selecting a range. The estimated ranges were calculated and the results indicate that this curriculum has the potential to impact the care of:

- 23,720-70,832 patients on a weekly basis.
- 863,399-2,578,280 patients on an annual basis, based on the assumption that 30% of patients will be seen more than once per year by their clinician.
- Estimates included learners who indicated they do not currently see patients.
- Estimates for individual learner indicate they see approximately 6-19 patients per week.

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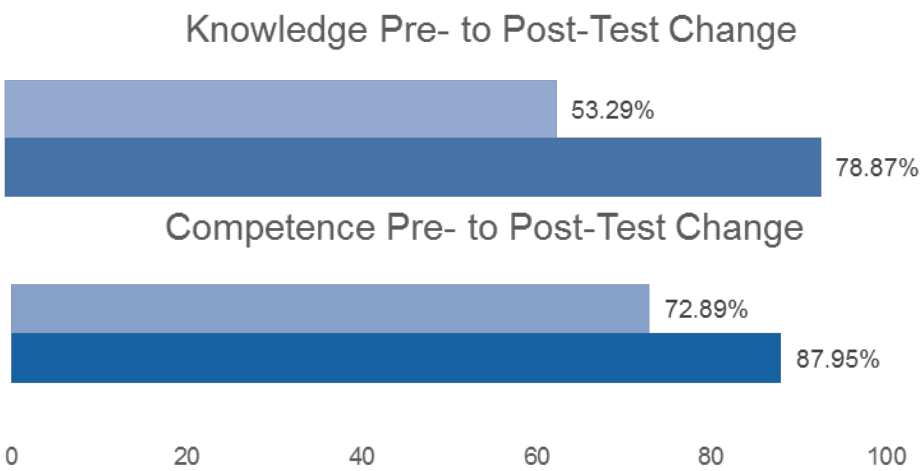
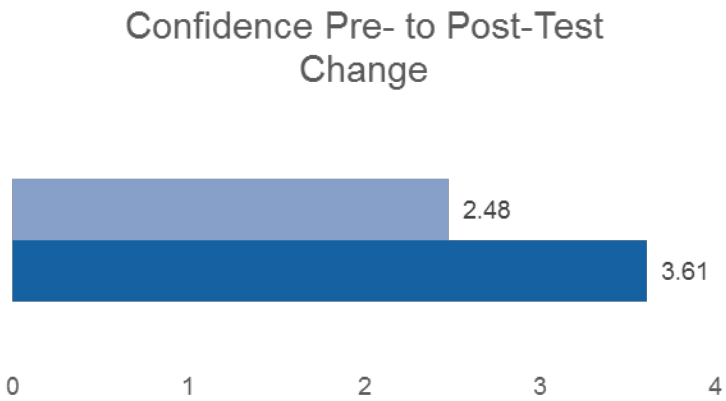
Levels 3-5: Outcomes Metrics

Levels 3-4 - Learning Domain Summary

Outcome Indicator	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Change	P - Value
Knowledge	52.39% (42.47)	78.87% (34.68)	**50.54**	< .0005
Competence	72.89% (44.59)	87.95% (32.65)	**20.66**	< .0005
Confidence	2.48 (1.05)	3.61 (0.96)	**45.56**	< .0005
Additional Questions	40.18% (30.17)	N/A	-	-





- Statistically significant and substantial gains ($p < .0005$) were achieved in all domains. Learner scores improved from Pre-Test to fairly high averages at Post-Test.
  - Learners demonstrated greater proficiency on Competence items at baseline, and further improvements at Post-Test.
- Learner score scatter, as measured by standard deviation scores, (SDS) reduced to moderate levels by Post-Test indicating that the majority of learners' responses were more consistent with the mean.
- These percentage changes were above established benchmarks, which estimate gains ranging from 15% to 20% by Post-Test.

Level 3 - Learning Objectives

Learning Objective	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
1. Discuss the benefits of LDL-C lowering with pharmacologic therapies that improve cardiovascular outcomes.	53.10% (48.17)	91.39% (27.11)	**72.11**	< .0005
2. Define the appropriate use of non-statin medications in addition to statin therapy.	59.73% (23.44)	76.76% (20.39)	**28.51**	< .0005
3. Discuss the role of anti-PCSK9 monoclonal antibody therapy in LDL-C reduction to achieve cardiovascular risk reduction.	48.54% (31.52)	66.25% (29.32)	**36.49**	< .0005
4. Recognize and develop appropriate treatment strategies for special populations (women, elderly, ethnic minorities) that would benefit from lipid lowering therapy	57.20% (30.26)	84.66% (28.74)	**48.00**	< .0005

- Statistically significant ($p < .0005$) and substantial gains were measured for all items mapped to the curriculum Learning Objectives. Observed gains by Post-Test ranged from 29 to 71%, from relatively moderate Pre-Test averages. LO 1 demonstrated the greatest gain by Post-Test (72%). LO4 showed the most modest gain (29%).
- Learners remained challenged by the role of PCSK9 inhibitors in reducing CVD risk, at Post-Test, evidenced by the relatively low averages (66%) achieved.
- The percentage change observed from Pre- to Post-Test were substantially above historical benchmarks approximately 20% by Post-Test.

