

# Prostate Cancer Screening in the Primary Care Setting: Understanding the Role of Bio-Markers



**A NACE Program  
Final Live Outcomes Report  
February 17, 2017**



# **Executive Summary**

Outcomes at Moore's Level 1-5





# Executive Summary

State	Attendees
016	276
MD 6	267
016	303
, NY 6*	411
, CA 16*	223
TX 16	207
FL 016**	185

Post and Live Conference  
 Updates for NPs & PAs Symposium

**93% of Attendees are Engaged in Direct Patient Care**



**1862**  
Total Attendees



**7 Cities**



**1651**  
On Site



**211**  
Remote Simulca

Outcome Indicator (matched learners only) (N=939)	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Ch
Knowledge	34.80% (39.92)	79.56% (33.32)	128.6
Competence	37.17% (48.36)	85.08% (35.65)	128.8
Confidence	2.32 (1.10)	3.72 (0.94)	60.3
Practice Strategy** (Performance)	2.94 (1.60)	4.44 (0.98)	51.0
RealIndex**	68.91% (30.01)	86.10% (24.93)	24.9

# Executive Summary

Learning Objective (matched learners only) (N=939)	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Change	P - Value
1. Recognize the prevalence and risk factors of prostate cancer	26.78% (44.31)	80.77% (39.44)	<b>201.61%</b>	< .0005
2. Compare the USPSTF, AUA and NCCN guidelines on screening	42.01% (49.32)	78.79% (40.90)	<b>87.55%</b>	< .0005
3. Understand the use of PSA and biomarkers	37.17% (48.36)	85.10% (35.65)	<b>128.95%</b>	< .0005
4. Develop a logical approach to screening for prostate cancer in a primary care setting	37.17% (48.36)	85.10% (35.65)	<b>128.95%</b>	< .0005

## Data Interpretation

Significant improvement occurred in the following areas:

- ◆ Recognition of prostate cancer risk and prevalence
- ◆ Awareness of screening guideline recommendations across different organizations
- ◆ Strategies to utilize biomarkers and PSA testing
- ◆ Logical approaches to screening for Prostate Cancer

Significant gaps remain concerning Prostate Cancer screening protocols



# Executive Summary



## Recommendations for Future Education

The identified gaps can be accomplished by:

Revising content on competency and performance behaviors related to screening protocol for prostate cancer including:

- Biopsy
- Use of biomarkers
- Surgical evaluation
- When to do nothing
- Screening guidelines
- Shared decision making
- Education that improves Knowledge regarding lifetime risk of diagnosis and mortality

## Future Education Design

- ◆ Program design to close gaps might incorporate case-based activities emphasizing screening protocol for patients suspected to have prostate cancer with an emphasis on the use of biomarkers
- ◆ Education that focuses on guidelines for screening, including when to use more invasive procedures
- ◆ Serial reinforcement to address retention concerning the screening of prostate cancer and confidence
- ◆ Include a team-based approach to screening of prostate cancer using case-based challenges to engage entire care team (profession & specialty)





# Curriculum Overview



**Regional Symposia Launch Date: April 30, 2016 through October 29, 2016**

Five live symposia were held in 7 cities.

The daylong program may be simulcast in one of the cities.

**Learning Symposium Webcast: Launch Date: October 15, 2016 End Date: October 14, 2017**

[http://naceonline.com/CME-Courses/course\\_info.php?course\\_id=796](http://naceonline.com/CME-Courses/course_info.php?course_id=796)



# Cities and Dates

Emerging Challenges In Primary Care: 2016

\*Clinical Updates for Nurse Practitioners and Physician Assistants: 2016

**Miami, Florida**  
**April 30, 2016**

**Uniondale, New York**  
**October 8, 2016**

**Orlando, Florida\***  
**September 17, 2016**

**Baltimore, Maryland**  
**May 7, 2016**

**San Diego, California**  
**October 22, 2016**

**Tampa, Florida**  
**June 25, 2016**

**Houston, Texas**  
**October 29, 2016**

# Learning Objectives

1. Recognize the prevalence and risk factors of prostate cancer
2. Compare the USPSTF, AUA and NCCN guidelines on screening
3. Understand the use of PSA and biomarkers
4. Develop a logical approach to screening for prostate cancer in a primary care setting





# ReportIndex

1	<b>Methodology</b>	<ul style="list-style-type: none"><li>• Activity Level</li><li>• Curriculum Level</li><li>• Predictive Modeling</li></ul>
2	<b>Executive Summaries Moore's Levels 1 - 5</b>	<ul style="list-style-type: none"><li>• Participation</li><li>• Learning Domains</li><li>• Outcomes Analyses Overview</li></ul>
3	<b>Level 1 (Participation)</b>	<ul style="list-style-type: none"><li>• Professional and Specialist<ul style="list-style-type: none"><li>• Curriculum Starts</li><li>• Content Completions</li><li>• Certificates</li></ul></li></ul>
5	<b>Level 1</b>	<ul style="list-style-type: none"><li>• Demographics</li><li>• Curriculum Patient Reach</li></ul>
6	<b>Levels 3-5</b>	<ul style="list-style-type: none"><li>• Learning Domains</li><li>• Learning Objectives</li><li>• The RealIndex</li></ul>
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10	<b>Curriculum Summary of Results</b>	<ul style="list-style-type: none"><li>• Summary of Curriculum Findings</li></ul>



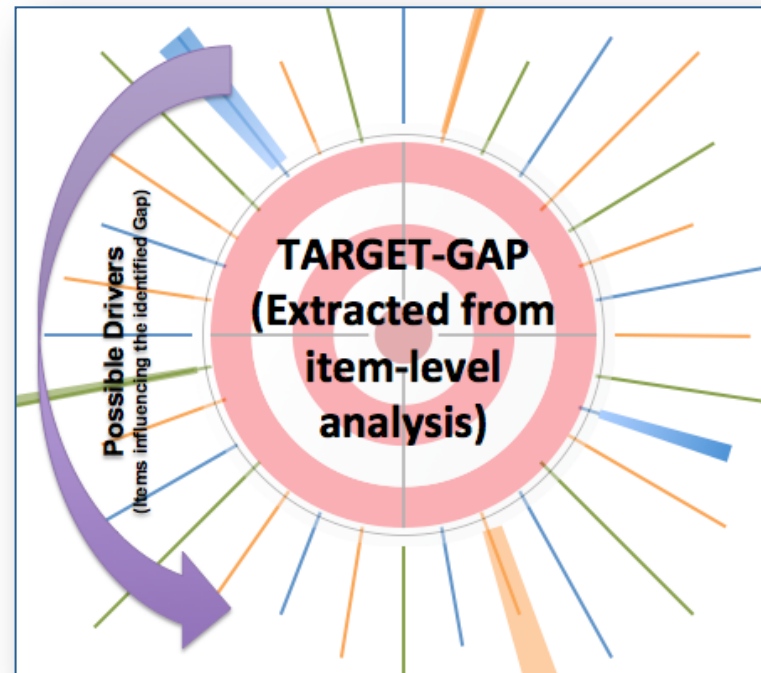
# Outcomes Assessment Methodology

- Data collection:
  - Paired **Pre- and Post-Test** questions
  - **Demographic** questions
  - Learner **Challenge** questions
- Employs **Knowledge, Competence, Confidence, and practice strategy** question types
- Appropriate statistics applied to assess change across learning domains

- Establish a **Target-Gap composite score**
- ALL Post-Test items and demographic variables make-up possible **drivers**
- Algorithms narrow down most important drivers influencing the Target-Gap to be addressed in future content

## CURRICULUM OUTCOMES PROTOCOL

- Assess Moore's Levels 1–5
- **Learning objective** analysis
- Multi-dimensional **repeated-measure** (Level 5):
  - Prior to activity/after completion of each activity
  - Post-curriculum assessment survey



# RealMeasure® Outcomes Assessment Methodology

The methodology utilized by RealCME, known as RealMeasure®, utilizes a sophisticated approach to measuring impact on the intended learner cohorts, analyzing pre/post and 4-week follow-up learner data in concert with a curriculum-based, multidimensional, index-based metric that serves as a surrogate marker for performance (the RealIndex). These analyses include paired-samples t tests, correlations, non-parametric testing, as well as opportunities for advanced analytics.

## RealIndex

An **objective** metric (scored from 0% - 100%) that serves as a surrogate measure of performance.

The RealIndex has been validated against EHR data over the past 7 years, producing consistently high alphas of (0.8-0.9) having been assessed on over 200 curricula thus confirming it as a valid and reliable surrogate performance metric.

## Knowledge & Competence

**Objective** assessments that are scored on a scale of 0%-100%.

These metrics measure evidenced-based knowledge, application of best clinical practice (s); as well as interpretation and application of clinical trial data to current practice.

## Confidence & Practice Strategy

**Subjective** assessments measured on a 5-point Likert scale. The learner provides ratings for their confidence and current practice strategy.

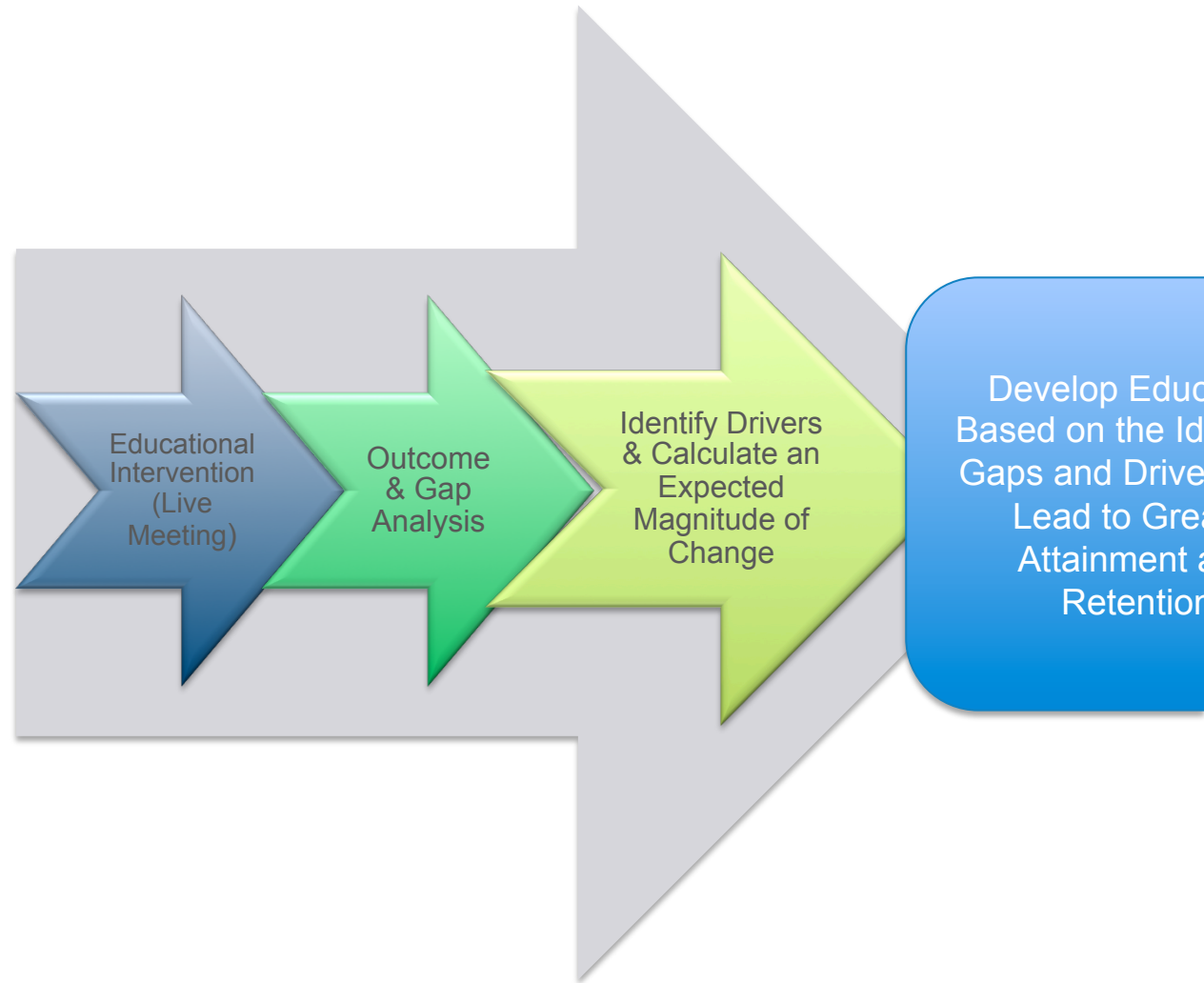
These assessments are correlated with the scored (objective) metrics to provide additional statistical support to any identified gaps or areas of mastery.



