

Emerging Challenges in Primary Care: 2020

Recognizing and Managing Diabetic Kidney Disease: Evolving Strategies of Care



Final Outcomes Report

Bayer HealthCare Pharmaceuticals Grant ID: 24378

December 11, 2020

Emerging Challenges in Primary Care: 2020

This curriculum focused on identification and management of patients with Diabetic Kidney Disease (DKD)

Participation



10,404*
Total Attendees



6 Virtual
Sessions



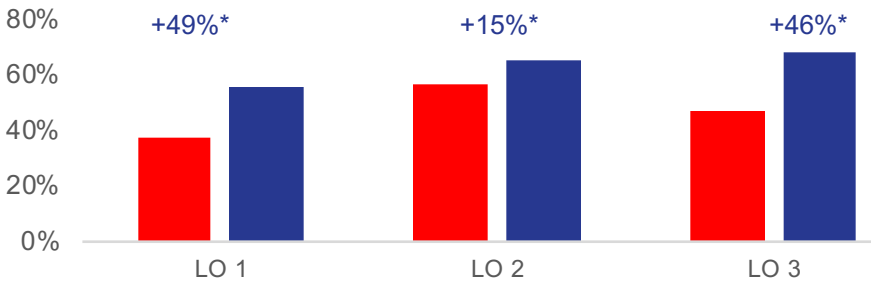
3,405 certificates
issued to date

This education has the potential to impact **6,400,125** Patients with diabetes on an annual basis.

112,675–133,483 Patients Weekly

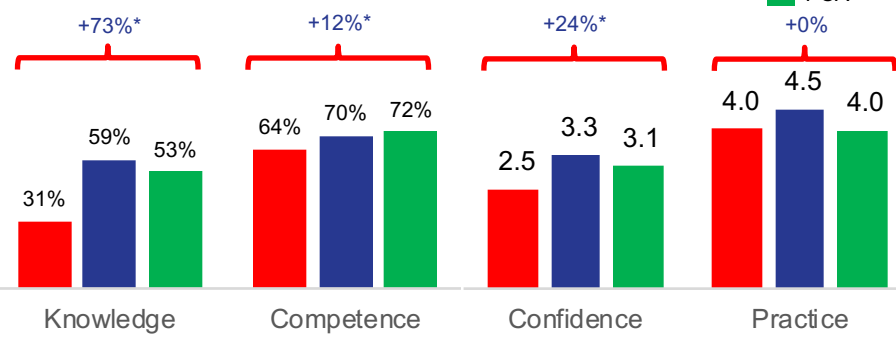
2020 Session	Date	Attendees
Emerging Challenges in Primary Care, Episode 1 <i>Miami: Florida, Georgia, Alabama, Mississippi, South Carolina</i>	4/25/20	1,834
Emerging Challenges in Primary Care, Episode 2 <i>Baltimore: Maryland, Pennsylvania, Virginia, West Virginia, Delaware, Ohio</i>	5/2/20	1,741
Emerging Challenges in Primary Care, Episode 3 <i>Tampa: Florida, Georgia, Alabama, Mississippi, South Carolina</i>	5/9/20	1,068
Emerging Challenges in Primary Care, Episode 4 <i>National: Birmingham with National Simulcast</i>	5/30/20	2,270
Emerging Challenges in Primary Care, Episode 5 <i>Raleigh: North Carolina, South Carolina, Tennessee, Kentucky, Virginia, West Virginia, Georgia</i>	6/6/20	1,256
Emerging Challenges in Primary Care, Episode 6 <i>National: Atlanta with National Simulcast</i>	6/13/20	2,235
Total		10,404

Learning Gains Across Objectives



- **LO 1, 49%* Improvement:** Recognize the burden of DKD as a unique disease entity that confers a high risk of cardiovascular disease, renal events, and associated mortality
- **LO 2, 15%* Improvement:** Utilize recommended screening strategies to ensure early diagnosis of chronic kidney disease in patients with diabetes, including the use of UACR and eGFR
- **LO 3, 46%* Improvement:** Describe how emerging treatment approaches may impact the complex pathophysiology of DKD

Learning Domain Analysis



- In each of the four curriculum learning domains, substantial and significant gains were achieved from Pre- to Post-Test
- The strongest improvements, from lowest Pre-Test scores, were measured in Knowledge; this increase was driven by an item addressing differences between steroidal and non-steroidal MRAs
- In practice strategy, increases to very high Post-Test ratings were measured on intent to screen patients with T2D for DKD
- In Confidence, low Post-Test ratings reflect possible learner awareness of outstanding gaps in Knowledge and Competence

Persistent Learning Gaps/Needs

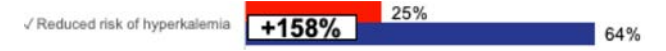
Mechanism of action of cardiovascular impact of DKD

Learners remained challenged in recognizing the mechanism by which DKD increases the risk for cardiovascular disease.



Differential risk of hyperkalemia associated with steroidal and non-steroidal mineralocorticoid receptor antagonists

Learners remained challenged in recognizing the reduced risk of hyperkalemia associated with non-steroidal MRAs



Use of eGFR and UACR testing to diagnose DKD

On a Competence item presenting the case of a patient with a history of diabetes and several blood levels evaluated, learners remained challenged at Post-Test despite improvements when choosing a diagnosis of DKD with the appropriate reason.



The baseline knowledge and competency gaps in the care of patients with Diabetic Kidney Disease uncovered in this program and these persistent learning gaps, signify a clear gap in knowledge and an unmet need among clinicians. It continues to be an important area for future educational programs.

Curriculum Patient Impact

In the Post-Test, learners (N = 4,518) were asked to report how many patients with diabetes they see per week in any clinical setting by selecting a range. The resulting distribution of learner responses was then extrapolated to reflect the total number of learners who have attended the sessions.

The findings reveal that this education has the potential to impact

6,400,125
patients on an annual basis.

112,675–133,483 patients on a weekly basis

112,675–
133,483

Course Director

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UC Riverside School of Medicine
Director, Unger Concierge Primary Care
Rancho Cucamonga, CA

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Commercial Support

The Emerging Challenges in Primary Care: 2020 series of CME activities were supported through educational grants or donations from the following companies:

- Amgen
- Astellas Pharma Global Development, Inc.
- AstraZeneca Pharmaceuticals LP
- Bayer Healthcare Pharmaceuticals Inc.
- Esperion Therapeutics, Inc.
- Ferring Pharmaceuticals, Inc.
- Gilead Sciences, Inc.
- Kaneka Pharma America LLC
- Lilly
- Novo Nordisk, Inc.
- Takeda Pharmaceuticals U.S.A., Inc.

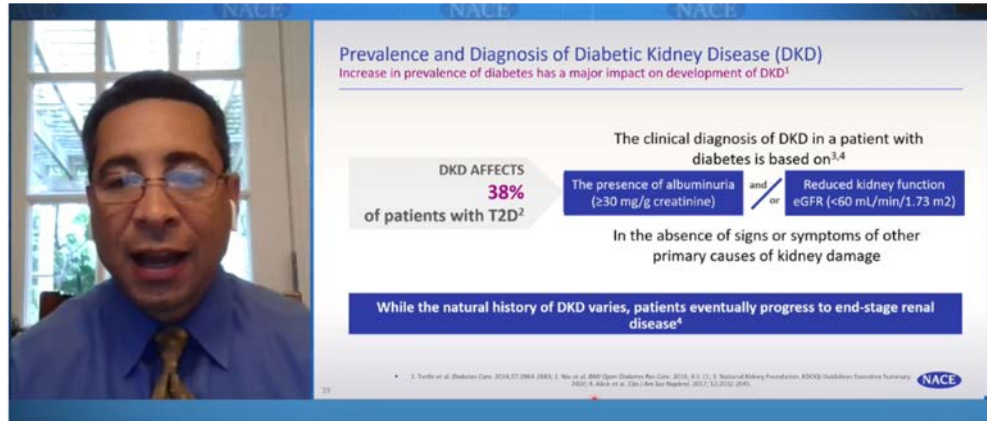
Overview

Learning Objectives

- Recognize the burden of DKD as a unique disease entity that confers a high risk of cardiovascular disease, renal events, and associated mortality
- Utilize recommended screening strategies to ensure early diagnosis of chronic kidney disease in patients with diabetes, including the use of UACR and eGFR
- Describe how emerging treatment approaches may impact the complex pathophysiology of DKD

Curriculum Overview

6 Accredited Live Regional Symposia : April - June 2020



Prevalence and Diagnosis of Diabetic Kidney Disease (DKD)
Increase in prevalence of diabetes has a major impact on development of DKD¹