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Level 5 – Performance: The RealIndex

A 70-year-old African American woman with a history of dyslipidemia, hypertension, and obesity presents 2 years post NSTEMI with no current symptoms or side effects of medical therapy.
BP 128/72 mmHg, eGFR 47 mL/min/1.73m2, LDL-C 88 mg/dL, HDL-C 38 mg/dL, triglycerides 148 mg/dL, and total-C 156 mg/dL.
Current medications include valsartan/hydrochlorothiazide 320/25 mg qd, atorvastatin 80 mg qd, metoprolol XL 50 mg qd, and aspirin 81 mg qd.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with best clinical practice for ASCVD risk management:

Consistent	**Not Consistent**
Consider adding ezetimibe 10 mg qd. (LO1,2)	Consider adding niacin. (LO2) (non-statins)
If ezetimibe 10 mg qd is started and LDL-C remains >70 mg/dL at follow up, consider PCSK-9 inhibitor. (LO2,3,4)	Consider adding fibrate. (LO2) (non-statins)
	Consider adding PCSK-9 inhibitor. (2,3,4)

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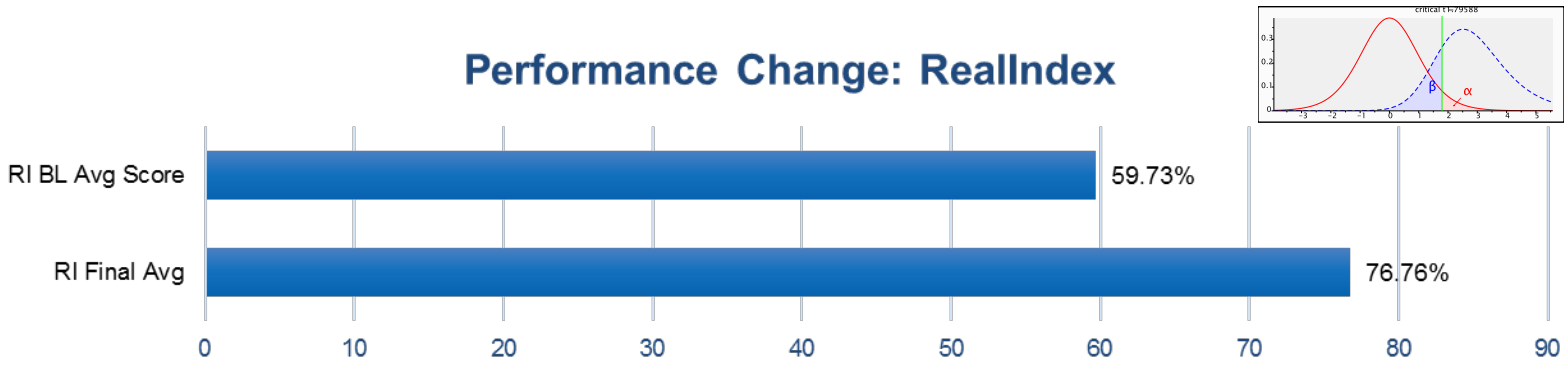
Level 5 – Performance Change: RealIndex

	Curriculum Intervention				Intervention Effect		
N	Baseline Avg. Score (SDS)	Final Avg. Score (SDS)	% Change	P - Value	Average Effect Size	% Non-Overlap Baseline - Final	Power
1671	59.73% (23.44)	76.76% (20.38)	**28.51**	< .0005	0.80	47.4%	0.800



A statistically significant and substantial gain (29%, p < .0005) was measured from baseline to the final RealIndex, which resulted in a *large* effect size (d = 0.80) representing (47.4% non-overlap), achieving moderate statistical power (0.800).

- This improvement is above historical benchmarks that show Performance gains ranging from 5%-10% from baseline.
- Standard deviation scores (SDSs) also improved across the curriculum, indicating that the majority of learners demonstrated greater consistency in their responses.