# Predictive Modeling Methodology

Predictive modeling was employed following the live meetings to identify the significant drivers that can be used to address additional educational needs of learners, Post-Test.

This approach enables educators to develop interventions that are more robust; leading to greater attainment and better retention.



# Executive Summary

## Outcomes at Moore's Levels 1-5

\*Emerging Challenges; \*\* Clinical Updates

Level 1 (Participation):

Live Meeting Location (Date) <sup>1</sup>	Attendees	Simulcast	Started Pre-Test	Started Post-Test	
Miami, FL (April 30, 2016) <sup>+</sup>	276	-	187	162	<b>86.63%</b>
Baltimore, MD (May 7, 2016) <sup>+</sup>	267	-	171	196	<b>87.24%</b>
Tampa, FL (June 25, 2016) <sup>+</sup>	303	-	165	194	<b>85.05%</b>
Uniondale, NY (Oct. 8, 2016) <sup>+</sup>	291	120	173	180	<b>96.11%</b>
San Diego, CA (Oct. 22, 2016) <sup>+</sup>	122	91	68	81	<b>83.95%</b>
Houston, TX (Oct. 29, 2016) <sup>+</sup>	207	-	105	132	<b>79.55%</b>
Orlando, FL (Sept. 17, 2016) <sup>++</sup>	185	-	70	69	<b>98.57%</b>
<b>Total Learners:</b>	<b>1651</b>	<b>1862</b>	<b>939</b>	<b>989</b>	<b>94.94%</b>

**Level 2 (Satisfaction):** Participants' comments and self-reports reflect a high level of satisfaction with the curriculum and indicate that the content was relevant to their practice.

**Levels 3-5 (Knowledge, Competence, Confidence, and Performance):** Statistically significant gains were measured from Pre-Test across the program, in all learning domains.

Outcome Indicator (matched learners only)	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Change
Knowledge	34.80% (39.92)	79.56% (33.32)	<b>128.62%*</b>
Competence	37.17% (48.36)	85.08% (35.65)	<b>128.89%*</b>
Confidence	2.32 (1.10)	3.72 (0.94)	<b>60.34%*</b>
Practice Strategy**	2.94 (1.60)	4.44 (0.98)	<b>51.02%*</b>
ReallIndex**	68.91% (30.01)	86.10% (24.93)	<b>24.95%*</b>

\* Results are statistically significant  $p < .05$ ; \*\*Performance metric

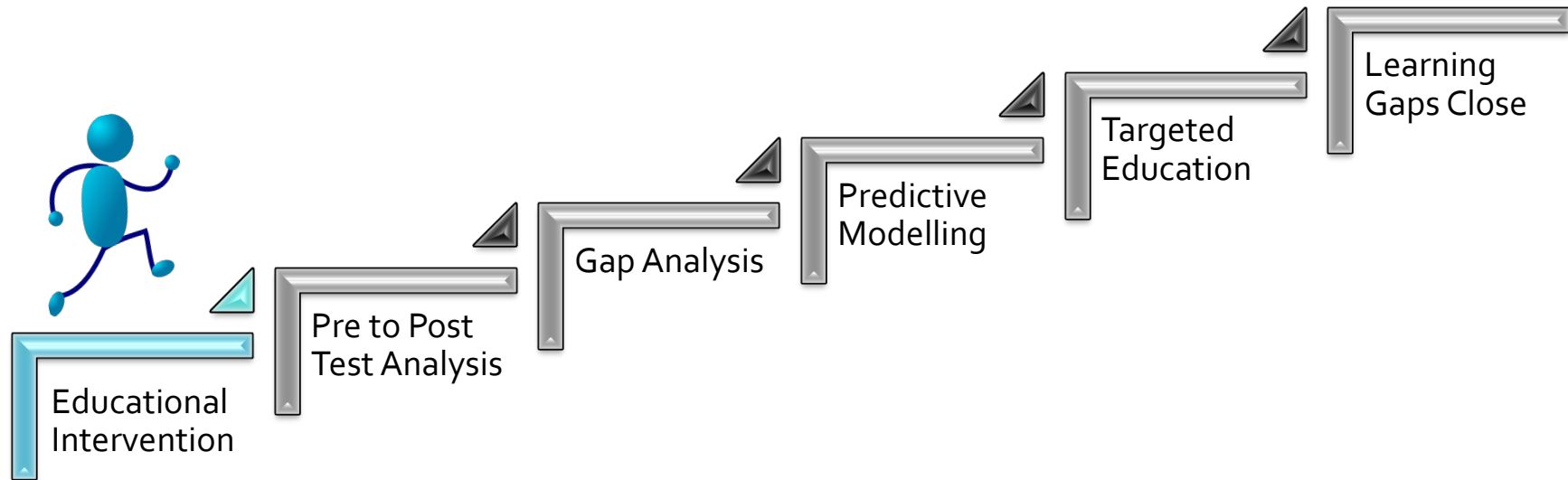


## Level 2: Satisfaction

- 99% rated the activity as excellent
- 100% indicated the activity improved their knowledge
- 99% 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