DKD AFFECTS **38%** of patients with T2D²

The clinical diagnosis of DKD in a patient with diabetes is based on^{3,4}

The presence of albuminuria (≥30 mg/g creatinine) and/or Reduced kidney function (eGFR <60 mL/min/1.73 m²)

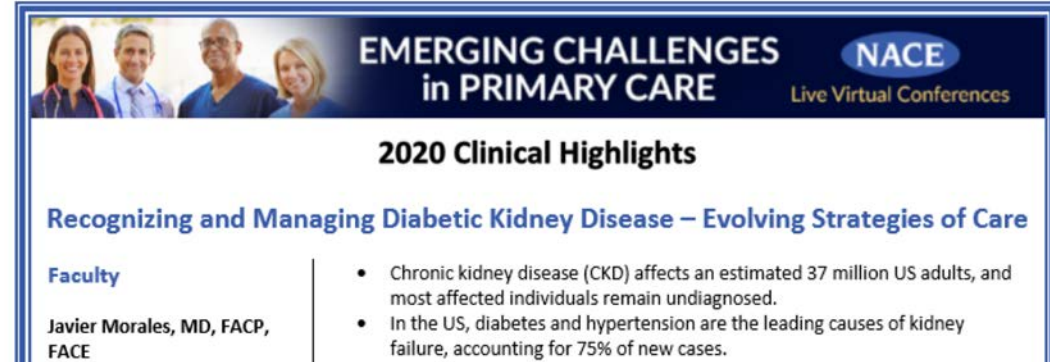
In the absence of signs or symptoms of other primary causes of kidney damage

While the natural history of DKD varies, patients eventually progress to end-stage renal disease⁴

1. Tuder et al. Diabetes Care. 2014;37:2064-2069. 2. Wu et al. BMJ Open Diabetes Res Care. 2019; 6(1):1. 3. National Kidney Foundation. KDOQI Guidelines for the Management of Diabetes Mellitus. 2009. 4. Alkhalaf et al. Clin J Am Soc Nephrol. 2011; 5(10):1010-1014.

Clinical Highlights eMonograph

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



EMERGING CHALLENGES in PRIMARY CARE NACE Live Virtual Conferences

2020 Clinical Highlights

Recognizing and Managing Diabetic Kidney Disease – Evolving Strategies of Care

Faculty

Javier Morales, MD, FACP, FACE

- Chronic kidney disease (CKD) affects an estimated 37 million US adults, and most affected individuals remain undiagnosed.
- In the US, diabetes and hypertension are the leading causes of kidney failure, accounting for 75% of new cases.

Enduring CME Symposium Webcast

Available at: <https://www.naceonline.com/courses/recognizing-and-managing-diabetic-kidney-disease-evolving-strategies-of-care>

Recognizing and Managing Diabetic Kidney Disease – Evolving Strategies of Care



COURSE SUMMARY

Cost: Free

Start Date: 06/30/2020

Expiration Date: 06/29/2021

Target Audience: Primary Care Providers

Format: Webcast

Estimated Time To Complete CME Activity: 1.0 hour

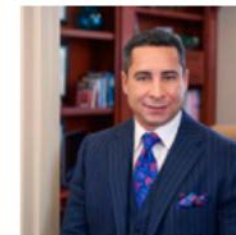
Credit(s):

1.0 AMA PRA Category 1 Credit™

1.0 AANP Contact Hour which includes 0.75 pharmacology hours

Hardware/Software Requirements: Any web browser

Speaker



Javier Morales, MD, FACP, FACE
Clinical Associate Professor of Medicine
Donald and Barbara Zucker School of Medicine at
Hofstra/Northwell University
Vice President
Advanced Internal Medicine Group, P.C.
East Hills, NY



Outcomes Methodology

Learning outcomes were measured using matched Pre-Test and Post-Test scores for Knowledge, Performance, Confidence, and practice strategy and across all of the curriculum's Learning Objectives.

Outcomes Metric	Definition	Application
Percentage change	This is how the score changes resulting from the education are measured. The change is analyzed as a relative percentage difference by taking into account the magnitude of the Pre-Test average.	Differences between Pre-Test, Post-Test, and PCA score averages
P value (p)	This is the measure of the statistical significance of a difference in scores. It is calculated using dependent or independent samples t-tests to assess the difference between scores, taking into account sample size and score dispersion. Differences are considered significant for when $p \leq .05$.	Significance of differences between Pre-Test, Post-Test, and PCA scores and among cohorts
Effect size (d)	This is a measure of the strength/magnitude of the change in scores (irrespective of sample size). It is calculated using Cohen's d formula, with the most common ranges of d from 0-1: $d < .2$ is a small effect, $d = .2-.8$ is a medium effect, and $d > .8$ is a large effect.	Differences between Pre-Test and Post-Test score averages
Power	This is the probability (from 0 to 1) that the "null hypothesis" (no change) will be appropriately rejected. It is the probability of detecting a difference (not seeing a false negative) when there is an effect that is dependent on the significance (p), effect size (d), and sample size (N).	Differences between Pre-Test and Post-Test score averages
Percentage non-overlap	This is the percentage of data points at the end of an intervention that surpass the highest scores prior to the intervention. In this report, it will reflect the percentage of learners at Post-Test who exceed the highest Pre-Test scores.	Differences between Pre-Test and Post-Test score averages

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Participation



10,404*
Total Attendees



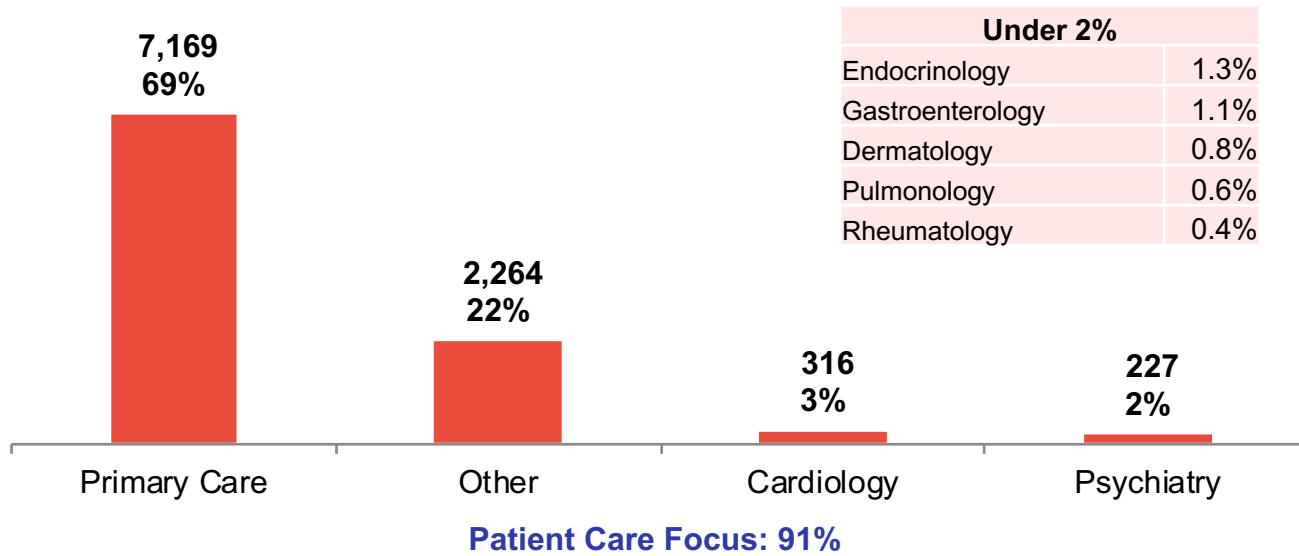
6 Virtual Sessions

3,166 Follow-up Participants
30% Rate of follow-up engagement

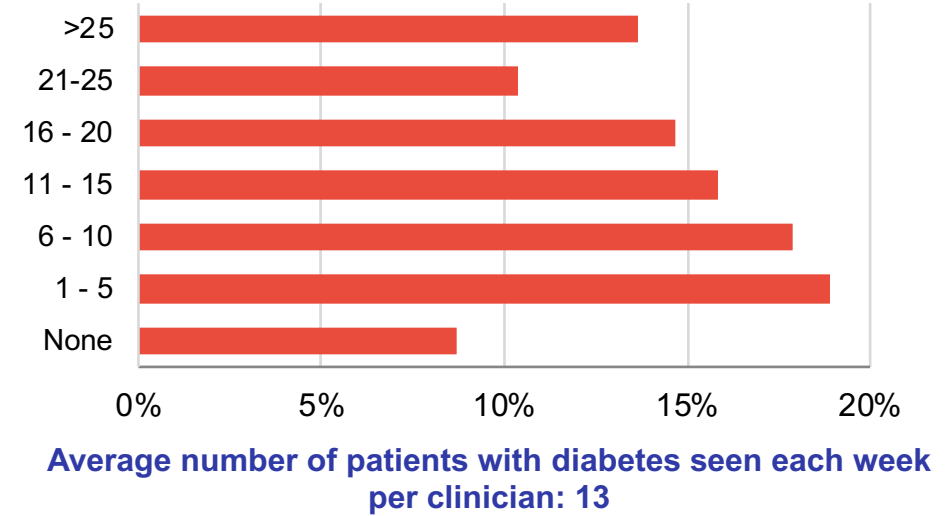
*These numbers represent the total number of attendees, irrespective of assessment participation