Levels 3-5 - Learning Domain Summary: By Location

*Competence & Performance metric

Birmingham (N = 144) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	73.96% (44.12)	88.00% (32.63)	**18.98**	.003
Competence	71.67% (45.25)	90.16% (29.90)	**25.58**	.001
Confidence	2.47 (1.07)	3.84 (0.94)	**55.47**	< .0005
RealIndex*	59.08% (29.04)	73.76% (18.43)	**24.85**	< .0005

Raleigh (N = 119) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	80.00% (40.18)	83.04% (37.01)	**3.80**	.849
Competence	67.14% (47.31)	85.39% (35.52)	**27.18**	.083
Confidence	2.58 (1.06)	3.64 (0.86)	**41.09**	< .0005
RealIndex*	59.09% (23.58)	79.24% (20.74)	**34.10**	< .0005

Columbus (N = 67) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	76.92% (42.46)	94.29% (23.38)	**22.58**	.001
Competence	73.47% (44.61)	75.51% (43.45)	**2.78**	.160
Confidence	2.78 (1.04)	3.48 (0.99)	**25.18**	< .0005
RealIndex*	61.99% (24.11)	74.40% (17.70)	**19.44**	< .0005

Tampa (N = 161) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	46.78% (39.30)	72.62% (39.76)	**55.24**	< .0005
Competence	-	-	**-**	-
Confidence	2.40 (1.13)	3.43 (0.95)	**42.92**	< .0005
RealIndex*	58.01% (26.02)	71.70% (26.03)	**23.60**	< .0005

Levels 3-5 - Learning Domain Summary: By Location

*Competence & Performance metric

Anaheim (N =120) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	55.45% (40.26)	79.55% (31.25)	**43.46**	<.0005
Competence	-	-	**-**	<.0005
Confidence	2.77 (0.97)	3.68 (0.86)	**32.85**	<.0005
RealIndex*	61.82% (20.71)	70.96% (18.48)	**14.78**	<.0005

Denver (N =130) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	52.44% (38.33)	84.96% (28.53)	**62.14**	<.0005
Competence	-	-	**-**	<.0005
Confidence	2.55 (1.08)	3.86 (0.91)	**51.37**	<.0005
RealIndex*	60.88% (20.88)	73.65% (16.20)	**20.98**	<.0005

Ft. Lauderdale (N =188) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	39.24% (41.36)	66.00% (40.40)	**68.20**	<.0005
Competence	-	-	**-**	<.0005
Confidence	2.45 (1.08)	3.41 (1.04)	**39.18**	<.0005
RealIndex*	59.77% (25.17)	72.89% (20.26)	**21.95**	<.0005

Houston (N =119) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	44.34% (44.39)	81.60% (28.72)	**84.32**	<.0005
Competence	-	-	**-**	<.0005
Confidence	2.47 (1.00)	3.94 (0.77)	**61.48**	<.0005
RealIndex*	54.41% (25.12)	89.06% (17.64)	**63.68**	<.0005

Levels 3-5 - Learning Domain Summary: By Location

*Competence & Performance metric

Nashville (N = 120) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	44.23% (40.20)	75.50% (34.13)	**70.70**	<.0005
Competence	-	-		<.0005
Confidence	2.23 (0.98)	3.20 (0.87)	**43.50**	<.0005
RealIndex*	56.10% (24.50)	76.00% (18.80)	**35.47**	<.0005

Sacramento (N = 96) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P – Value
Knowledge	57.22% (39.35)	83.89% (29.82)	**46.61**	<.0005
Competence	-	-		<.0005
Confidence	2.77 (1.07)	3.88 (0.93)	**40.10**	<.0005
RealIndex*	61.20% (25.32)	80.71% (18.58)	**31.90**	<.0005

San Antonio (N =103) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	46.57% (35.36)	78.43% (30.27)	**68.41**	<.0005
Competence	-	-		<.0005
Confidence	2.31 (1.00)	3.71 (0.94)	**60.60**	<.0005
RealIndex*	60.02% (19.61)	85.80% (16.60)	**42.95**	<.0005

San Diego (N =62) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	58.33% (38.14)	90.83% (23.45)	**55.72**	<.0005
Competence	-	-		<.0005
Confidence	2.49 (0.88)	3.66 (0.92)	**47.00**	<.0005
RealIndex*	61.60% (22.42)	83.15% (20.15)	**34.98**	<.0005

Levels 3-5 - Learning Domain Summary: By Location

*Competence & Performance metric

Troy (N =171) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P – Value
Knowledge	42.19% (42.17)	71.81% (39.19)	**70.21**	<.0005
Competence	-	-		<.0005
Confidence	2.48(1.04)	3.39(0.99)	**36.69**	<.0005
RealIndex*	59.18% (24.40)	78.03% (21.54)	**31.85**	<.0005

Uniondale (N =100) Outcome Indicator	Pre-Test Avg. Score (SD)	Post-Test Avg. Score (SD)	% Change	P - Value
Knowledge	48.05% (45.48)	77.27% (35.90)	**60.81**	<.0005
Competence	-	-		<.0005
Confidence	2.16(1.20)	3.62(1.03)	**67.59**	<.0005
RealIndex*	63.92% (22.67)	69.87% (21.73)	**9.31**	-

- While all cities achieved statistically significant improvements in all domains, many continue to struggle with aspects of the curriculum. Cities including Uniondale, Birmingham, Tampa and Anaheim demonstrated limited improvement (<73%) in performance measures (RealIndex) at Post-Test, while Houston, Sacramento, San Diego, and San Antonio achieved high Post-Test averages (> 80%).
  - This variability may translate to regional differences in performance that impact drivers in the predictive model.