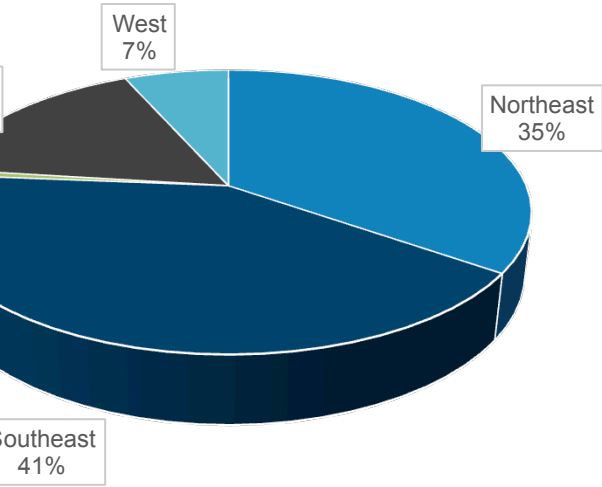


# Level 1: Demographics

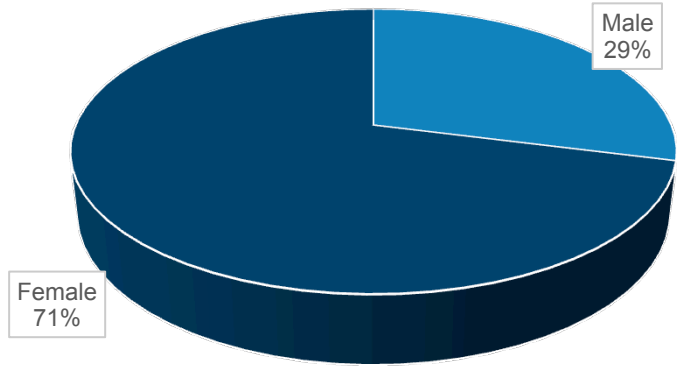


# Level 1: Participation – Demographics

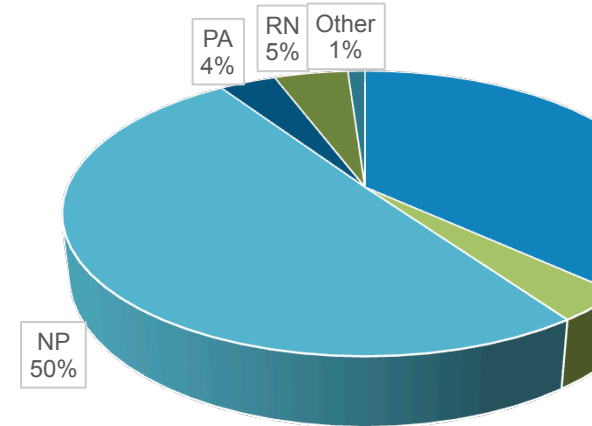
### Region



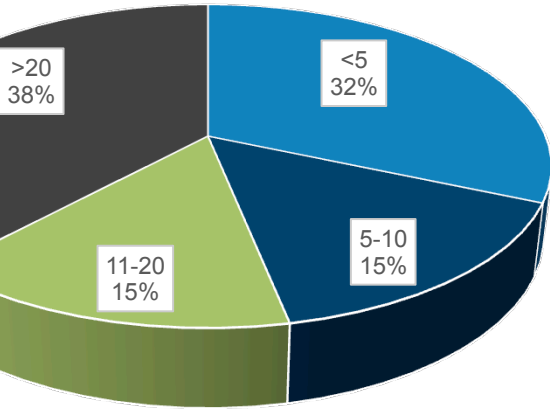
### Gender



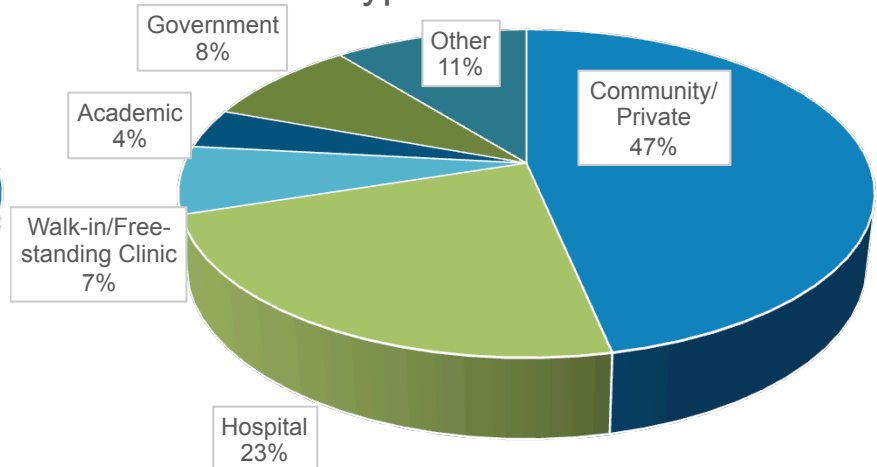
### Profession



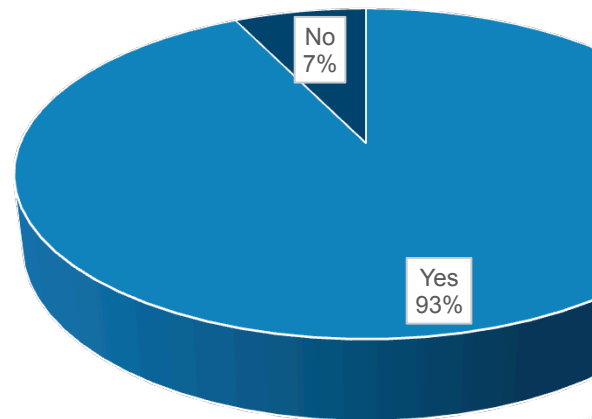
### Yrs in Practice



### Type of Practice

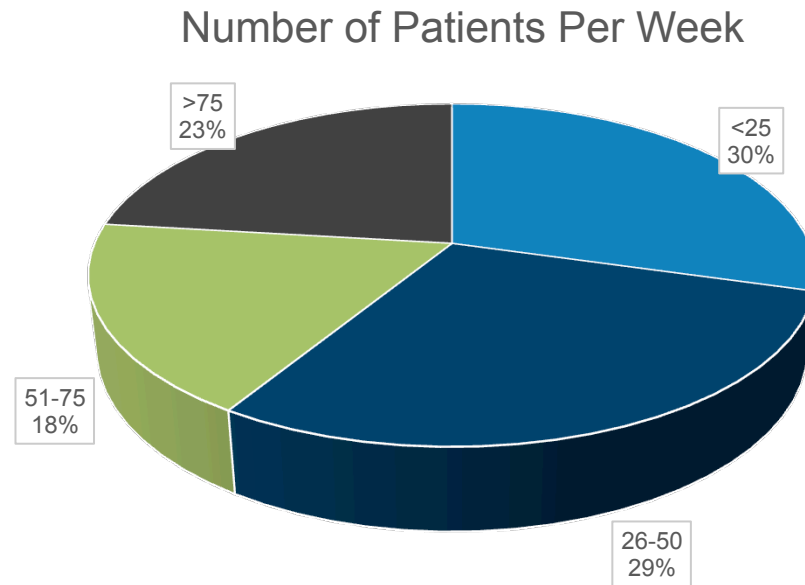
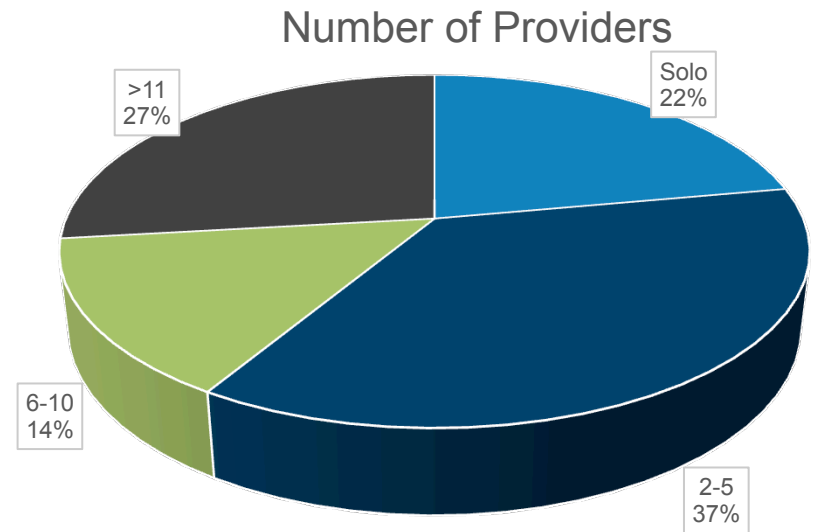
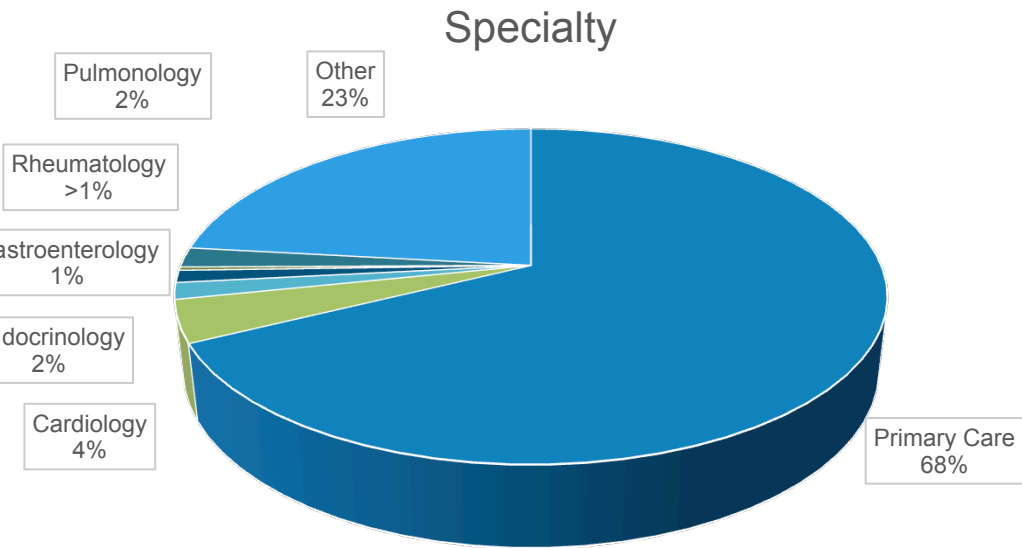


### Practice Devoted to Patient Care

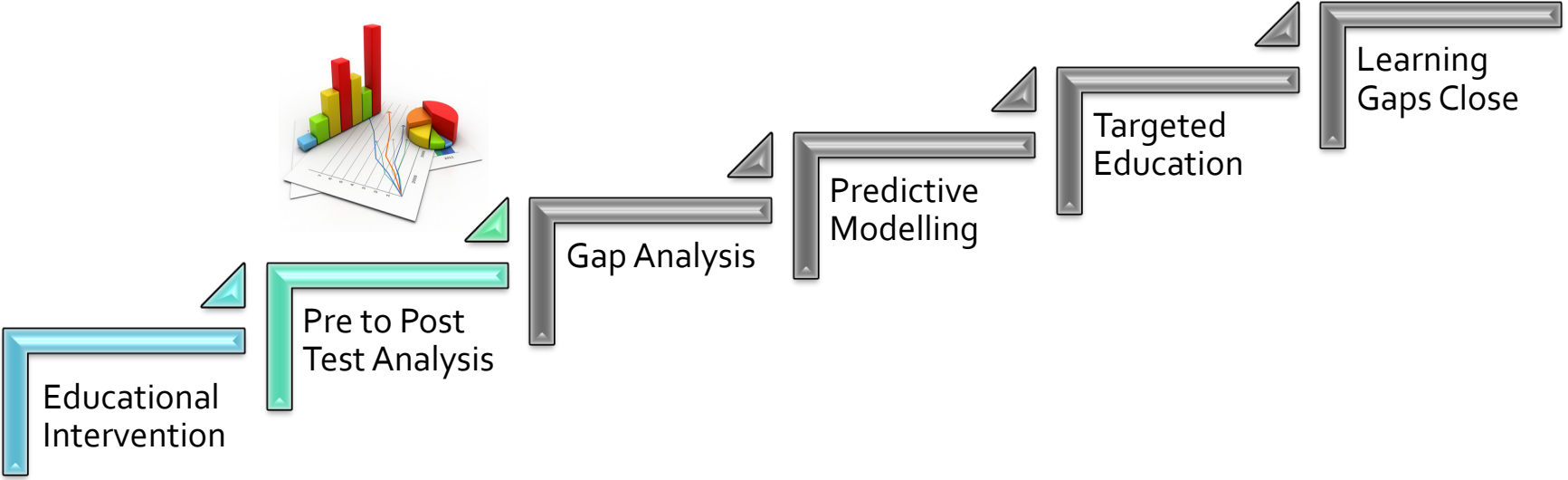




# Level 1: Participation – Demographics

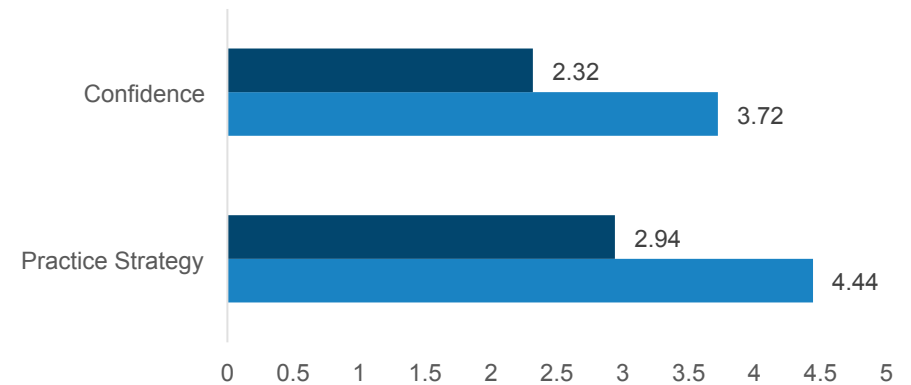
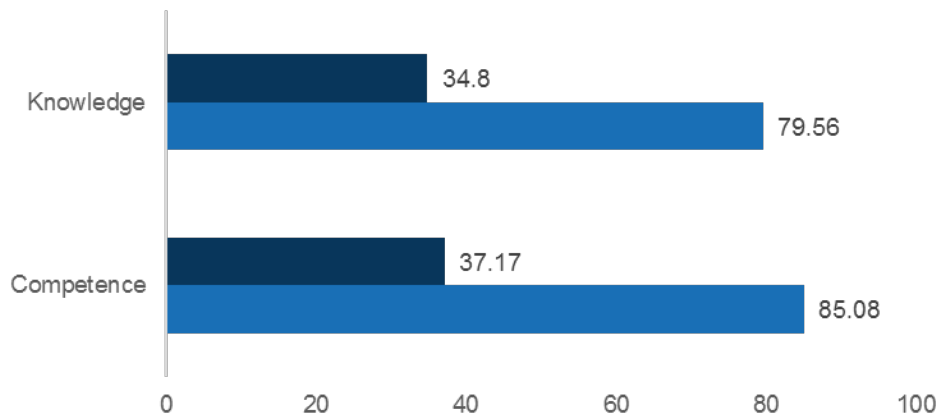


# Levels 3-5: Outcomes Metrics



# Levels 3-4 - Learning Domain Summary

Outcome Indicator	Pre-Test	Post-Test	SDS = Standard Deviation Score	
	Avg. Score (SDS)	Avg. Score (SDS)	% Change	P - Value
Knowledge	34.80% (39.92)	79.56% (33.32)	<b>128.62%</b>	< .0005
Competence	37.17% (48.36)	85.08% (35.65)	<b>128.89%</b>	< .0005
Confidence	2.32 (1.10)	3.72 (0.94)	<b>60.35%</b>	< .0005
Practice strategy	2.94 (1.60)	4.44 (0.98)	<b>51.02%</b>	< .0005



- Statistically significant and substantial gains ( $p < .0005$ ) were achieved across the curriculum in all domains from relatively low Pre-Test averages.
- Learner score scatter (SDS) improved to more moderate levels by Post-Test suggesting that learners' responses were more consistent with the mean.
- These Pre- to Post-Test percentage changes were primarily above established benchmarks, which estimate gains range from 15% to 20% by Post-Test.



# Level 3 - Learning Objectives

Learning Objective	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Change	P - Value
1. Recognize the prevalence and risk factors of prostate cancer	26.78% (44.31)	80.77% (39.44)	<b>201.61%</b>	< .0005
2. Compare the USPSTF, AUA and NCCN guidelines on screening	42.01% (49.32)	78.79% (40.90)	<b>87.55%</b>	< .0005
3. Understand the use of PSA and biomarkers	37.17% (48.36)	85.10% (35.65)	<b>128.95%</b>	< .0005
4. Develop a logical approach to screening for prostate cancer in a primary care setting	37.17% (48.36)	85.10% (35.65)	<b>128.95%</b>	< .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 88% to over 200%.
- LO 1, 3, and 4 demonstrated the greatest gain by Post-Test (129% - 201%) from the lowest Pre-Test averages.
  - LO2 also showed a substantial gain of 88%.
- The Pre- to Post-Test percentage changes observed were above historical benchmarks, which show average estimates of 20% by Post-Test.



# Level 5 Performance Metric: The RealIndex

A 61-year-old man with a history of obesity (BMI 32.4 kg/m<sup>2</sup>), hypertension, and dyslipidemia presents for a checkup. Previous tests for serum PSA levels produced the following results: 0.91 mg/mL 3 years ago and 1.3 ng/mL 2 years ago. His PSA today is 3.0 ng/mL.

Digital rectal examination finds 30 g prostate with no nodules. Current medications include lisinopril/hydrochlorothiazide 20/25 mg qd and atorvastatin 40 mg qd.

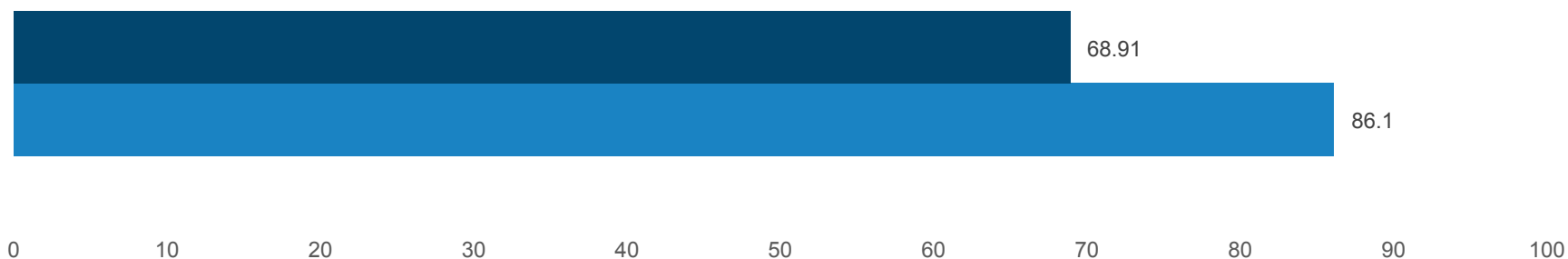
*After reviewing the brief scenario above, please rate each of the following statements as consistent with or not consistent with best clinical practice for prostate cancer screening:*

<b>Consistent</b>	<b>Not Consistent</b>
Consider ordering a biomarker.	Perform biopsy of prostate.
	Perform no further testing at this time.
	Refer for surgical evaluation.