Level 1: Demographics and Patient Reach

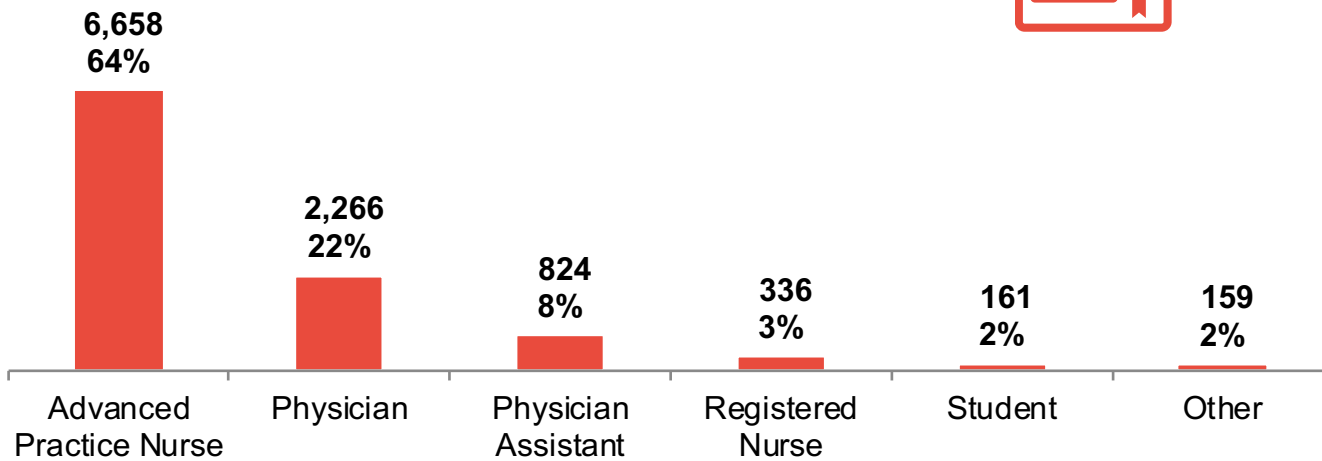
Specialty



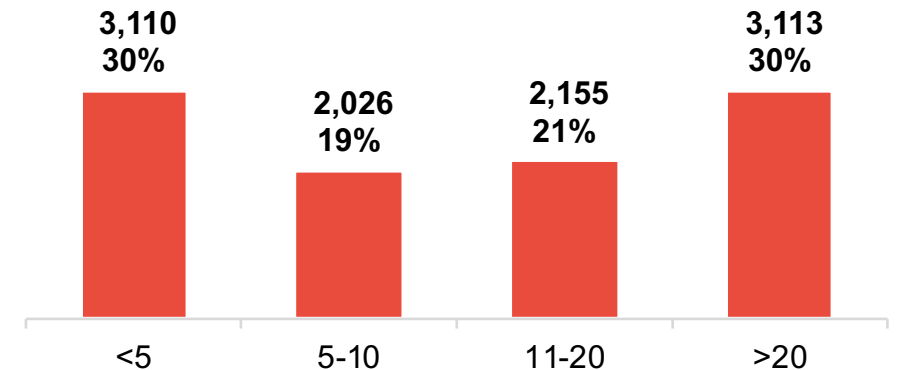
Patients with diabetes seen each week, in any clinical setting:



Profession



Years in Practice

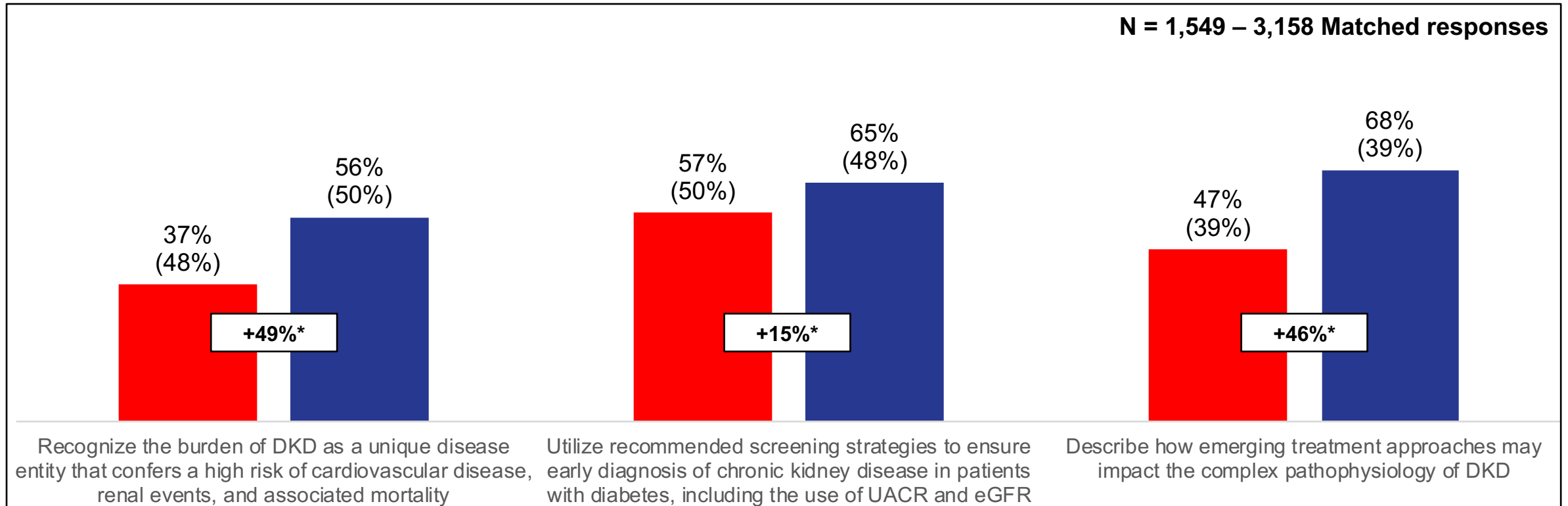




**Level 2-5:
Outcomes Metrics**

Learning Objective Analysis

Pre-Test
Post-Test



- Across all three curriculum Learning Objectives, substantial and significant improvements were measured from low scores at Pre-Test (< 58%)
- The strongest gains were measured on recognizing the burden of DKD as a unique disease entity that confers a high risk of cardiovascular disease, renal events, and associated mortality
- Despite these gains, low Post-Test scores (< 70%) across all Objectives represent outstanding educational needs in this area