Item-Level/Gap Analysis
(Including Analysis of Demographic Correlations)

Knowledge

Question	LO4 – Treatment strategies for special populations		
African American patients are more likely to be prescribed lipid-lowering therapies than white patients?			
Correct Answer	**Choice**	**Pre-Test (*N* = 1516)**	**Post-Test (*N* = 1639)**
	TRUE	36.5%	20.4%
X	**FALSE**	**63.5%**	**79.6%**

Question	LO 3 – PCSK9 inhibitors MOA		
FDA-approved PCSK-9 inhibitors lower LDL-C levels through which of the following actions?			
Correct Answer	**Choice**	**Pre-Test (*N* =1090)**	**Post-Test (*N*= 1268)**
X	**Preserving LDL receptors on hepatocyte cell surfaces**	**32.00%**	**77.1%**
	Inhibiting HMG CoA reductase	28.30%	4.7%
	Preserving internalization of LDL cholesterol	22.30%	14.4%
	Blocking cholesterol production	17.30%	3.90%

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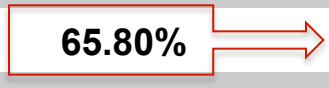
Competence

Question

A 63 year old African American woman presents for a checkup. She has a history of hypertension, obesity, and dyslipidemia. She does not have a history of heart disease, but her 10 year ASCVD risk is 9.1%. She is treated with atorvastatin 10 mg qd for dyslipidemia. Today her LDL-C is 40mg/dL…

Choice	Pre-Test (*N* = 257)	Post-Test (*N* = 269)
Reduce dose of atorvastatin	13.60%	5.20%
Maintain current dose	**65.80%**	**82.90%**
Switch to ezetimibe	8.60%	7.40%
Discontinue statin until LDL-c >70 mg/dL	5.10%	1.10%
Switch to a less potent statin	7.00%	3.30%



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Confidence

Question

Please rate your confidence (on an ascending scale from 1-5) in your ability to manage patients with hypercholesterolemia who do not achieve desired lipid results despite maximally tolerated statin therapy:

Choice	Pre-Test (*N* = 1690)	Post-Test (*N* = 1564)
Not at all confident	19.3%	1.5%
Slightly confident	31.5%	10.6%
Moderately confident	32.0%	32.7%
Pretty much confident	13.5%	36.4%
Very confident	3.7%	18.7%

- At Pre-Test learners' self-reported Confidence levels, on average, were fairly low (2.48). At Post-Test, their self-reported Confidence increased to an average of (3.61), representing a substantial, statistically significant increase of (46%).

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Additional Questions (non-matched ARS items presented during meeting)

Question Medication Adherence

Which of the following strategies significantly improved adherence to lipid-lowering therapy in clinical studies?

Correct Answer	Choice	Internal Item (*N* = 1469)
	Multiple daily dosing	2.20%
	Brightly colored bottles	11.00%
	Utilizing older medications	6.70%
X	**In-hospital medication initiation**	**33.60%**
	Easy to remember medication name	46.50%

Question Practice Strategy

All of the following strategies are recommended for patients with statin intolerance EXCEPT:

Correct Answer	Choice	Internal Item (*N* = 1367)
X	**Add coenzyme Q10**	**34.80%**
	Decrease statin dose	10.30%
	Switch to different statin	13.80%
	Decrease statin frequency	21.40%
	Modify therapy to avoid potential drug-drug interactions	19.70%

Additional Questions (non-matched ARS items presented during meeting)

Question Medication Management

Which of the following statements about the patient in this case is supported by evidence and guidelines?

Correct Answer	Choice	Internal Item (*N* = 1412)
	She is at LDL-C target	7.90%
	The dose of ezetimibe should be increased	4.20%
	The dose of atorvastatin should be increased	4.60%
	Further LDL-C reduction may be associated with adverse events	6.70%
X	**Further LDL-C reduction is associated with reduced risk for CV events**	**76.60%**

Question Medication Selection

Which of the following medication has been shown to improve cardiovascular outcomes when added to statin therapy?