# 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
1148	68.91% (30.00)	86.10% (24.93)	<b>25.00%</b>	<.0005	.618	38.91%	1.00



A substantial and significant gain (25.00%,  $p < .0005$ ) was measured from baseline to the final RealIndex which resulted in a large effect size ( $d = .618$ ) with a non-overlap of 38.91%. This result demonstrated a high degree of statistical power (1.00).

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



# Levels 3-5 - Learning Domain Summary: By Location

\*\* Performance metric

	Outcome Indicator	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Change	P - Value
Baltimore (N =203)	Knowledge	40.91% (40.03) →	71.31% (36.84)	74.31%	< .0005
	Competence	27.52% (44.81)	82.55% (38.08)	199.96%	< .0005
	Confidence	2.14 (1.03)	3.62 (0.99)	69.16%	< .0005
	Practice**	3.19 (1.53)	4.34 (1.08)	36.10%	< .0005
	ReallIndex**	64.37% (26.62)	85.14% (22.26)	32.27%	< .0005
Houston (N =130)	Knowledge	39.02% (39.74) →	80.89% (31.05)	107.30%	< .0005
	Competence	26.74% (44.52) →	86.05% (34.85)	221.80%	< .0005
	Confidence	2.37 (0.96)	3.81 (0.85)	60.76%	< .0005
	Practice**	2.95 (1.59)	4.58 (0.73)	55.25%	< .0005
	ReallIndex**	68.72% (27.55)	92.37% (17.94)	34.42%	< .0005
Miami(N = 198)	Knowledge	29.04% (34.21)	75.51% (34.81)	160.02%	< .0005
	Competence	57.06% (49.65) →	89.41% (30.86)	56.69%	< .0005
	Confidence	2.71 (1.22)	3.73 (0.87)	37.64%	< .0005
	Practice**	2.34 (1.54)	4.17 (1.30)	78.21%	< .0005
	ReallIndex**	69.52% (33.94)	84.47% (28.21)	21.50%	< .0005
San Diego (N =79)	Knowledge	39.86% (42.980)	78.38% (35.19)	96.64%	< .0005
	Competence	30.00% (46.21) →	83.33% (37.58)	177.77%	< .0005
	Confidence	2.38 (1.20)	3.68 (0.93)	54.62%	< .0005
	Practice**	3.11 (1.65)	4.72 (0.53)	51.77%	< .0005
	ReallIndex**	70.46% (27.47)	80.80% (28.38)	14.67%	< .02



## Levels 3-5 - Learning Domain Summary: By Location

	Outcome Indicator	Pre-Test Avg. Score (SDS)	Post-Test Avg. Score (SDS)	% Change	P - Value
Tampa (N = 221)	Knowledge	28.04% (40.04) →	85.98% (28.75)	206.63%	< .0005
	Competence	35.97% (48.17)	77.70% (41.78)	116.01%	< .0005
	Confidence	2.48 (1.04)	3.90 (0.93)	57.26%	< .0005
	Practice**	2.89 (1.41)	4.39 (0.83)	51.90%	< .0005
	ReallIndex**	70.21% (28.30)	87.86% (24.33)	25.14%	< .0005
Uniondale (N = 212)	Knowledge	33.70% (40.01) →	78.45% (35.43)	132.80%	< .0005
	Competence	30.58% (46.27)	90.91% (28.87)	197.29%	< .0005
	Confidence	1.90 (0.96)	3.56 (1.00)	87.68%	< .0005
	Practice**	3.31 (1.50)	4.65 (0.78)	40.48%	< .0005
	ReallIndex**	70.01% (28.15)	82.94% (25.50)	18.50%	< .0005
Orlando (N = 119)	Knowledge	43.04% (45.81)	94.30% (17.88)	119.10%	< .0005
	Competence	46.15% (50.50) →	84.62% (36.55)	83.36%	< .0005
	Confidence	2.28 (0.84)	3.76 (0.97)	64.91%	< .0005
	Practice**	3.53 (1.60)	4.70 (0.60)	33.14%	< .0005
	ReallIndex**	70.52% (38.29)	89.29% (26.59)	26.62%	< .0005

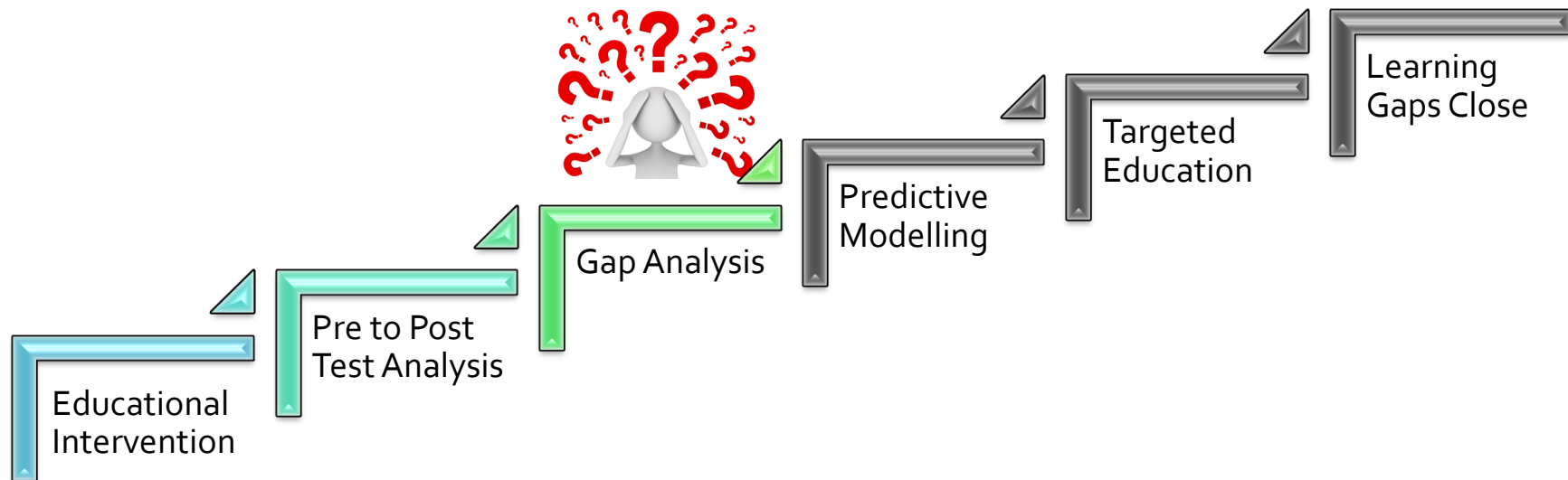
\*\* Performance metric





# Item-Level/Gap Analysis

(Including Analysis of Demographic Correlations)





# Knowledge

## Question Estimated Risk (LO 1)

What is the estimated lifetime risk for prostate cancer *diagnosis* and *mortality* for men in the United States?

Correct Answer	Choice	Pre-Test (N = 877)	Post-Test (N = 1012)
	1. 8%, 1%	8.5%	7.3%
<b>X</b>	<b>2. 17%, 3%</b>	<b>26.9%</b>	<b>79.4%</b>
	3. 25%, 7%	42.8%	9.6%
	4. 31%, 11%	21.8%	3.75

## Question Recommend Screening (LO 2)

Which of the following organizations recommends PSA screening of men aged 55-69 years or  $\geq 70$  years with a 10-15-year life expectancy?

Correct Answer	Choice	Pre-Test (N = 962)	Post-Test (N = 1019)
<b>X</b>	<b>1. American Urological Association</b>	<b>41.3%</b>	<b>78.5%</b>
	2. American Cancer Society	34.1%	8.2%
	3. American Academy of Family Physicians	15.7%	7.4%
	4. National Comprehensive Cancer Network	8.9%	5.9%



**Question** Understand use of biomarkers (LO 3,4)

A 49-year-old man in overall good health presents for a checkup. He notes that his father died of prostate cancer and asks if he should be screened for prostate risk. Digital rectal examination finds 20 g prostate with no nodules. Serum PSA is 1.7 ng/mL.

**Which of the following might be appropriate at this time?**

Correct Answer	Choice	Pre-Test (N = 961)	Post-Test (N = 1070)
	1. No other tests	15.7%	3.5%
	2. Refer for biopsy	12.1%	1.2%
	3. Retest serum PSA annually	36.7%	11.3%
<b>X</b>	<b>4. Consider biomarker</b>	<b>35.5%</b>	<b>84.0%</b>

# Confidence

## Question Screening

Please rate your confidence in your ability to screen male patients for prostate cancer (based on a scale of 1 to 5, with 1= “Not at all confident” and 5= “Very confident”).

Choice	Pre-Test (N = 1053)	Post-Test (N = 1113)
Not at all confident	24.8%	1.3%
Slightly confident	34.9%	8.9%
Moderately confident	27.7%	28.5%
Pretty much confident	8.2%	39.1%
Very confident	4.4%	22.2%



Learners’ self-reported Confidence at Pre-Test was fairly low, with learner responses largely ranging from ‘not confident at all’ to only ‘moderately confident’. Post-Test Confidence improved by 60%, providing evidence that the curriculum met an area of educational need.



# Practice Strategy

## Question [Inclusion of biomarkers](#)

How often do/will you test for prostate cancer biomarkers in men with abnormal serum PSA levels?

(based on a scale of 1 to 5, with 1= “Never” and 5= “Always”)?

Choice	Pre-Test (N = 921)	Post-Test (N = 1026)
Never	30.4%	3.3%
Rarely	9.4%	1.9%
Sometimes	18.2%	8.1%
Often	18.0%	19.6%
Always	23.95	67.2%



At Pre-Test, learners’ self-reported practice strategy was quite varied; however, at Post-Test the majority of learners reported that they were very likely or always going to test for prostate cancer biomarkers in men with abnormal serum PSA levels which represent a 51% change in practice strategy.





## The RealIndex

A 61-year-old man with a history of obesity (BMI 32.4 kg/m<sup>2</sup>), hypertension, and dyslipidemia presents for a checkup. Previous tests for serum PSA levels produced the following results: 0.91 mg/mL 3 years ago and 1.3 ng/mL 2 years ago. His PSA today is 3.0 ng/mL.

Digital rectal examination finds 30 g prostate with no nodules. Current medications include lisinopril/hydrochlorothiazide 20/25 mg qd and atorvastatin 40 mg qd.

*After reviewing the brief scenario above, please rate each of the following statements as consistent with or not consistent with best clinical practice for prostate cancer screening:*

### Consistent

Consider ordering a biomarker.  
**(78.91% BL → 95.27% FINAL)**

### Not Consistent

Perform biopsy of prostate.  
**(51.63% BL → 78.64% FINAL)**

Perform no further testing at this time.  
**(74.91% BL → 83.42% FINAL)**

Refer for surgical evaluation.  
**(69.25% BL → 87.41% FINAL)**

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

## Question 1 Screening Guidelines

Which set of guidelines do you rely on most when considering prostate cancer screening for your patients?