Learning Objective Analysis

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

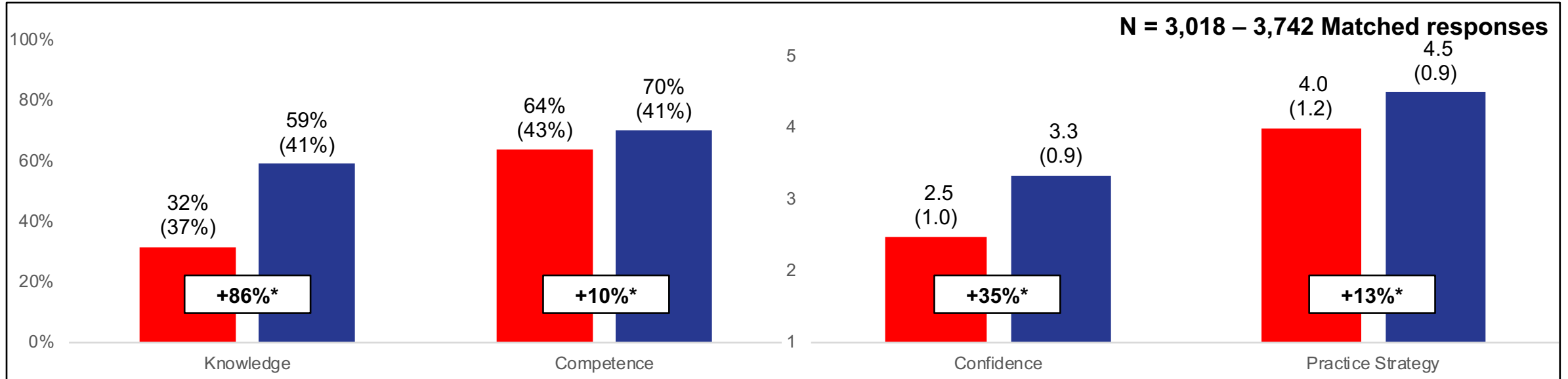
Cohort comparison by profession

Learning Objective	Advanced Practice Nurses				Physicians			
	N	Pre-Test	Post-Test	Change	N	Pre-Test	Post-Test	Change
Recognize the burden of DKD as a unique disease entity that confers a high risk of cardiovascular disease, renal events, and associated mortality	1,284	31% (46%)	50% (50%)	+62%*	483	55% (50%)	72% (45%)	+31%*
Utilize recommended screening strategies to ensure early diagnosis of chronic kidney disease in patients with diabetes, including the use of UACR and eGFR	620	51% (50%)	64% (48%)	+24%*	289	59% (49%)	61% (49%)	+2%
Describe how emerging treatment approaches may impact the complex pathophysiology of DKD	1,380	46% (37%)	67% (40%)	+46%*	504	50% (40%)	78% (36%)	+54%*

- For both advanced practice nurses and physicians, significant gains were measured from Pre- to Post-Test in recognizing the burden of DKD as a unique disease entity and in describing how emerging treatment approaches may impact the pathophysiology of DKD
 - While advanced practice nurses also achieved significant improvements in utilization of recommended screening strategies to ensure early diagnosis of chronic kidney disease, physicians struggled to make improvement in this area, with no significant change in score

Learning Domain Analysis

Pre-Test
Post-Test



- In each of the four curriculum learning domains, substantial and significant gains were achieved from Pre- to Post-Test
- The strongest improvements, from lowest Pre-Test scores, were measured in Knowledge; this increase was driven by an item addressing differences between steroidal and non-steroidal MRAs
- In practice strategy, increases to very high Post-Test ratings (4.5) were measured on intent to screen patients with T2D for DKD
- In Confidence, low Post-Test ratings (3.3) reflect possible learner awareness of outstanding gaps in Knowledge and Competence

Learning Domain Analysis

Cohort comparison by profession

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

Learning Domain	Advanced practice nurses				Physicians			
	N	Pre-Test	Post-Test	% Change	N	Pre-Test	Post-Test	% Change
Knowledge	1,365	26% (34%)	55% (41%)	+108%*	516	44% (38%)	72% (37%)	+66%*
Competence	1,313	64% (43%)	70% (41%)	+9%*	487	66% (42%)	73% (38%)	+10%*
Confidence	1,620	2.3 (1.0)	3.2 (0.9)	+38%*	604	2.8 (1.0)	3.5 (0.9)	+28%*
Practice	1,359	4.0 (1.2)	4.5 (0.9)	+14%*	498	4.2 (1.1)	4.6 (0.8)	+9%*

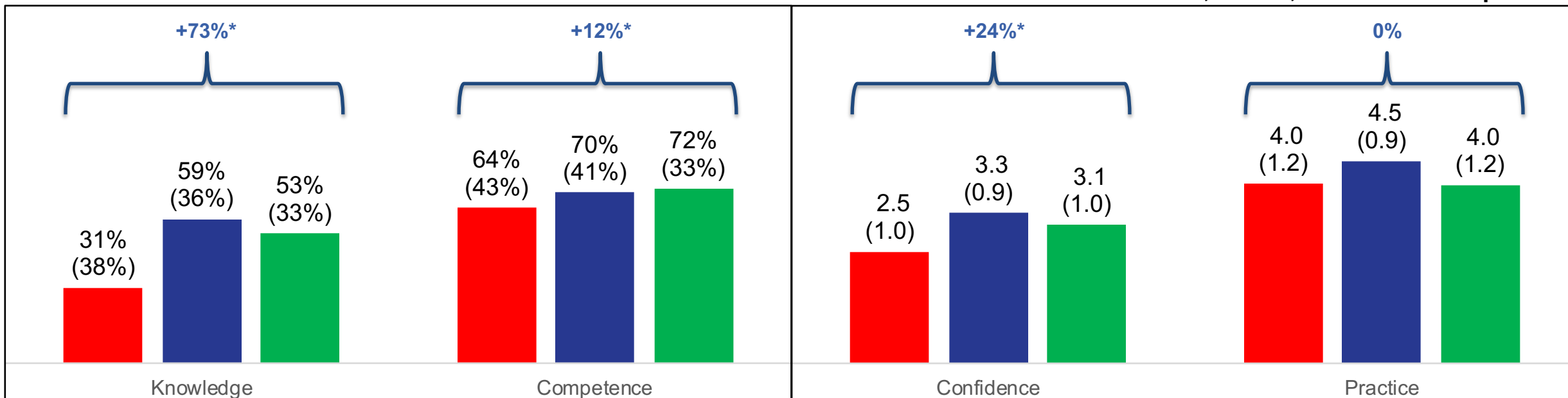
- When comparing the scores of advanced practice nurses and physicians by learning domain, both groups achieved statistically significant gains from Pre- to Post-Test, across all four domains
- In Knowledge, Confidence, and practice strategy, advanced practice nurses achieved greater improvements from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

4-Week Retention Analysis

By Learning Domain

Pre-Test Post-Test PCA

N = 1,323 – 1,593 Matched responses



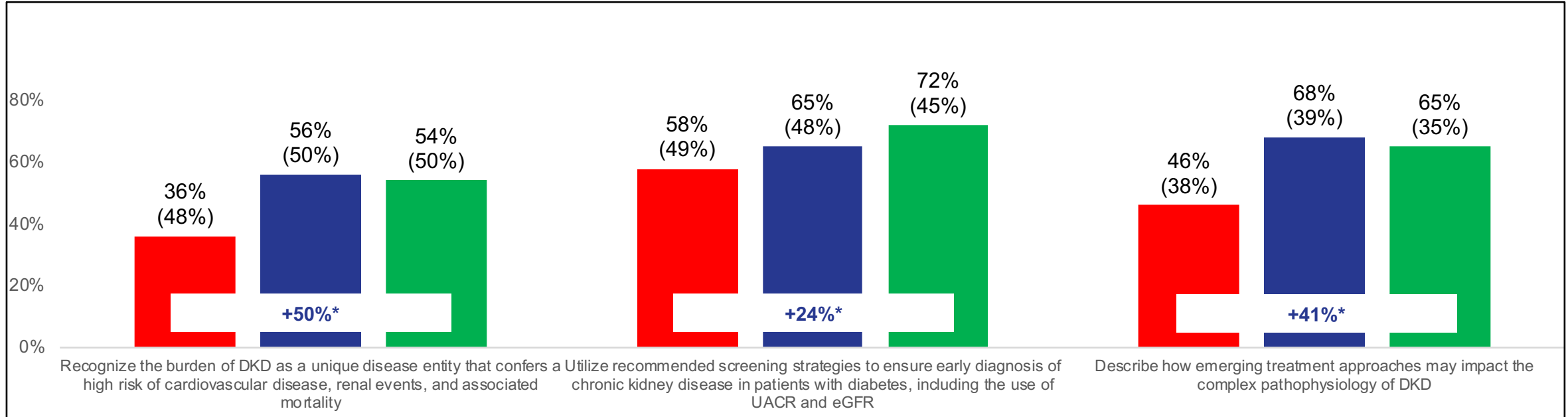
- Four to six weeks following their engagement in one of the curriculum sessions, learners were prompted to complete a brief Post Curriculum Assessment (PCA), which repeated items from each of the four curriculum learning domains
- In each of the four domains except practice strategy, substantial and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