Correct Answer	Choice	Internal Item (*N* = 1567)
	Niacin	3.30%
X	**Ezetimibe**	**13.5%**
	PCSK9 inhibitors	39.40%
	Bile acid sequestrants	1.50%
	All of the above	42.40%

Additional Questions (non-matched ARS items presented during meeting)

Question		
Which of the following statement is true?		
Correct Answer	**Choice**	**Internal Item (*N* = 1214)**
	Statin therapy does not benefit patients with low HDL-C	14.3%
	CHD is very rare in Asian patients	1.40%
	A fibrate is recommended in this patient per 2013 ACC-AHA cholesterol guidelines	12.80%
X	**HDL-C function may be as important as HDL-C level**	**55.90%**
	Niacin further reduces risk for CV events when added to statin therapy	15.60%

Performance: The RealIndex

A 70-year-old African American woman with a history of dyslipidemia, hypertension, and obesity presents 2 years post NSTEMI with no current symptoms or side effects of medical therapy.
BP 128/72 mmHg, eGFR 47 mL/min/1.73m2, LDL-C 88 mg/dL, HDL-C 38 mg/dL, triglycerides 148 mg/dL, and total-C 156 mg/dL.
Current medications include valsartan/hydrochlorothiazide 320/25 mg qd, atorvastatin 80 mg qd, metoprolol XL 50 mg qd, and aspirin 81 mg qd.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with best clinical practice for ASCVD risk management:

Consistent	**Not Consistent**
Consider adding ezetimibe 10 mg qd. **(50.97% BL → 92.44% FINAL)**	Consider adding niacin. (non-statins) **(69.01% BL → 88.40% FINAL)**
If ezetimibe 10 mg qd is started and LDL-C remains >70 mg/dL at follow up, consider PCSK-9 inhibitor. **(72.35% BL → 90.92% FINAL)**	Consider adding fibrate. (non-statins) **(71.03% BL → 79.55% FINAL)**
	Consider adding PCSK-9 inhibitor. **(34.55% BL → 32.81% FINAL)**

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Correlational Analysis with Demographic Data (Levels 1-5)

- **Years in practice was found to be positively related** ($p \leq .0005$) to learner performance at Pre- and Post-Test for Knowledge and Competence items, with more experienced clinicians (>10 years in practice) demonstrating higher averages across these domains.
- **When number of patients per week was analyzed,** a positive relationship between overall results, including self-reported Confidence, with those who see more than >75 patients per week outperforming all other groups ($p \leq .0005$).
- **When gender was correlated with learner performance,** females' Knowledge, and Confidence scores were lower than male learners at both Pre and Post-Test ($p \leq$ 0005) demonstrating awareness of their Knowledge deficits.
- **When specialty was correlated with learning performance,** endocrinology achieved higher averages for Knowledge items at Pre-Test (>60%) than the other specialist groups; Confidence was negatively correlated with specialty ($p \leq 0005$) indicating a lack of self-reported Confidence, regardless of specialist training and/or experience.
- **Profession was positively related** ($p \leq .001$) **to both Knowledge and Confidence**; PAs demonstrated greatest overall proficiency, followed by MDs and NPs. Self-reported Confidence was positively related to profession with MDs reporting slightly higher Confidence scores than other groups.

Summary of Outcomes Analyses (Levels 1-5)

- **Statistically significant gains** were measured across the curriculum from Pre-Test (and baseline) to Post-Test (and final) in all learning domains across the intervention.
  1. **Statistically significant gains** were observed from Pre-Test to Post-Test **for all Learning Objectives** identified by the curriculum.
  2. While gains were robust, **learners remained challenged by LO3 at Post-Test,** regarding the role of PCSK9 inhibitors to reduce risk of CVD.
- Persistent (present at Post-Test) **learning gaps were identified**, with variations for specific cohort groups:
  1. Knowledge regarding the **mechanism of action for PCSK9 inhibitors**
  2. Competency concerning when it is (and is not) appropriate to add **a PCSK9 inhibitor to a current therapy regimen** to reduce CVD risk.

4 Week Follow-Up Survey Information

RETENTION: 4 week follow-up survey

- Data obtained from participants 4 weeks after the program demonstrated some decline in learning from the Post-Test scores in 6 areas, but slight improvement from Pre-Test scores in the 1 area focused on the timing of PCSK-9 therapy as recommended by the 2016 ACC Expert Consensus Decision Pathway.
  - These results suggest that nearly all of the learning objectives for this activity were effectively addressed with attendees.

What specific ***skills or practice behaviors*** have you implemented for patients with hypercholesterolemia since this CME activity?

Open-ended responses:

- *Prescribed a PCSK-9 inhibitor*
- *More aware of new cholesterol lowering meds*
- *Reviewed new guidelines*
- *Know how to treat hypercholesterolemia better and more aggressively*
- *Increased vigilance over looking at hyperlipidemia*
- *Adding PCSK-9 for refractory hyperlipidemia*
- *I am more aggressive in reaching the LDL goals*
- *Better knowledge of lipid management meds*
- *Spending more time on patient education*
- *Consider risk factors when selecting treatment regimens*

What specific ***barriers*** have you encountered that may have prevented you from successfully implementing strategies for patients with hypercholesterolemia since this CME activity?