Correct Answer	Choice	Internal Item (N = 904)
	1 American Urological Association	30.4%
	2 US Preventive Services Task Force	47.2%
	3 American Academy of Family Physicians	16.3%
	4 National Comprehensive Cancer Network	6.1%

## Question 2 Large-scale Screening Studies

Large-scale studies of prostate cancer screening using serum PSA levels have consistently demonstrated no mortality benefit to routine screening:

Correct Answer	Choice	Internal Item (N = 900)
	1 True	67.9%
	2 False	32.1%



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

## Question 3 Shared Decision Making

How often do you use techniques of shared decision making when discussing serum PSA results with patients:

Correct Answer	Choice	Internal Item (N = 858)
	1 Never	29.6%
	2 Rarely	17.8%
	3 Sometimes	21.4%
	4 Often	15.7%
	5 Always	15.4%

The results of the additional, non-matched ARS questions indicate that:

1. Learners do not rely on one set of guidelines when screening for prostate cancer; the majority indicated they use either American Urological Association (30%) or US Preventive Services Task Force (47%) guidelines.

2. The majority of learners selected “True” indicating that there is no mortality benefit to routine PSA serum screening for prostate cancer according to large-scale research studies.

3. The majority of learners do not currently engage in SDM techniques when discussing serum PSA results with patients with the majority indicating they either *Never* (30%), *Rarely* (18%), or only *Sometimes* (21%) engage in SDM.



# Summary of Outcomes Analyses (Levels 1-5)

**Robust 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.

- Learners demonstrated a substantial increase in proficiency from Pre - to Post-Test for Knowledge and Competence.
  - **Knowledge** average scores increased from **35%** (Pre-Test) to **80%** (Post-Test).
  - **Competence** average scores improved from **33%** (Pre-Test) to **85%** (Post-Test).
    - These improvements represent gains of nearly **130%** for both Knowledge and Competence.
  - **RealIndex** average scores improved from 68% (Pre-Test) to 86% (Post-Test).
- While **Confidence** ratings were low at Pre-Test, by Post-Test learners achieved a significant increase in Confidence regarding their ability to successfully screen for prostate cancer.
- At Post-Test, the majority of learners indicated their **practice strategy** would be to test for prostate cancer biomarkers in men with abnormal PSA levels *often* or *always*.



# Correlation Analysis

- A inverse relationship was observed for **Post-Test Knowledge** and **years in practice**. In particular, learners practicing >20 scored well below all other categories with averages of 69%. Those practicing 5-10 years achieved the highest average of 90%, at Post-Test, suggesting that experience did not facilitate performance.
- **Pre-Test Confidence** was correlated with **gender** and **profession**:
  1. Males reported higher levels of Confidence than females
  2. MDs reported the highest level of Confidence, and RNs the lowest
- **Gender** and **profession** were positively correlated with the majority of male learners identifying as MDs (78%), whereas females identified their profession as NPs (66%).



# Summary of Gap Analysis

While learners achieved robust statistically significant and substantial gains across all domains of the curriculum, there were areas where learners lacked proficiency at Post-Test:

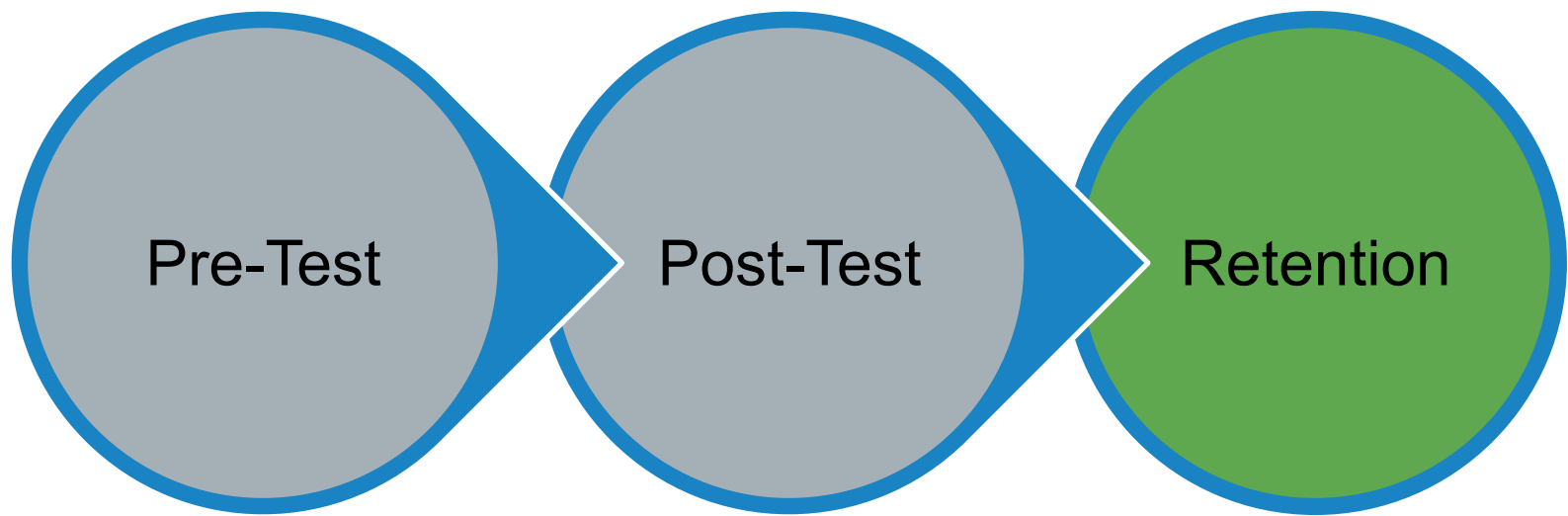
## Performance Metric: The RealIndex

Old man with a history of obesity (BMI 32.4 kg/m<sup>2</sup>), hypertension, and diabetes presents for a checkup. Previous tests for serum PSA levels were the following results: 0.91 mg/mL 3 years ago and 1.3 ng/mL 2 years ago. His PSA today is 3.0 ng/mL. Digital rectal examination finds 30 g prostate with no nodules. Current medications include lisinopril/hydrochlorothiazide 20/25 mg qd and aspirin 81 mg in 40 mg qd. *Following the brief scenario above, please rate each of the following responses as consistent with or not consistent with best clinical practice for prostate cancer screening:*

	Not Consistent
Performing a biomarker.	Perform biopsy of prostate.
	Perform no further testing at this time.
	Refer for surgical evaluation.

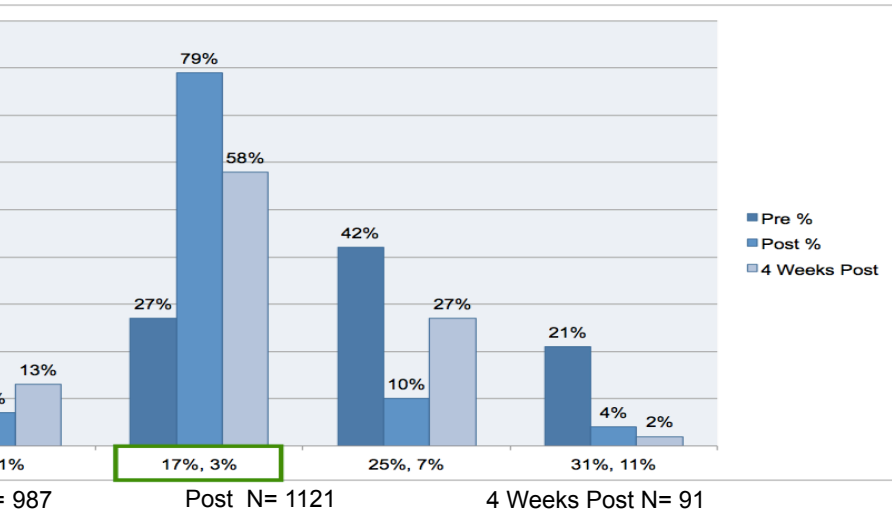
- Performance behavior (RealIndex)** related to decision making regarding the use of biopsy proved challenging for learners at Post-Test, with nearly 25% of learners incorrectly indicating they would perform a prostate biopsy.
  - Nearly 20% of learners indicated they would do no testing at this time.
- Knowledge** of UAU guidelines for PSA screening in men aged 55-69 years or ≥70 years with a 10-15-year life expectancy; approximately 25% answered incorrectly at Post-Test.
- While **Confidence** improved significantly, learners would benefit from education that reinforces screening guidelines including the use of biomarkers when screening patients for prostate cancer.



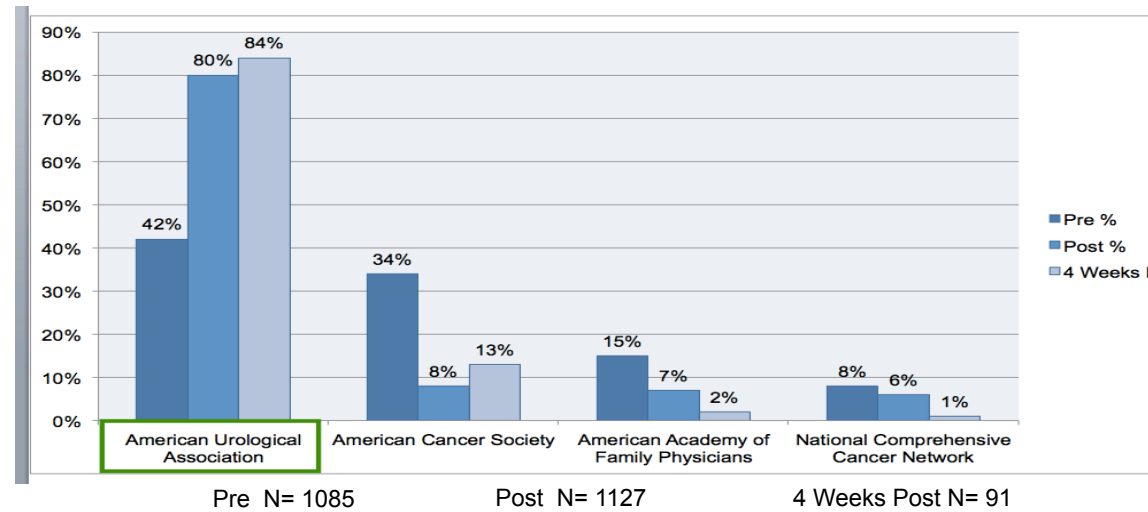


# Four Week Post Symposium Questions

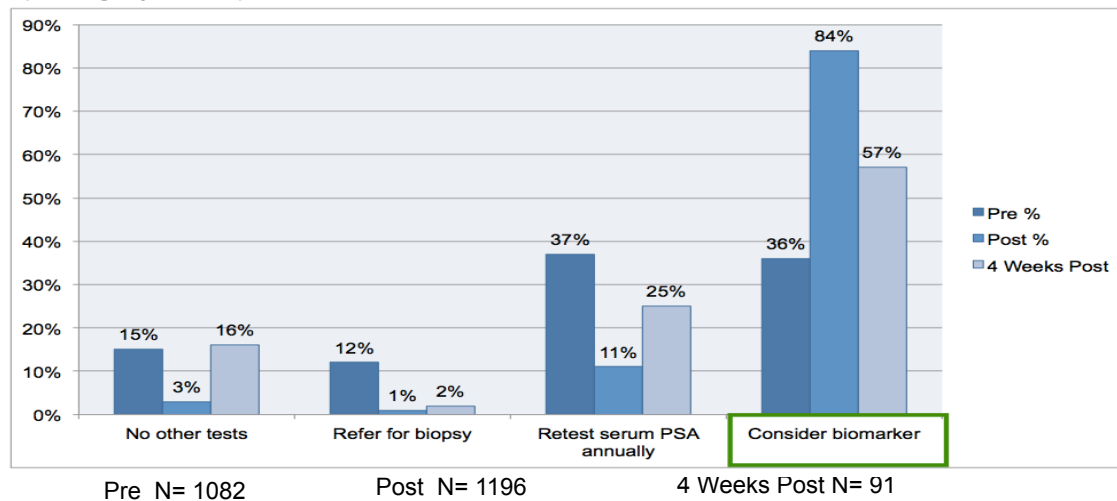
What is the estimated lifetime risk for prostate cancer *diagnosis* and *death* for men in the United States? (Learning Objective 1)



Which of the following organizations recommends PSA screening of men aged 55-69 years or  $\geq 70$  years with a 10-15-year life expectancy? (Learning Objective 2)



Which of the following organizations recommends PSA screening of men aged 55-69 years or  $\geq 70$  years with a 10-15-year life expectancy? (Learning Objective 2)



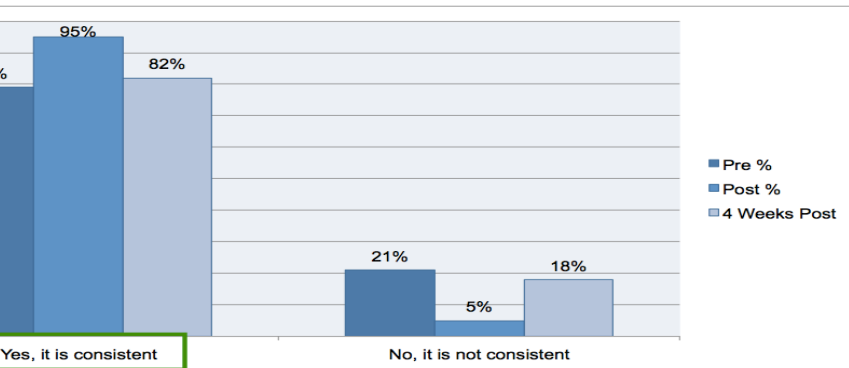
# Four Week Post Symposium Questions

67-year-old man with a history of obesity (BMI 32.4 kg/m<sup>2</sup>), hypertension, and dyslipidemia presents for a checkup. Previous tests for serum PSA levels produced the following results: 3.0 ng/mL 3 years ago and 1.3 ng/mL 2 years ago. His PSA today is 3.0 ng/mL.

