Online-Only Supplementary Materials

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Supplementary Table 1. Attrition table

	N
Total number of patients aged 18-85 with ≥ 1 outpatient visit for evaluation and management with a PCP	**3,976,210**
Patients with Type 2 Diabetes Mellitus	**543,041**
end stage kidney disease or stage 5 CKD (excluded)	*13,351*
hospice care (excluded)	*5,591*
pregnant (excluded)	*1,854*
attributed to a clinical practice site with fewer than 30 patients (excluded)	*9,080*
Study Population	**513,165**

Supplementary Table 2. Frequency of testing by increasing time period across organizations and clinical practice sites.

| Number of tests in time period: mean (s.d)	Organizations (n=24), median [10th – 90th percentile]	Clinical practice sites (n=1,164), median [10th – 90th percentile]
eGFR		
1 year	2.10 (2.10) [1.80 (1.41) – 2.43 (2.70)]	2.09 (1.90) [1.31 (1.20) – 2.85 (3.05)]
2 years	4.49 (4.97) [3.72 (2.46) – 5.47 (6.53)]	4.54 (4.49) [2.79 (2.33) – 6.30 (7.17)]
3 years	6.32 (6.61) [5.34 (3.47) – 8.07 (9.52)]	6.63 (6.20) [3.80 (3.20) – 9.30 (10.04)]
uACR		
1 year	0.64 (0.68) [0.51 (0.58) – 0.83 (0.89)]	0.63 (0.58) [0.15 (0.40) – 0.93 (0.81)]
2 years	1.18 (1.05) [0.91 (0.89) – 1.54 (1.49)]	1.17 (0.85) [0.30 (0.58) – 1.71 (1.28)]
3 years	1.62 (1.42) [1.19 (1.17) – 2.12 (2.05)]	1.61 (1.12) [0.39 (0.69) – 2.42 (1.74)]
uA		
1 year	0.68 (0.67) [0.50 (0.59) – 0.89 (0.89)]	0.67 (0.59) [0.24 (0.45) – 0.94 (0.81)]
2 years	1.22 (1.05) [0.91 (0.91) – 1.66 (1.48)]	1.25 (0.87) [0.45 (0.63) – 1.75 (1.30)]
3 years	1.70 (1.41) [1.16 (1.17) – 2.33 (2.05)]	1.73 (1.16) [0.52 (0.75) – 2.48 (1.77)]
urine dipstick		
1 year	0.53 (1.04) [0.36 (0.84) – 0.72 (1.18)]	0.01 (0.13) [0.00 (0.00) – 0.07 (0.37)]
2 years	1.01 (1.69) [0.65 (1.40) – 1.35 (1.92)]	0.03 (0.21) [0.00 (0.00) – 0.12 (0.61)]
3 years	1.39 (2.22) [0.90 (1.85) – 1.97 (2.63)]	0.03 (0.26) [0.00 (0.00) – 0.15 (0.80)]
uPCR		
1 year	0.02 (0.19) [0.00 (0.03) – 0.05 (0.31)]	1.83 (1.01) [1.19 (0.84) – 2.24 (1.2)]
2 years	0.03 (0.32) [0.00 (0.04) – 0.08 (0.52)]	3.42 (1.70) [2.13 (1.38) – 4.23 (2.11)]
3 years	0.05 (0.41) [0.00 (0.06) – 0.11 (0.69)]	4.77 (2.43) [2.64 (1.85) – 6.03 (3.03)]