Open-ended responses:

- *Medication cost*
- *Patient compliance*
- *Side effects from medications*
- *Insurances*
- *Patients resistant to taking more meds*
- *Expectations of patient and side effect concerns*
- *Formulary restrictions*
- *Insurance reimbursements for the PCSK-9*
- *Guideline awareness*

Predictive Modeling

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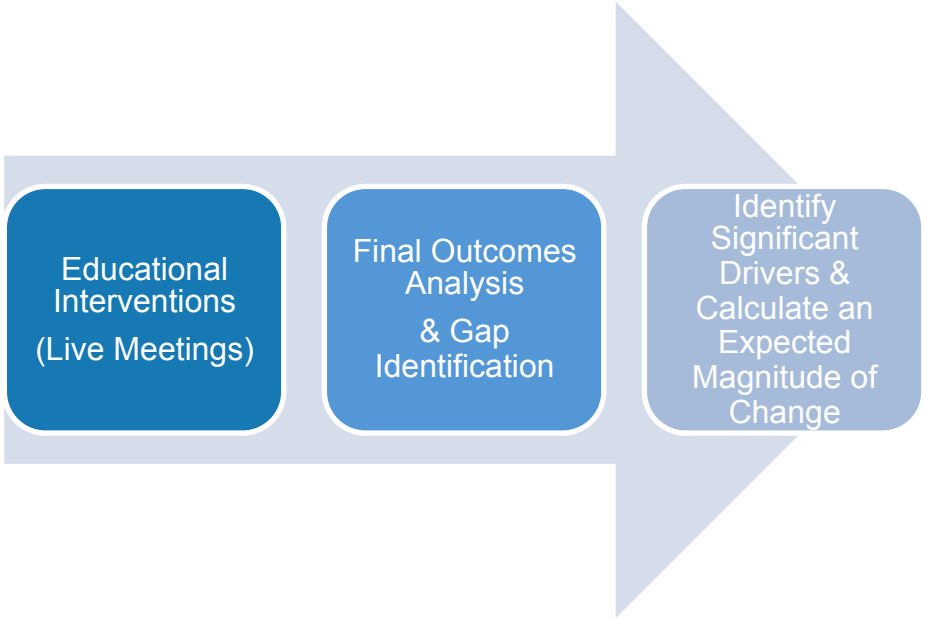
PredictiveModeling

After an educational intervention takes place, a gap analysis is completed. The **gap analysis identifies areas where learners continued to struggle at Post-Test.**

The identified gaps are then compiled into a **'target gap score'**. This score enables us to **target gaps** in **knowledge, competence, practice strategy,** and/or **clinical performance,** statistically.

Learner **demographics, as well as the remaining knowledge, competence, confidence, practice strategy and clinical performance** items are **modeled against the target gap score (Post-Test)** to identify areas that can potential reduce these gaps. These areas of are identified as **drivers.**

The model can **predict future scores**, if the **drivers are addressed**. This includes the **magnitude of change** that can be expected enabling educators to better target their curricula to the needs of their learners.