Digital rectal examination finds 30 g prostate with no nodules. Current medications include lisinopril/hydrochlorothiazide 20/25 mg qd and atorvastatin 40 mg qd.

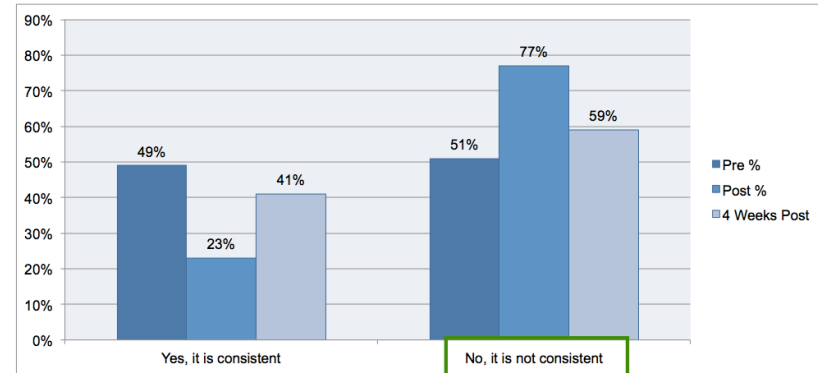
After reviewing the brief scenario above, please rate each of the following statements as **consistent** with or **not consistent** with best clinical practice for prostate cancer screening.

## Consider ordering a biomarker.



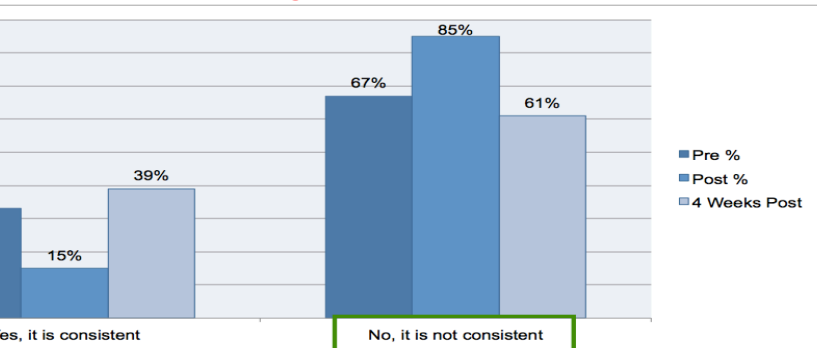
Pre N= 1067; Post N= 1131; 4 Weeks Post N= 91

## Perform biopsy of prostate.



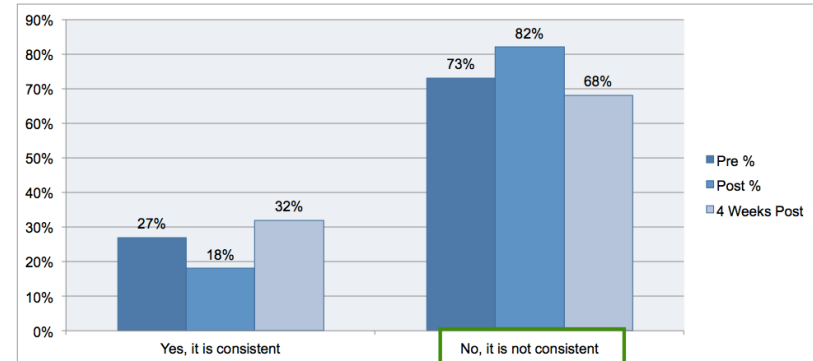
Pre N= 958 Post N= 972 4 Weeks Post N= 91

## Refer for surgical evaluation



Pre N= 1036 Post N= 1036 4 Weeks Post N= 91

## Perform no further testing at this time



Pre N= 907 Post N= 842 4 Weeks Post N= 91

# Four Week Case Post Symposium Questions Analysis

## Knowledge & Competence

- Learners demonstrated excellent retention for Knowledge relating to screening criteria set forth by the American Urological Association; in fact their performance improved slightly at the 4 week follow-up.
  - Slippage was observed for items related to the estimated risk for prostate cancer diagnosis and mortality rates.
- Substantial slippage was observed for Competence; learners' struggled to recall when to consider the use of biomarkers as part of the screening process for prostate cancer demonstrating an ongoing need for educational intervention.

## Performance (RealIndex)

- Learners demonstrated good retention for items related to “considering ordering a biomarker” in the RI which is contradictory to their performance on the Competence that measured use of biomarkers. Despite slippage for Competence items, learners engaged in performance behavior that is consistent with clinical practice.
- Slippage was evident for screening items including whether to perform a biopsy or do nothing.

## Persistent Learning Gap

- Learners' retention at the 4 week follow-up was modest. Learners struggled with screening strategies for prostate cancer, including the previously identified learning gap, indicating additional education is necessary to ensure that clinical practices are reflective of current screening criteria.
- The predictive model that follows will identify drivers that can help prevent slippage, facilitate attainment and lead to higher Confidence. This includes the predicted magnitude of change expected if the learning gaps are successfully addressed.

## Prostate Cancer Screening in the Primary Care Setting: Understanding the Role of Bio-Markers

What specific *skills* or *practice behaviors* have you implemented for screening male patients with prostate cancer since this CME activity?

(Comments received from attendees at 4 week follow up) ( $N = 91$ )

- “I am more aware of using Biomarkers to screen for prostate cancer”
- “I have a better understanding of proper screening steps for patients at high risk for cancer”
- “I am more selective when choosing patients for urology referral”
- “I am more comfortable incorporating informed decision making”
- “I make it a point to spend time talking with the patient for shared decision making when discussing the PSA result”
- “I am following the current guidelines on when to refer patients for prostate biopsy”
- “I have reinforced my patient education and counseling”
- “I have increased my use of biomarkers”
- “I learned when to refer patient for biopsy”
- “I am using a lower PSA threshold to trigger further testing”
- “I am more aware of the Importance of gathering a targeted history and utilizing shared decision making”





## Prostate Cancer Screening in the Primary Care Setting: Understanding the Role of Bio-Markers

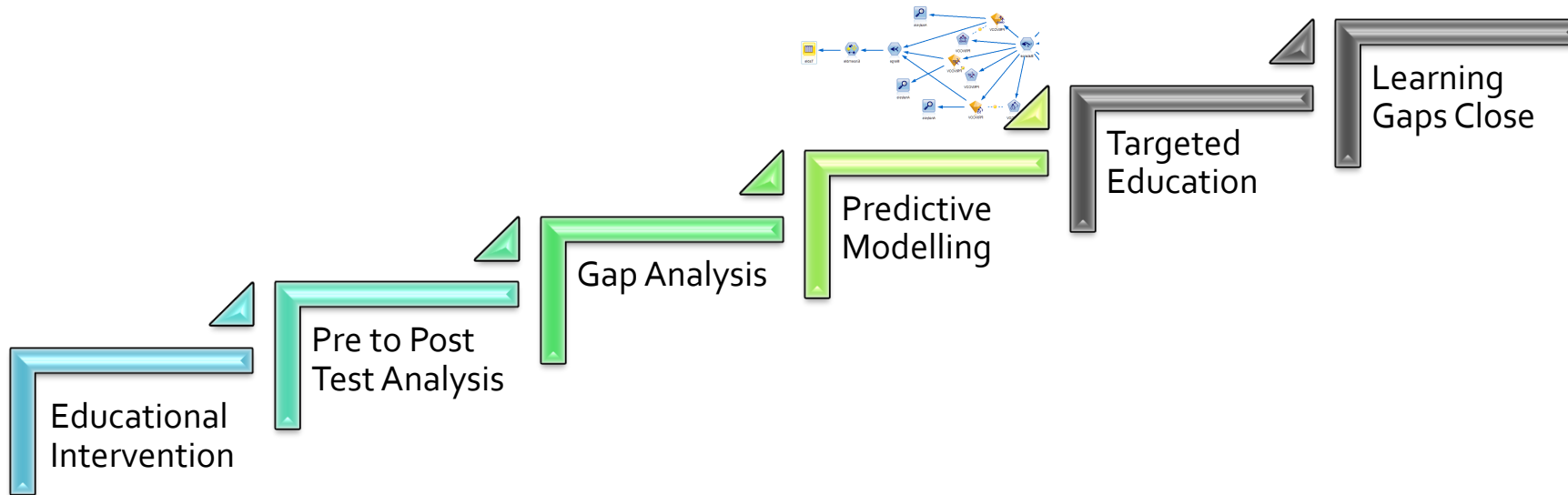
What *specific barriers* have you encountered that may have prevented you from successfully implementing strategies for screening male patients with prostate cancer since this CME activity?

(Comments received from attendees at 4 week follow up) ( $N = 91$ )

- Cost of testing
- Time
- Lab service availability
- Patient compliance
- Insurance coverage limitations
- Guidelines from different societies for PSA screening are confusing
- Refusal to obtain digital rectal exam by minority middle-age men
- Bad practice that has been passed on from other providers
- Not sure how to order biomarkers



# Predictive Modeling





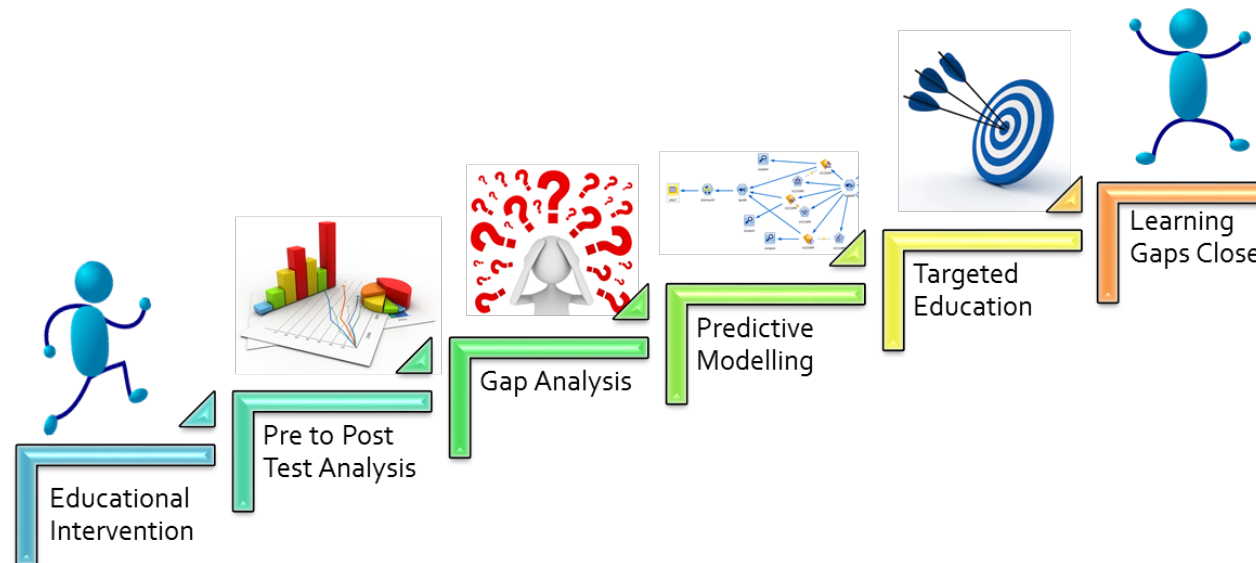


# What benefits does predictive modeling offer?

Gap analysis COMBINED with predictive modeling *enables* educators to go beyond identifying areas of additional educational need. Predictive modeling precisely guides educators in developing more robust educational programs that are targeted to learners' deficits based upon learners' prior performance rather than educated guesswork.