4-Week Retention Analysis

By Learning Objective

Pre-Test Post-Test PCA

N = 679 – 1,397 Matched responses

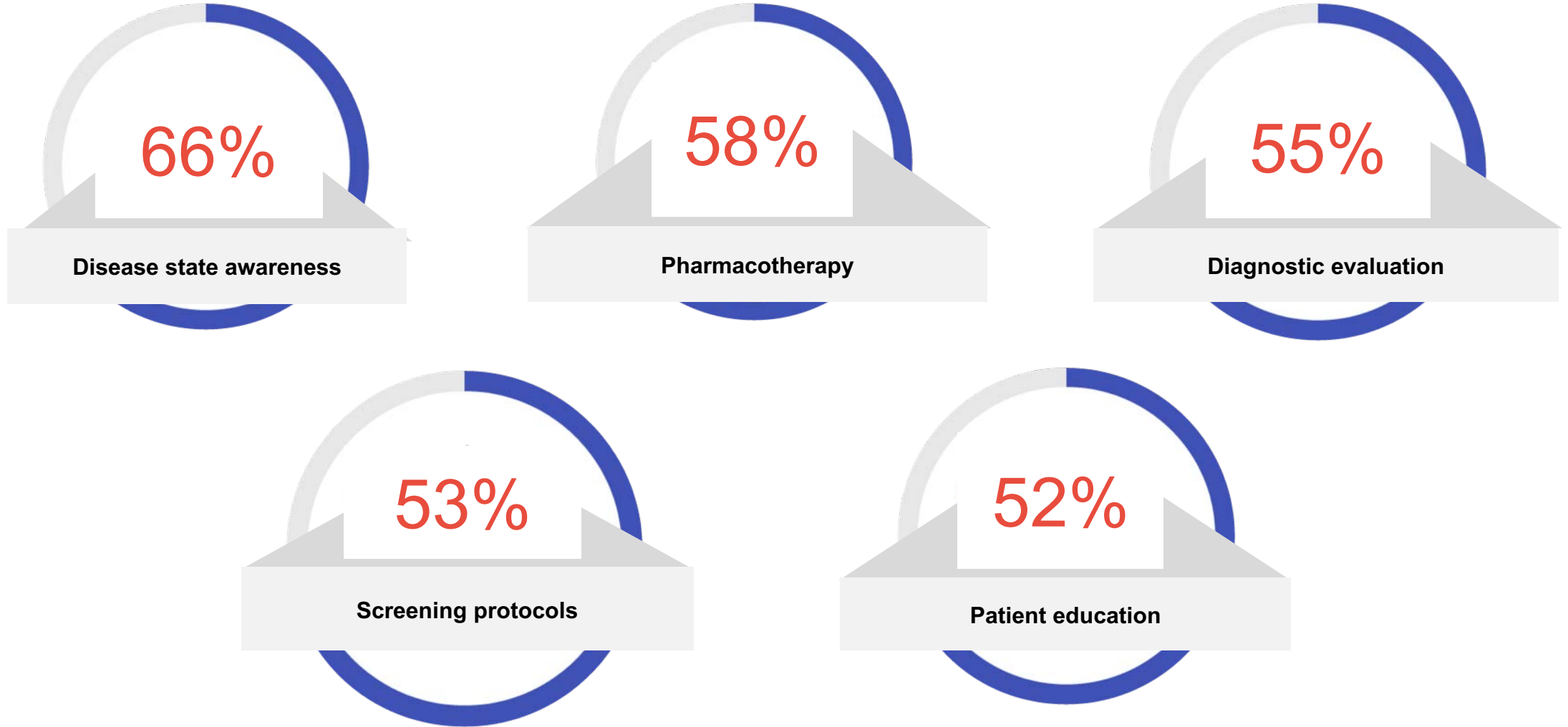


- When examining results by Learning Objective, substantial and significant net gains were achieved from Pre-Test to PCA measurements on each of the three Objectives
- The strongest gains, from the lowest Pre-Test scores, were measured in recognition of the burden of DKD as a unique disease entity that confers a high risk of cardiovascular disease, renal events, and associated mortality
- Ongoing improvements from Post-Test to PCA measurements were achieved in utilization of recommended screening strategies to ensure early diagnosis of chronic kidney disease in patients with diabetes

(4-week Post Assessment)

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

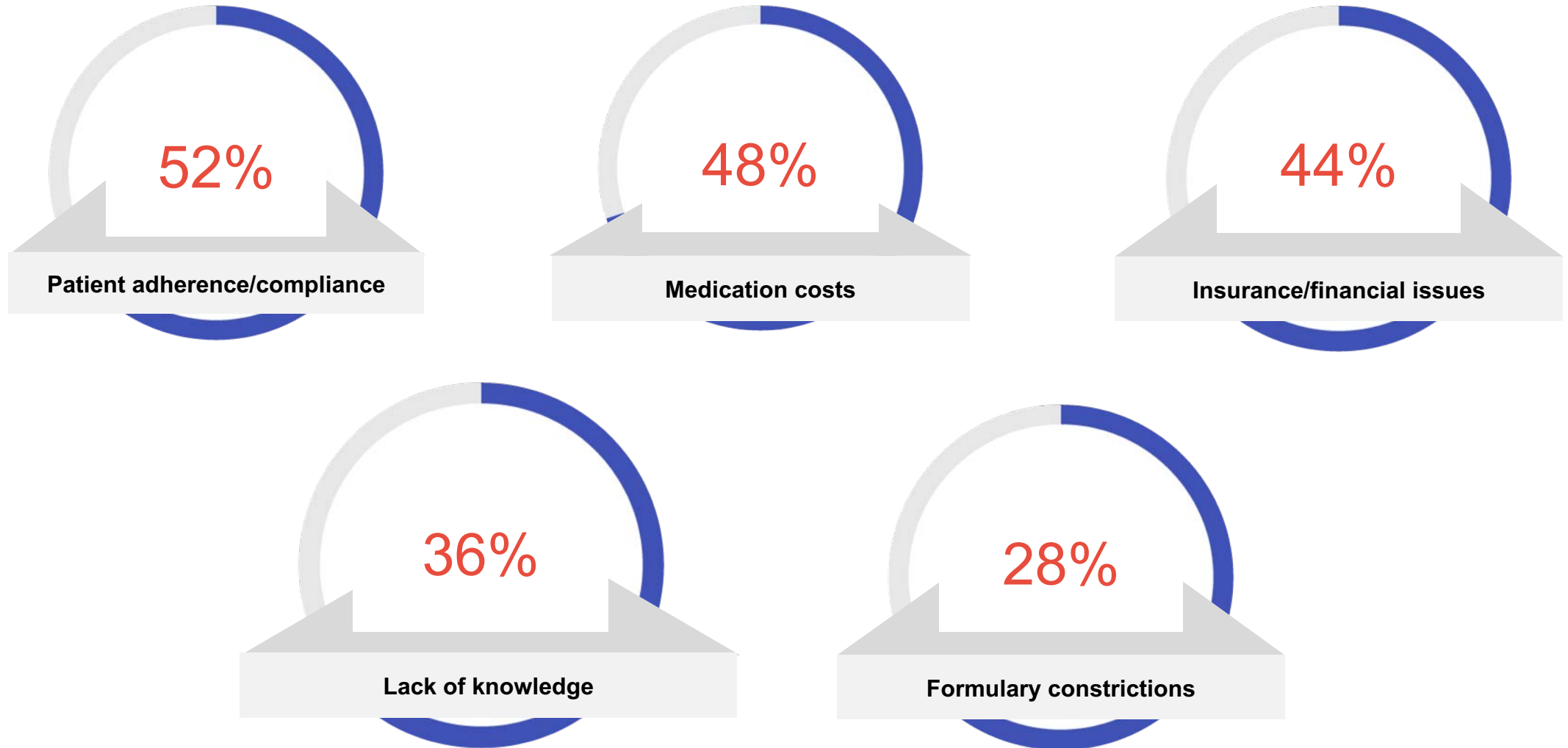
N = 2,862



(4-week Post Assessment)

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

N = 2,862



Identified Learning Gap:

Mechanism of action of cardiovascular impact of DKD

Despite improvements in score on a Knowledge item addressing the mechanism by which DKD increases the risk for cardiovascular disease, low Post-Test scores were measured

Which of the following is a mechanism by which diabetic kidney disease increases risk for cardiovascular disease?

Results:

- At Post-Test, 56% of learners correctly answered: “Increased endothelial dysfunction”

Identified Learning Gap:

Differential risk of hyperkalemia associated with steroidal and non-steroidal mineralocorticoid receptor antagonists

Despite improvements in score on a Knowledge items addressing the impact on hyperkalemia risk of steroidal and non-steroidal MRAs, low Post-Test scores were measured

Compared to steroidal mineralocorticoid receptor antagonists (MRAs), non-steroidal MRAs appear to be associated with which of the following?