Supplementary Figure 1: Analysis Description
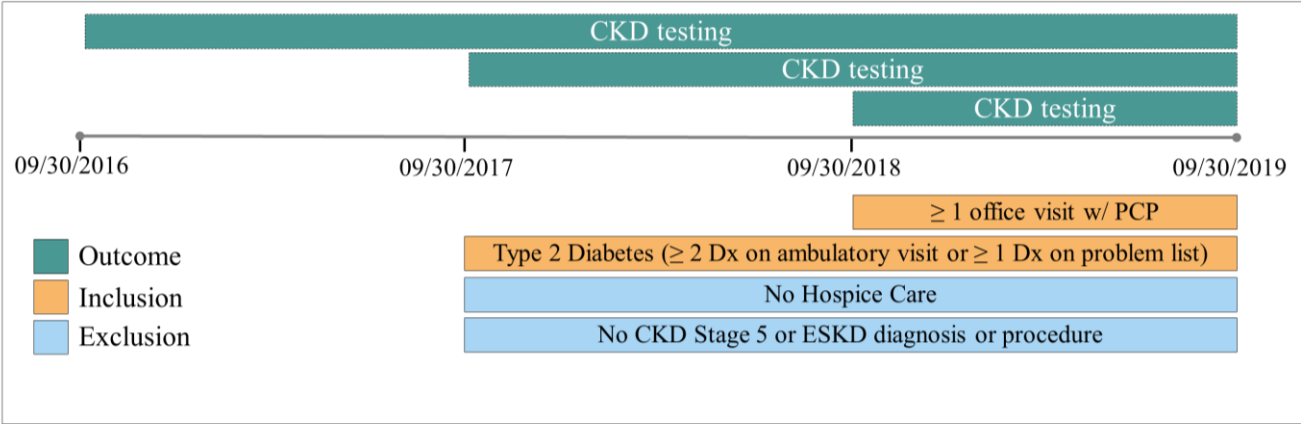
Supplementary Figure 2: Prevalence of detected elevated albuminuria (≥ 30 mg/g) and uACR testing rates, among all patients without an ACE-I or ARB and among patients who also have uACR tested.