By examining learner strengths and weaknesses statistically, a profile of what contributes to high educational attainment, as well as areas where key deficits remain, can be derived. This profile will provide key indicators for what subject matter should be emphasized, as well as who might benefit most from these educational initiatives.

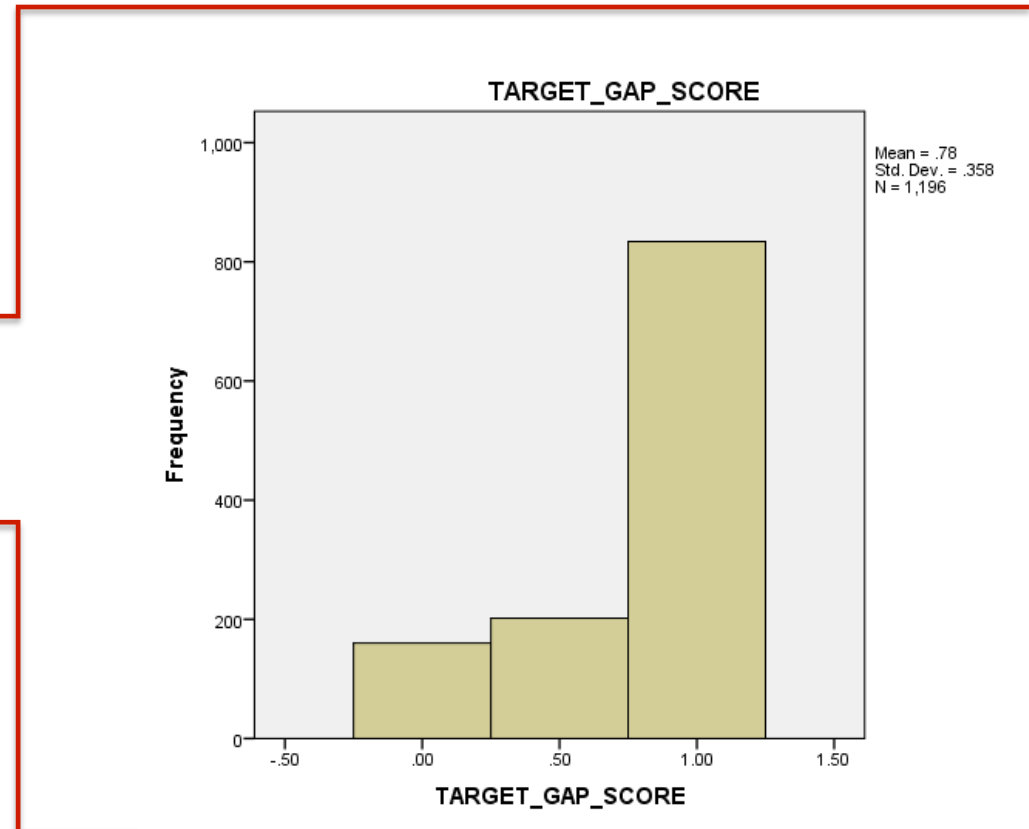
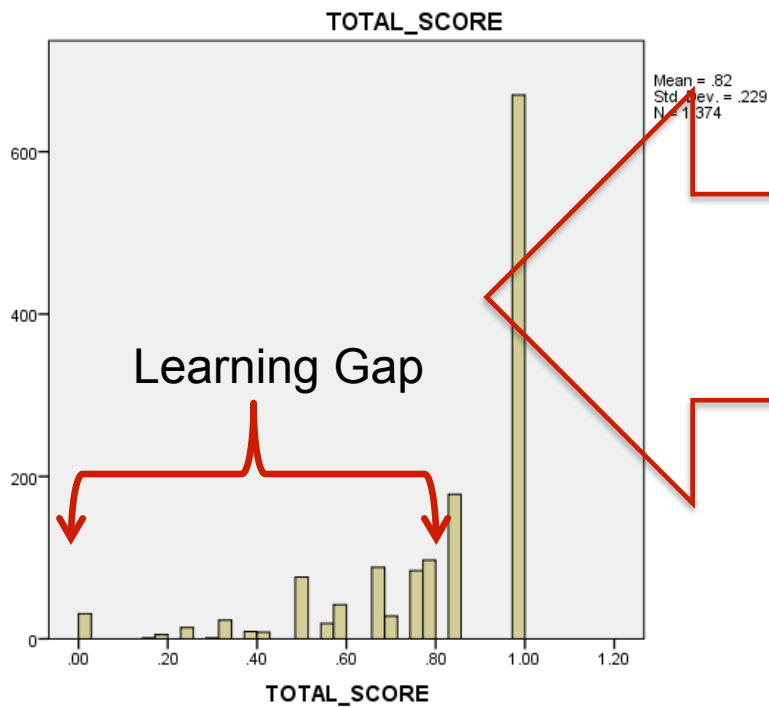
Not only that, the predictive model can be used to determine how effective future education will be; enabling educators to put their resources to best use.



# et Gap Score:

By identifying the lowest scoring items in the curriculum and averaging the overall score, we determine the target gap score. This score is used as the target in the predictive model to determine what is driving the gap.

The Composite Gap Score serves as the **Target**: screening protocol for prostate cancer.

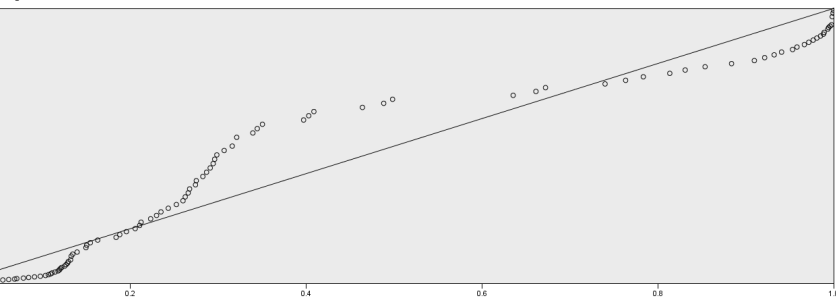


# The Model: Identifying Significant Drivers

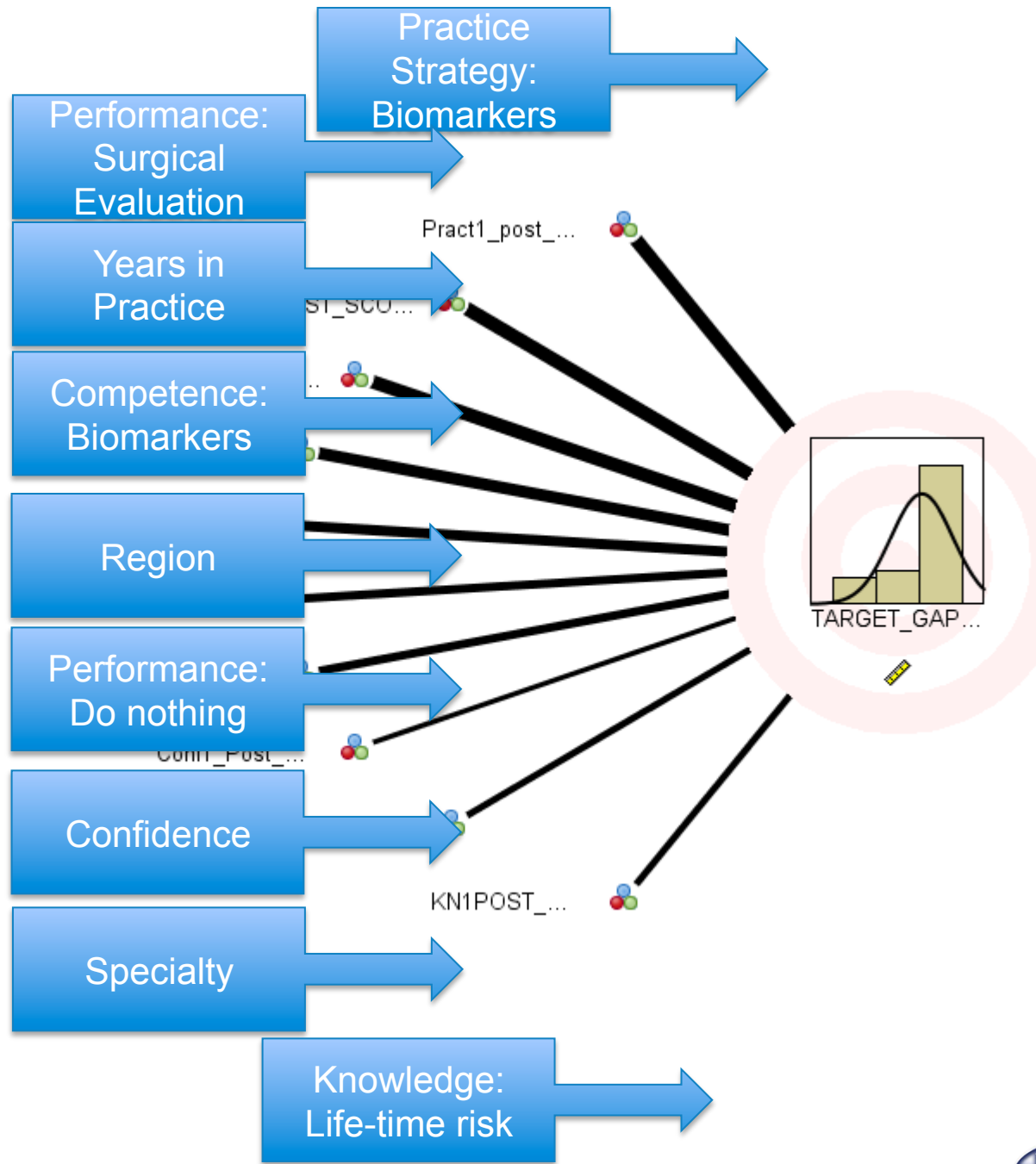
... questions across the learning domains (including knowledge, competence, confidence, and practice strategy), as well as learner demographics were analyzed to identify positive and/or negative predictors of learners' target (or p).

... statistically significant drivers were identified that include Knowledge, Performance, and demographics.

... is important to note that drivers can *facilitate* or *hinder* learners' performance. This means they can have either a positive or a negative influence on performance.



Standardized residuals compares the distribution of the residuals to a normal distribution. The diagonal line represents the normal distribution. The closer the observed cumulative probabilities of the residuals are to this line, the closer the distribution of the residuals is to the normal distribution.