Results:

- At Post-Test, 64% of learners correctly answered: “Reduced risk of hyperkalemia”

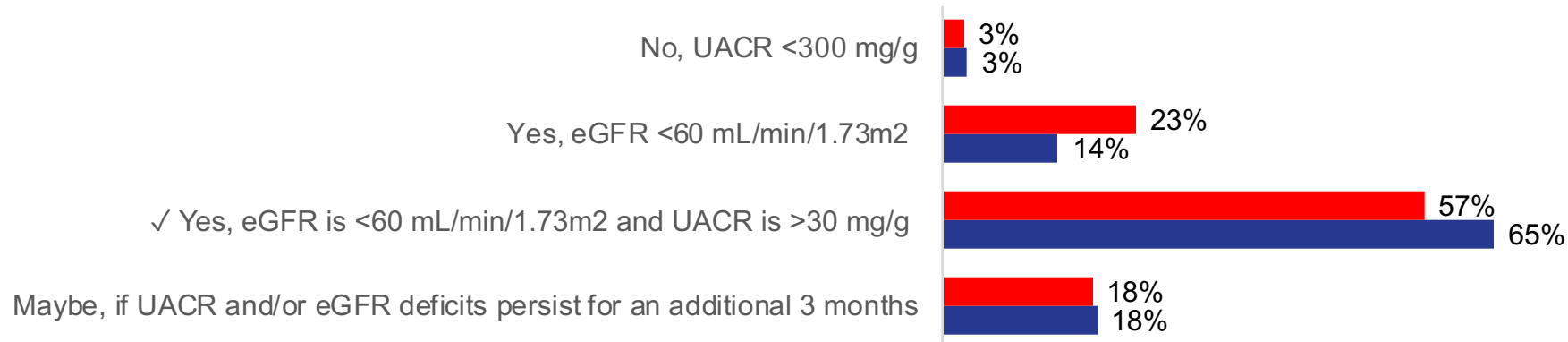
Identified Learning Gap: *Use of eGFR and UACR testing to diagnose DKD*

On a Competence item presenting the case of a patient with a history of diabetes and several blood levels evaluated, learners remained challenged at Post-Test despite improvements when choosing a diagnosis of DKD with the appropriate reason

63 y/o man with 16-year history of T2D presents for checkup. Med Hx: Hypertension, dyslipidemia, stent placed 1 year ago for unstable angina. Exam: BP 142/84 mmHg, BMI 31 kg/m². Labs: A1c 7.6%, serum creatinine 1.4 mg/dL, eGFR 51 mL/min/1.73m², urine albumin:creatinine ratio (UACR) 286 mg/g, stable for 6 months. Based on this presentation, does this patient have diabetic kidney disease?

Results:

- At Post-Test, 65% of learners correctly answered: “Yes, eGFR is <60 mL/min/1.73m² and UACR is >30 mg/g”



Overall Educational Impact

- Substantial, significant improvements were seen across all four curriculum learning domains, from Pre- to Post-Test (Knowledge, Competence, Confidence, and practice strategy)
 - These gains were generally stronger for advanced practice nurses compared to physicians, though physicians achieved higher Post-Test scores across all domains
 - These gains were seen across all individual Knowledge and Competence items, with improvements ranging from 8% to 158%
- Significant improvements ranging from 15% to 49% were measured across all Learning Objectives, with all Post-Test scores between 56% and 68%
- On a follow-up assessment given four to six weeks following the activity, ongoing improvements from Post-Test were seen on both Competence items, addressing diagnosis of DKD and selection of diabetes treatment with risk of DKD progression in mind
 - Slippage from Post-Test to follow-up on both Knowledge items, together with low Confidence, motivates further reinforcement in this area
- The analysis of the Knowledge and Competence domains identified three **opportunities for further education in the detection and management of patients with DKD**
 - Mechanism of action of cardiovascular impact of DKD
 - Differential risk of hyperkalemia associated with steroidal and non-steroidal mineralocorticoid receptor antagonists
 - Use of eGFR and UACR testing to diagnose DKD

Appendix

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

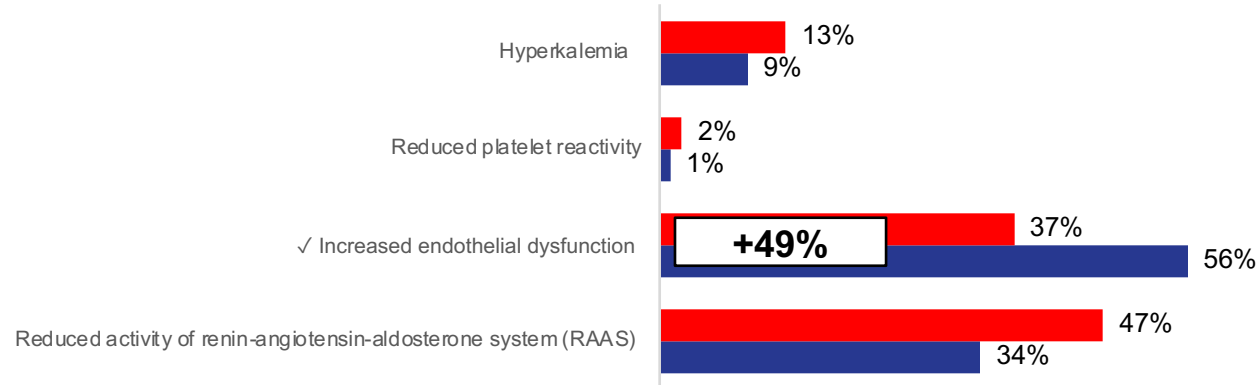
**Slides 29 – 31: Pre-Test, Post-Test, and
PCA matched item responses***

Knowledge Items

Pre-Test
Post-Test

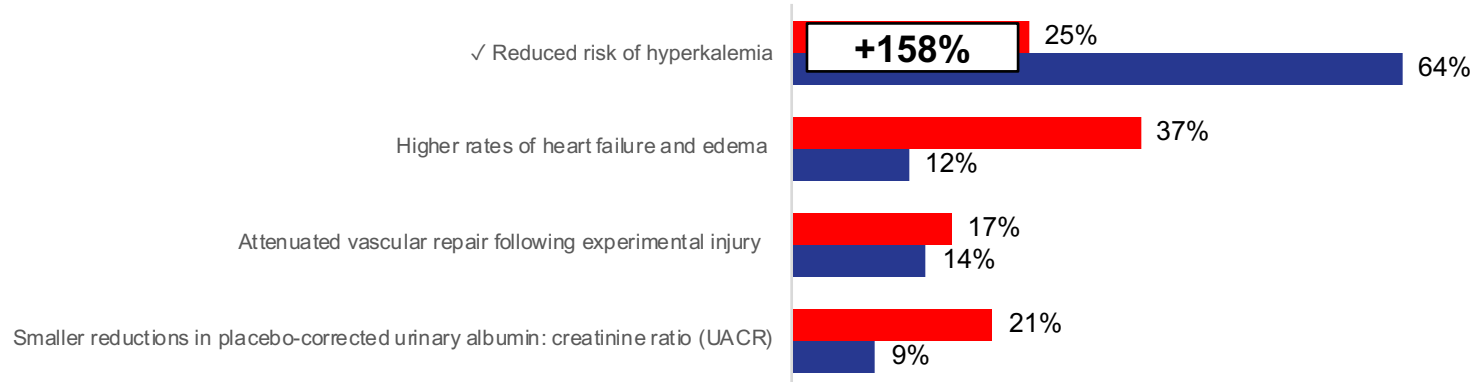
Which of the following is a mechanism by which diabetic kidney disease increases risk for cardiovascular disease?

N = 2,933 Matched responses



Compared to steroidal mineralocorticoid receptor antagonists (MRAs), non-steroidal MRAs appear to be associated with which of the following?