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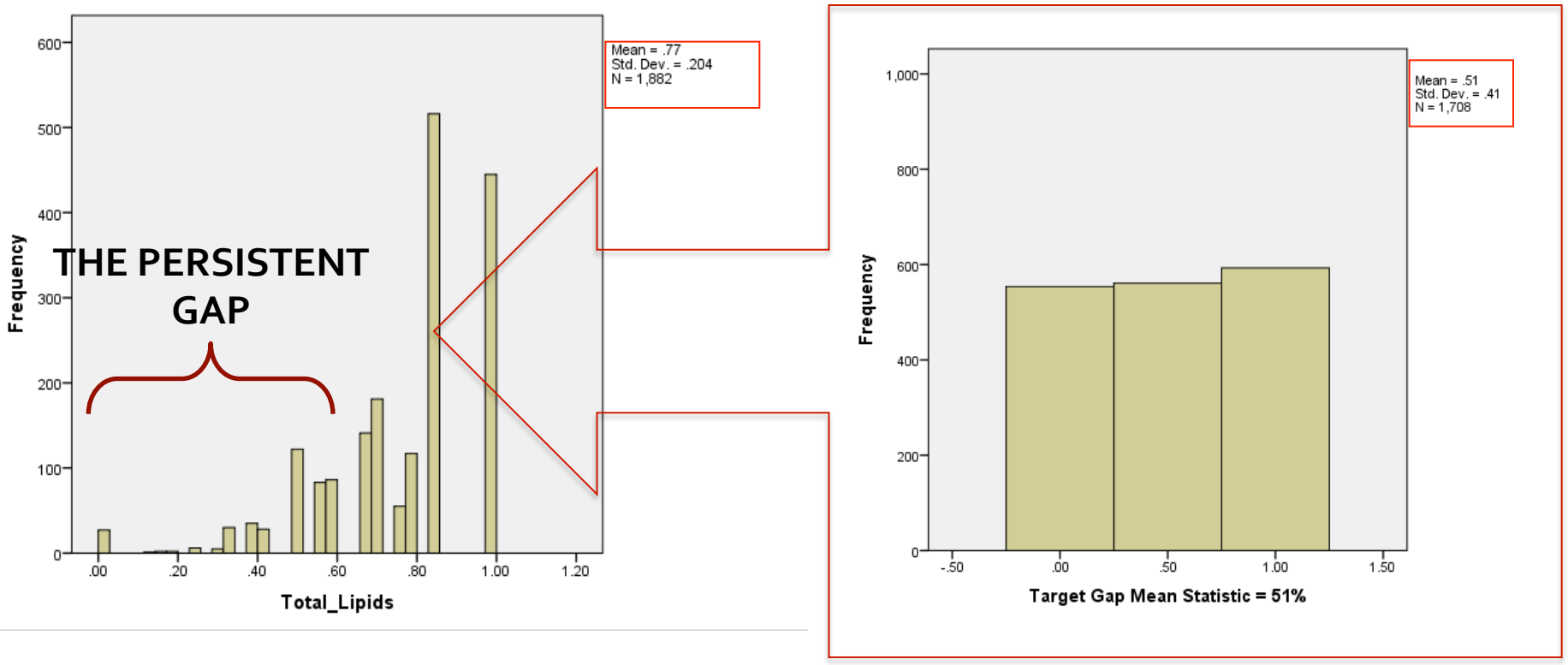
The Target-Gap Score

A significant gap was identified related to **the MOA** and **use of PCSK9 inhibitors** for reducing CVD risk. In order to identify the **specific drivers responsible for this gap** in learner proficiency, a composite target-gap score was created to model against.



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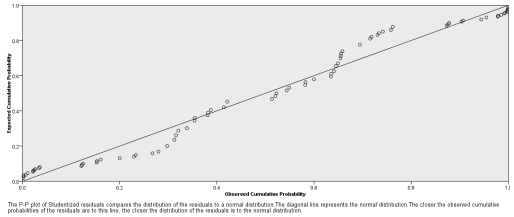
The Model: Identifying Significant Drivers

The Composite Gap Score serves as our **Target:**

All questions across the learning domains (including knowledge, competence, confidence, and practice strategy), as well as learner demographics were analyzed to identify positive and/or negative predictors of learners' target (or gap).

6 statistically significant drivers were identified, accounting for nearly 30% of the variance (individual scoring patterns) in the data:



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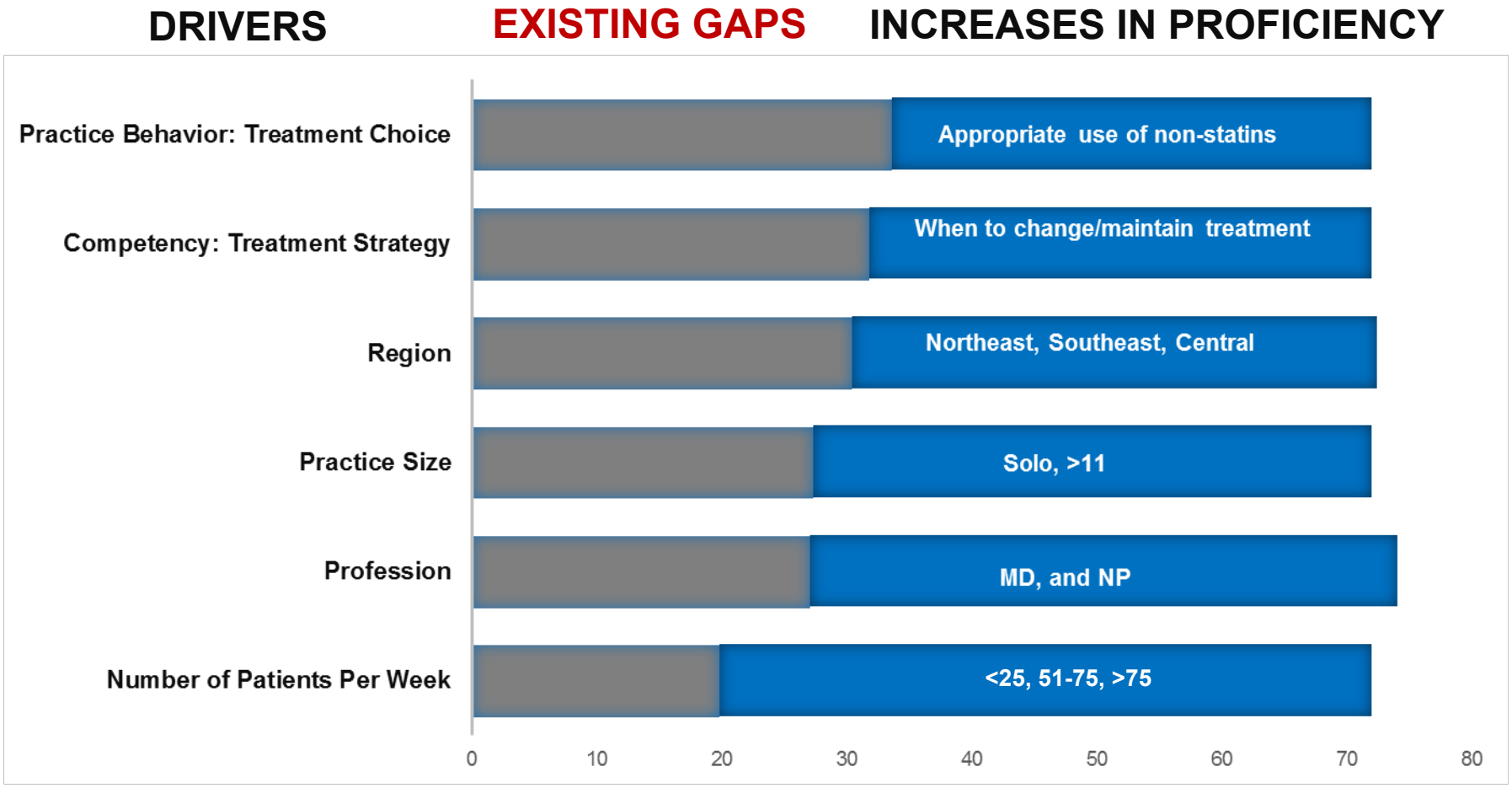
TARGET GAP SCORE: By addressing the below ***drivers with targeted education***, you can potentially ***increase*** learners' proficiency by a magnitude of 37%.



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Reducing CVD Risk: Summary of Findings

- Results revealed a significant and substantial gap concerning **mechanism of action and when to initiate treatment with PCSK9 inhibitors** to reduce risk of CVD.
- Learners demonstrated sustained retention of educational materials at four week follow-up.
  - Consistent with findings at Post-Test the learning gaps identified persisted demonstrating an ongoing educational need.
- The predictive modeling procedure identified 6 drivers that, if addressed in future education, will lead to an estimated 37**% (magnitude of change) improvement in learners' overall proficiency in this area**.
  - Drivers:
    1. **Performance – Appropriate use of non-statins**
    2. **Competency – When to modify or maintain current treatment(s)**
       1. Region (Demo) – Northeast, Southeast, Central
       2. Number of Patients Per Week – <25, 51-75, >75
       3. Profession –MD, NP
       4. Number of Providers – Solo, >11

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Reducing CVD Risk: Summary of Findings

Demographic drivers identified:

- Significant differences in:
  - Regional performance;
  - Performance based on the number of years in practice, and number of patients seen per week.
- Additionally, learners who identified as MDs and NPs showed less proficiency than PAs.

Drivers revealed the following gaps:

At Post-Test, **learners remained challenged** by the **mechanism of action** and **correct usage of PCSK-9 inhibitors**.

A predictive model was built to better understand **what is driving learners' difficulties** in these areas.

Key drivers identified indicate that additional education is needed that focuses not only on the **mechanism of action**, and **use of PCSK-9 inhibitors** (*the identified gap*), but also emphasizes appropriate **usage of non-statins**, including when to **change** or **maintain current treatments** to ***reduce CVD risk***.

What does this mean?

The existing curriculum addressed many areas of educational need, as evidenced by overall Post-Test performance; however, challenges remain. Developing and promoting further educational initiatives nationally to all healthcare providers responsible for the treatment of patients with CVD risk can close these gaps and improve patient outcomes.

Areas of Focus for Future Education

- Learners' performance from Pre- to Post-Test provides evidence for the value of curricula that emphasizes the importance of moving beyond statins for the reduction of risk for CVD; in particular, for the treatment of special populations. While the learners demonstrated substantial, statistically significant gains at Post-Test, significant challenges remain.
- Persistent gaps identified indicate that learners would benefit from the following education that emphasizes:
  1. **Mechanism of action of PSCK9 inhibitors.**
  2. **Usage of PSCK9 inhibitors to reduce risk of CVD.**
     1. Activities that enable the learner to evaluate and optimize treatment strategies for patients at risk for CVD would be particularly beneficial, eg. what-if scenarios.
     2. A particular emphasis on the appropriate use of non-statin therapies to reduce CVD risk would be extremely beneficial.