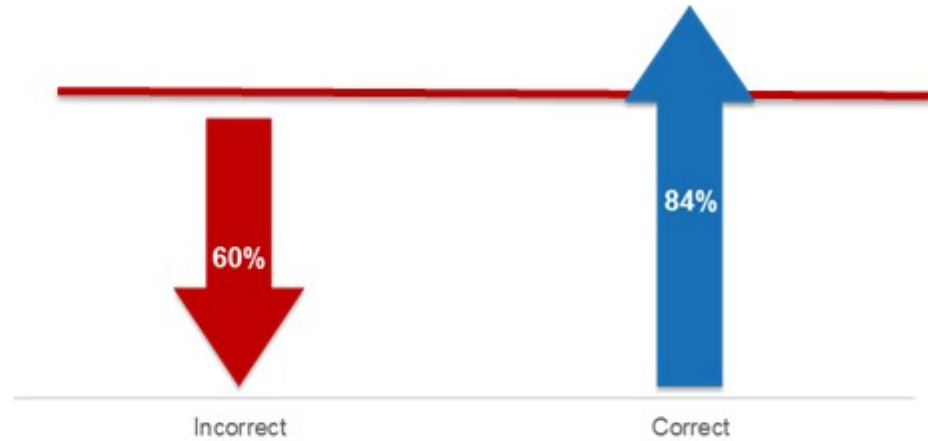


# Educational Drivers (5): The Prostate Cancer Model

 Performance: Surgical evaluation; do nothing



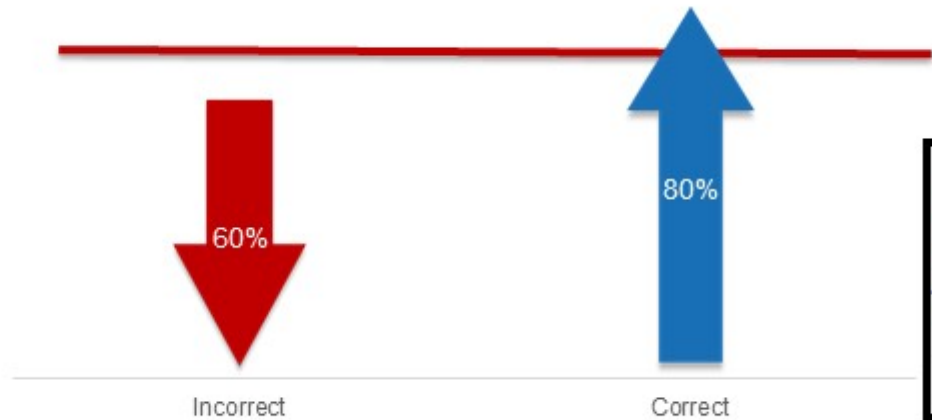
 Competence: Biomarkers






 Practice Strategy: Biomarkers



 Knowledge: Lifetime Risk



**Driver Impact**

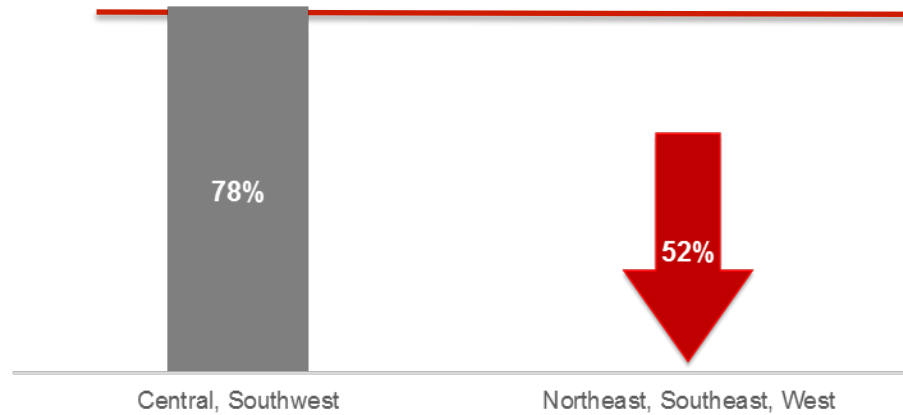
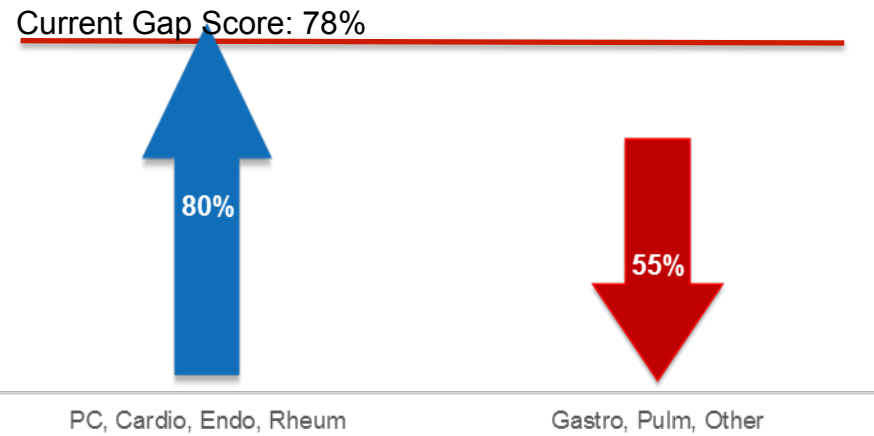
-  = % predicted Current Gap Score (TG) is addressed
-  = % predicted Target Gap Score is addressed
-  = No effect



# Demographic Drivers (4): Prostate Cancer Model

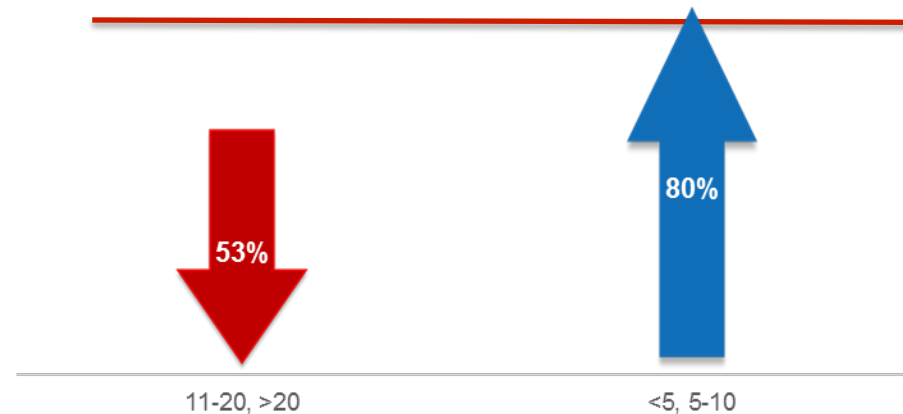
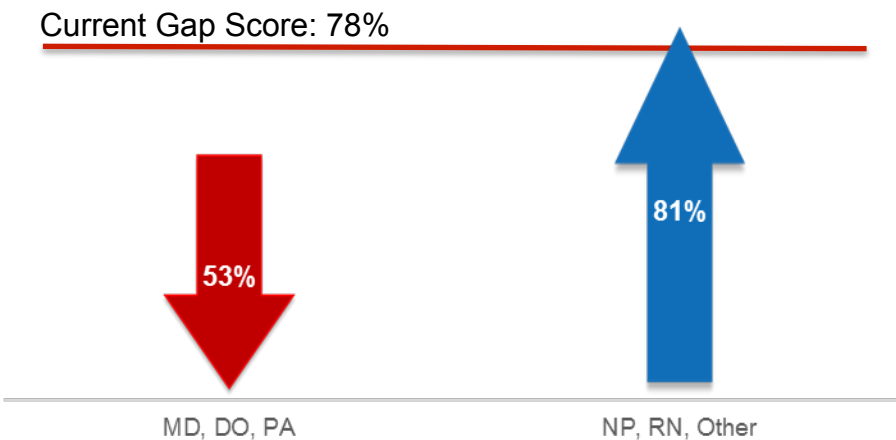
 Specialty

 Region






 Profession

 Years in Practice



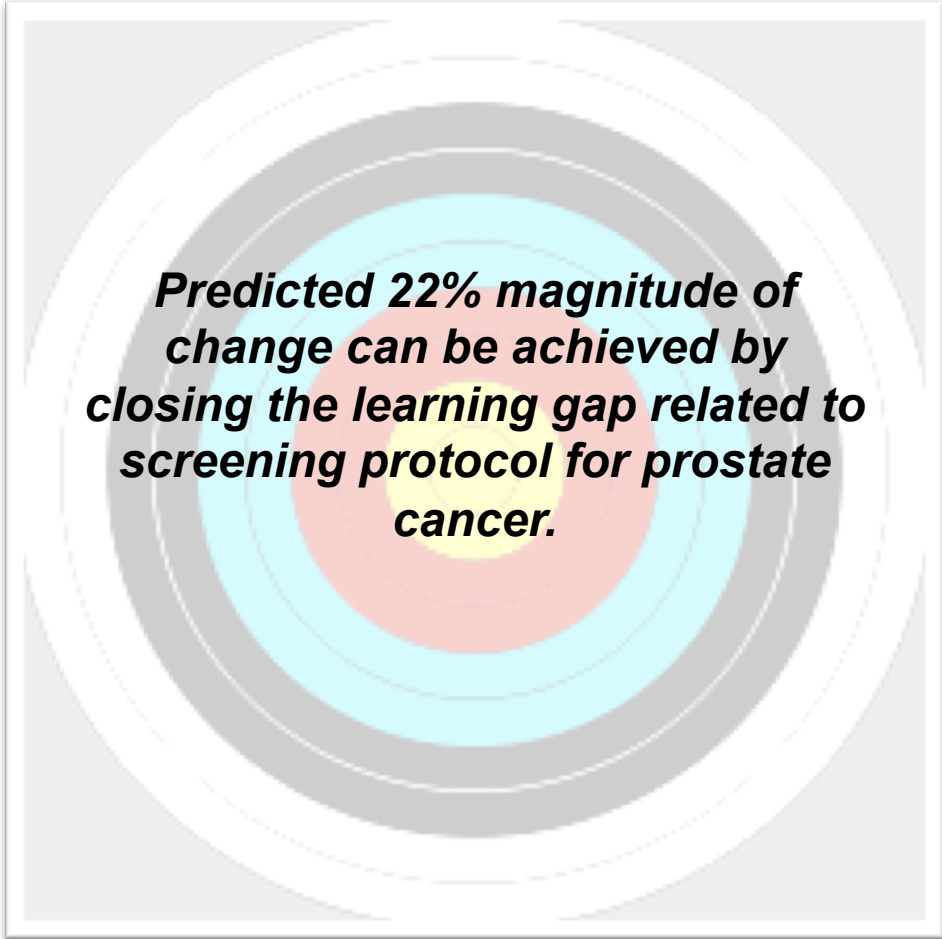
**Driver In**

-  = % predicted Gap Score (TGT) addressed
-  = % predicted Target Gap Score is addressed
-  = No effect

# Predicted Magnitude of Change

By addressing these drivers a **22% magnitude of change** can be achieved.

Targeted learning that focuses not only on the identified learning gap, but also incorporates the drivers, will facilitate higher educational attainment, retention and increased Confidence.



***Predicted 22% magnitude of change can be achieved by closing the learning gap related to screening protocol for prostate cancer.***

# Prostate Cancer Predictive Model: Summary of Findings

- Results from the final advanced analysis revealed an educational **gap concerning screening protocol for prostate cancer.**
- The final predictive modeling procedure identified 10 drivers that, if addressed in future education, will lead to an estimated **22% (magnitude of change) improvement in learners' overall proficiency in this area.**
  - Drivers (areas of focus to improve identified gap):
    1. **Knowledge** – Life-time risk of prostate cancer diagnosis & mortality
    2. **Performance Behavior** – appropriate screening protocols
      1. Surgical evaluation
      2. Whether to do nothing at this time
    3. **Practice Strategy** – Use of biomarkers
    4. **Competence** – Appropriate use of biomarkers
    5. **Profession** – MD, DO, & PA
    6. **Specialty** – Gastroenterology, Pulmonology, Other
    7. **Region** – Northeast, Southeast, West
    8. **Years in Practice** – 11-20, >20
    9. **Confidence** – low confidence adversely impacts performance

# Prostate Cancer Application of Findings – Applying the Outcomes

Addressing the identified learning gap & drivers

## Demographic Targeting

- Regional focus: Northeast, Southeast, West
- Years in practice: 11-20, >20
- Specialty: Gastroenterology, Pulmonology, Other
- Profession: MD, DO, & PA

## Content Focus

- Competency and performance behaviors related to screening protocol for prostate cancer including:
  - Biopsy
  - Use of biomarkers
  - Surgical evaluation
  - When to do nothing
  - Screening guidelines
  - SDM
- Knowledge regarding
  - Lifetime risk of diagnosis and mortality

## Instructional Design

- Incorporate case-based activities that emphasize screening protocol for patients suspected to have prostate cancer with an emphasis on the use of biomarkers; as well as education that focuses on guidelines for screening; including when to use more invasive procedures.
- Serial reinforcement to address retention concerning the screening of prostate cancer and confidence
- Include a team-based approach to screening of prostate cancer using case-based challenges to engage entire care team (profession & specialty)