N = 2,624 Matched responses

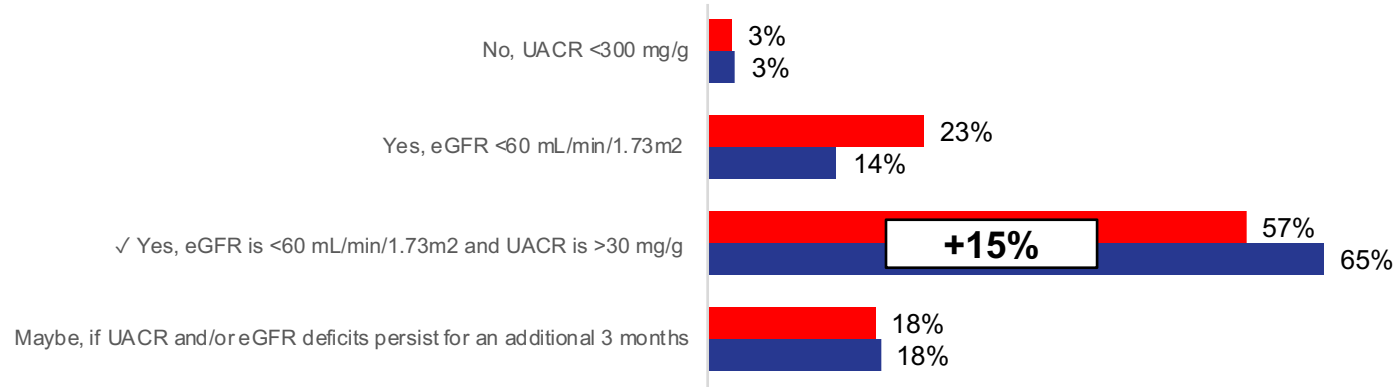


Competence Items

Pre-Test
Post-Test

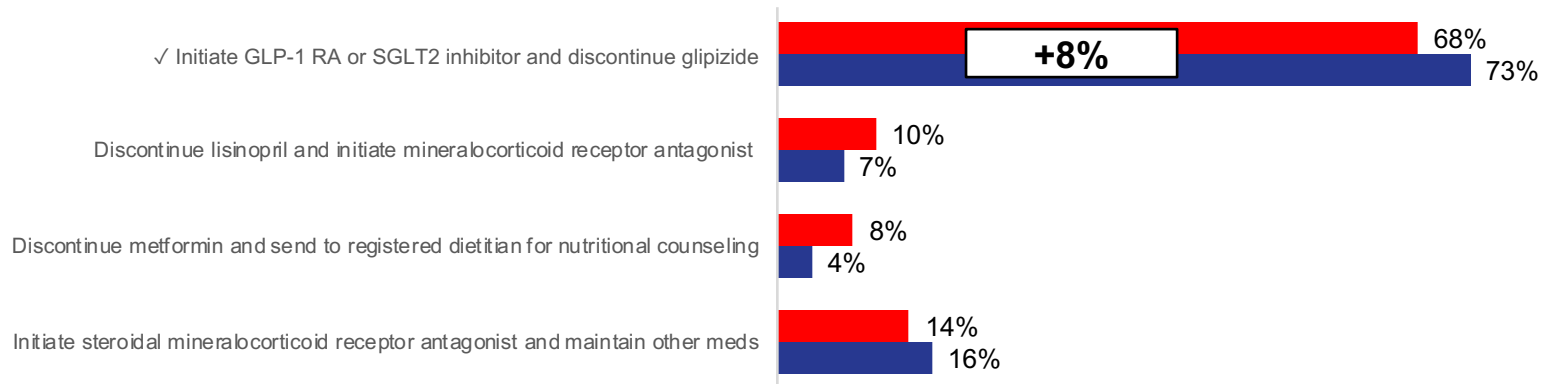
63 y/o man with 16-year history of T2D presents for checkup. Med Hx: Hypertension, dyslipidemia, stent placed 1 year ago for unstable angina. Exam: BP 142/84 mmHg, BMI 31 kg/m². Labs: A1c 7.6%, serum creatinine 1.4 mg/dL, eGFR 51 mL/min/1.73m², urine albumin:creatinine ratio (UACR) 286 mg/g, stable for 6 months. Based on this presentation, does this patient have diabetic kidney disease?

N = 1,549 Matched responses



65 y/o woman with 10-year history of T2D. Med Hx: Hypertension, dyslipidemia, DKD, NSTEMI 6 months ago. Exam: BP 132/72 mmHg, BMI 33 kg/m². Labs: A1c 7.9%, eGFR 49 mL/min/1.73m², UACR 428 mg/g, potassium 4.9 mEq/L. Meds: Metformin 1000 mg bid, glipizide 20 mg qd, lisinopril 40 mg qd, metoprolol succinate 200 mg qd, rosuvastatin 40 mg qd, aspirin 81 mg qd. What might be appropriate at this time to reduce this patient's risk for progression of T2D and DKD?

N = 2,753 Matched responses

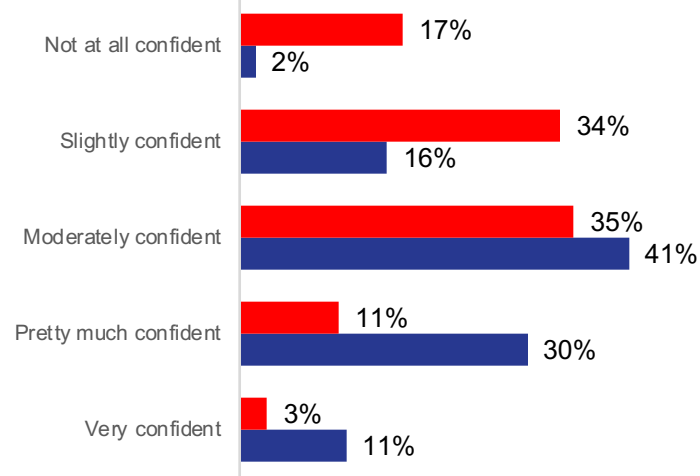


Confidence and Practice Strategy Items

Pre-Test
Post-Test

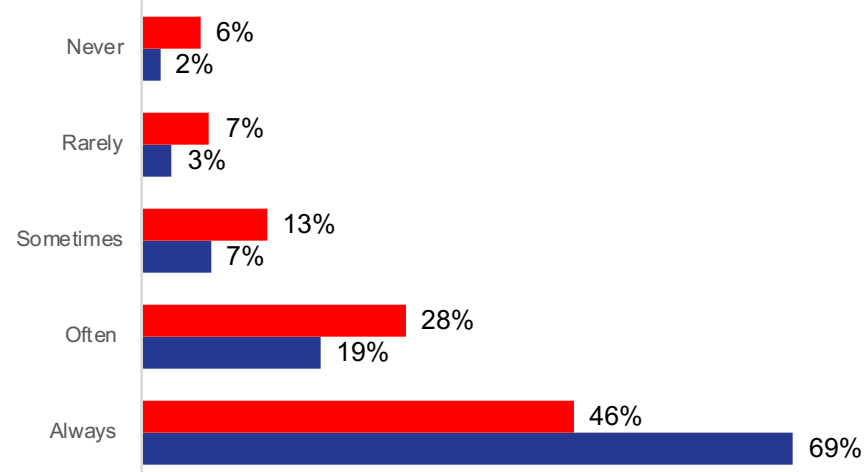
How confident are you in your ability to manage diabetic kidney disease?

N = 3,742 Matched responses



How often do you screen patients with T2D for diabetic kidney disease?

N = 3,065 Matched responses

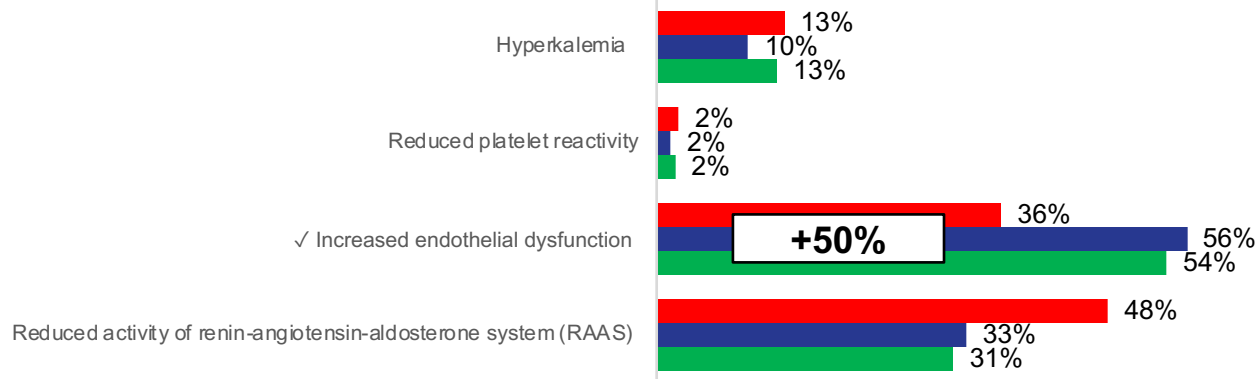


Knowledge Items

Post Curriculum Assessment (PCA)

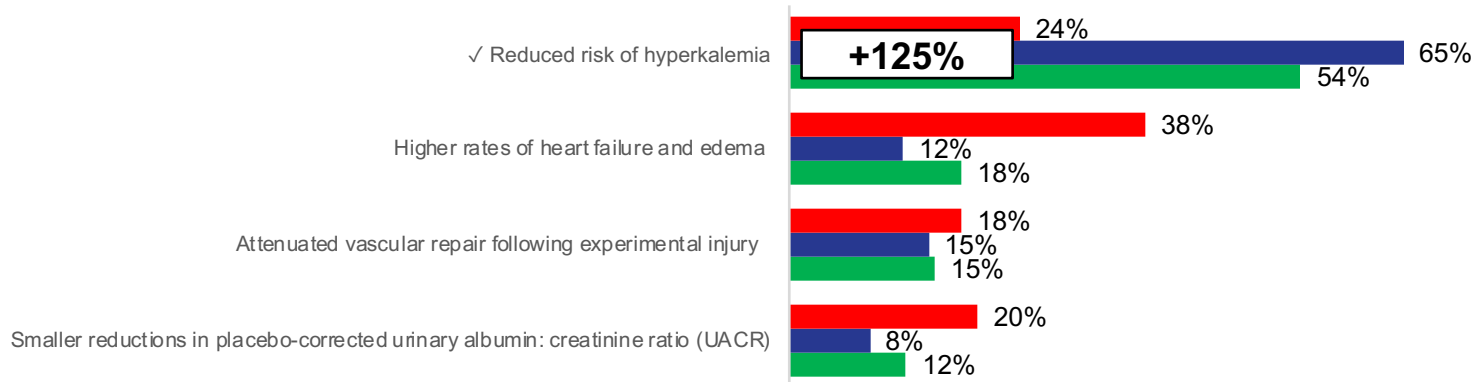


Which of the following is a mechanism by which diabetic kidney disease increases risk for cardiovascular disease?



N = 1,304 Matched responses

Compared to steroidal mineralocorticoid receptor antagonists (MRAs), non-steroidal MRAs appear to be associated with which of the following?



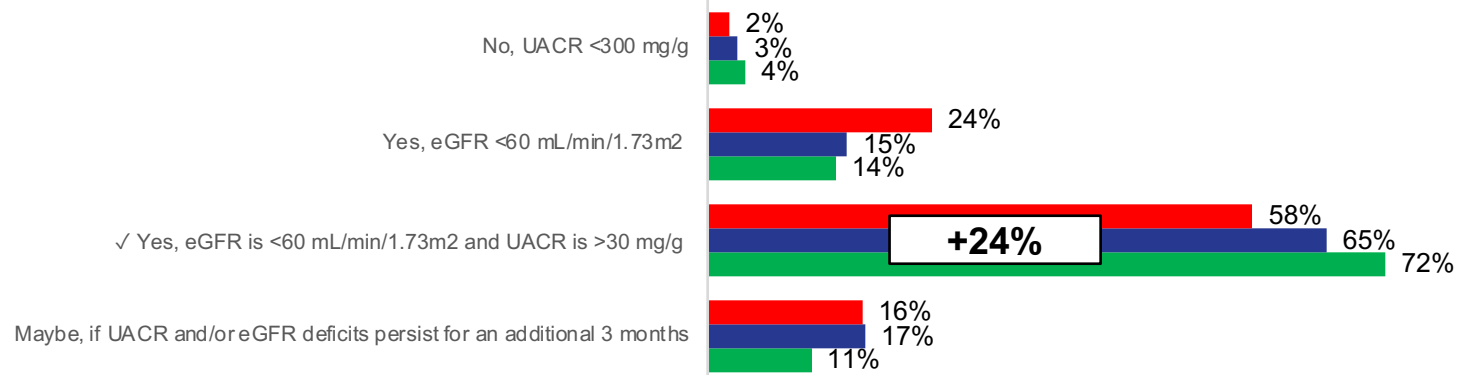
N = 1,171 Matched responses

Competence Items

Post Curriculum Assessment (PCA)

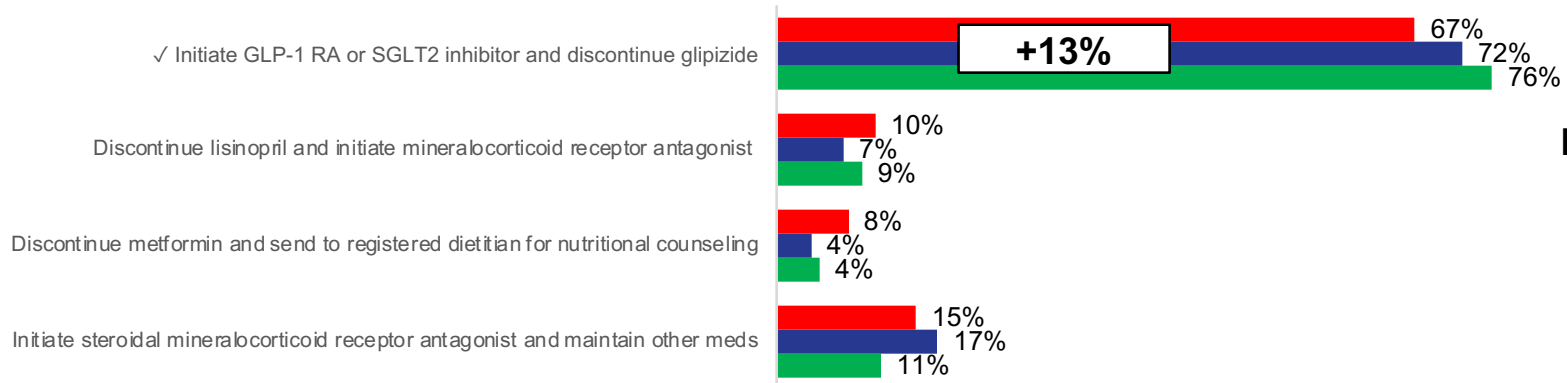


63 y/o man with 16-year history of T2D presents for checkup. Med Hx: Hypertension, dyslipidemia, stent placed 1 year ago for unstable angina. Exam: BP 142/84 mmHg, BMI 31 kg/m². Labs: A1c 7.6%, serum creatinine 1.4 mg/dL, eGFR 51 mL/min/1.73m², urine albumin:creatinine ratio (UACR) 286 mg/g, stable for 6 months. Based on this presentation, does this patient have diabetic kidney disease?



N = 679 Matched responses

65 y/o woman with 10-year history of T2D. Med Hx: Hypertension, dyslipidemia, DKD, NSTEMI 6 months ago. Exam: BP 132/72 mmHg, BMI 33 kg/m². Labs: A1c 7.9%, eGFR 49 mL/min/1.73m², UACR 428 mg/g, potassium 4.9 mEq/L. Meds: Metformin 1000 mg bid, glipizide 20 mg qd, lisinopril 40 mg qd, metoprolol succinate 200 mg qd, rosuvastatin 40 mg qd, aspirin 81 mg qd. What might be appropriate at this time to reduce this patient's risk for progression of T2D and DKD?



N = 1,224 Matched responses

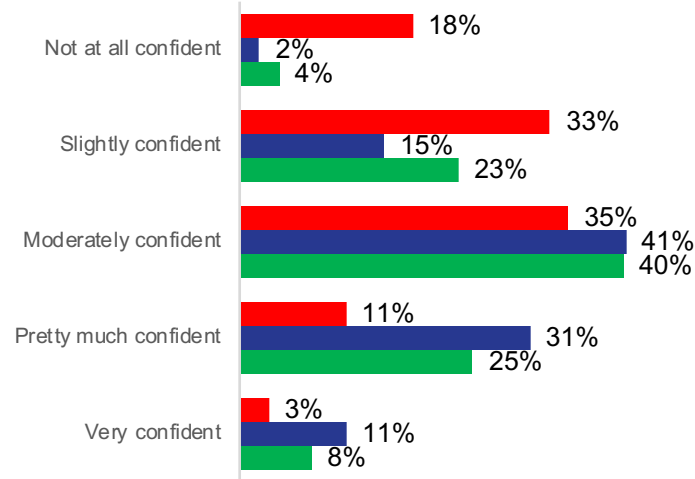
Confidence and Practice Strategy Items

Post Curriculum Assessment (PCA)

Pre-Test
Post-Test
PCA

How confident are you in your ability to manage diabetic kidney disease?

N = 1,593 Matched responses



How often do you screen patients with T2D for diabetic kidney disease?

N = 1,341 Matched responses