A) All Patients, by Organization
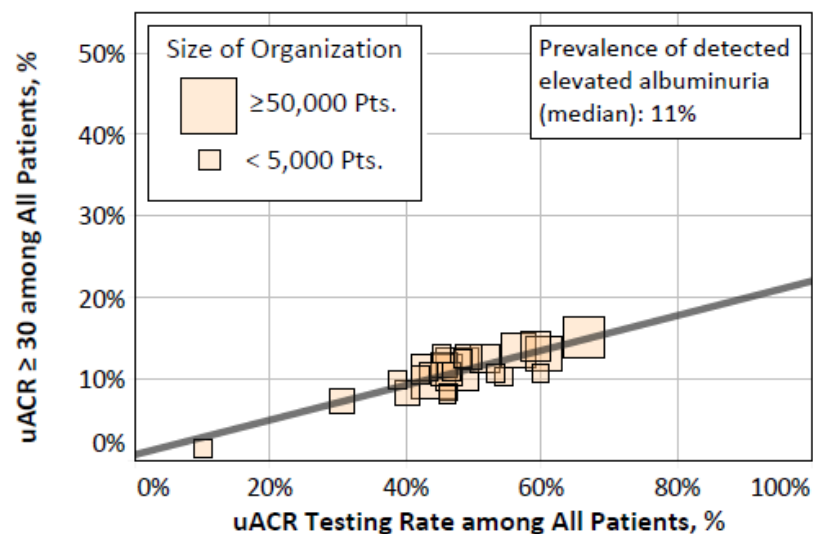
B) All Patients, by Clinical Practice Site
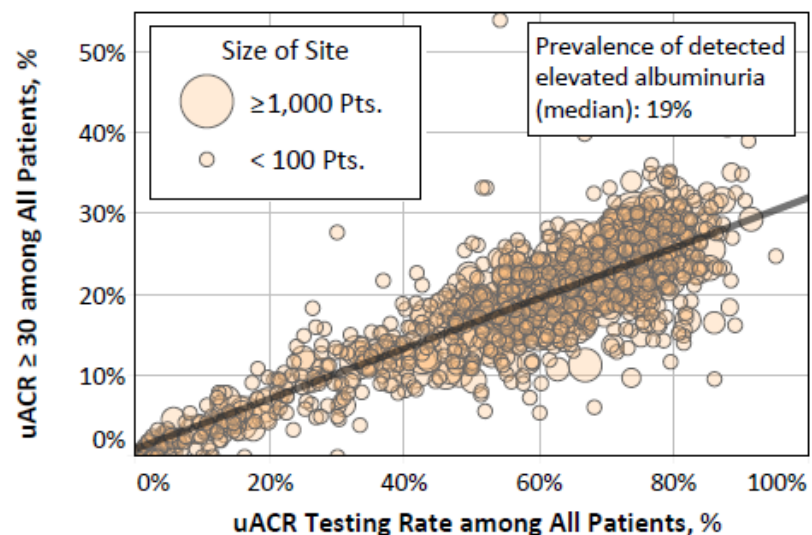
C) Patients with uACR Tested, by Organization
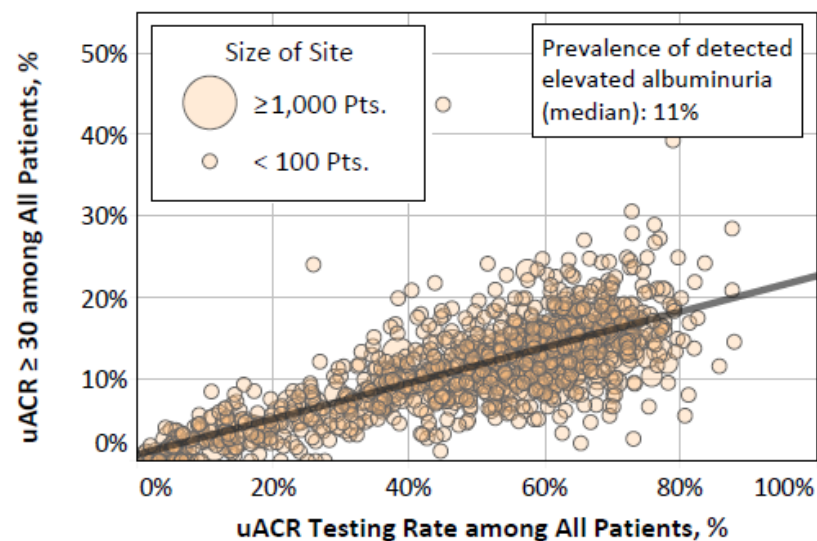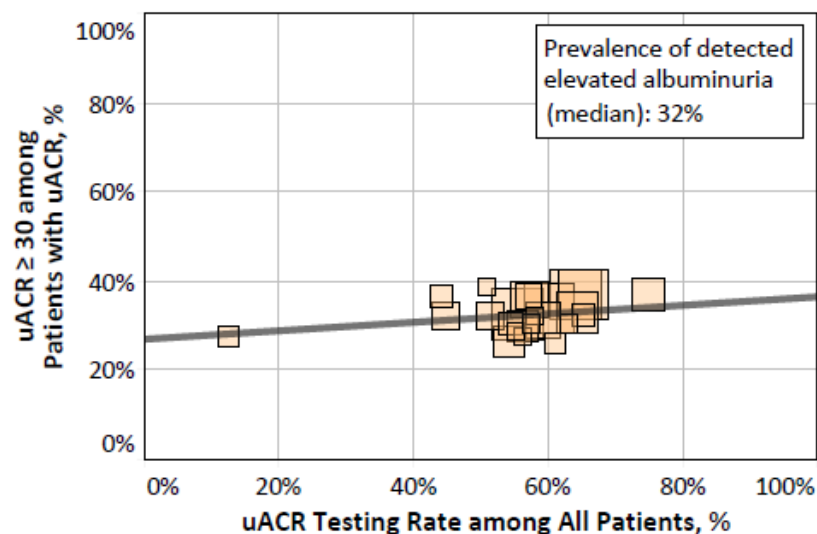
D) Patients with uACR Tested, by Clinical Practice Site

Supplementary Figure 3: Prevalence of detected elevated albuminuria (≥ 30 mg/g) and uACR testing rates, among all patients with an ACE-I or ARB and among patients who also have uACR tested.
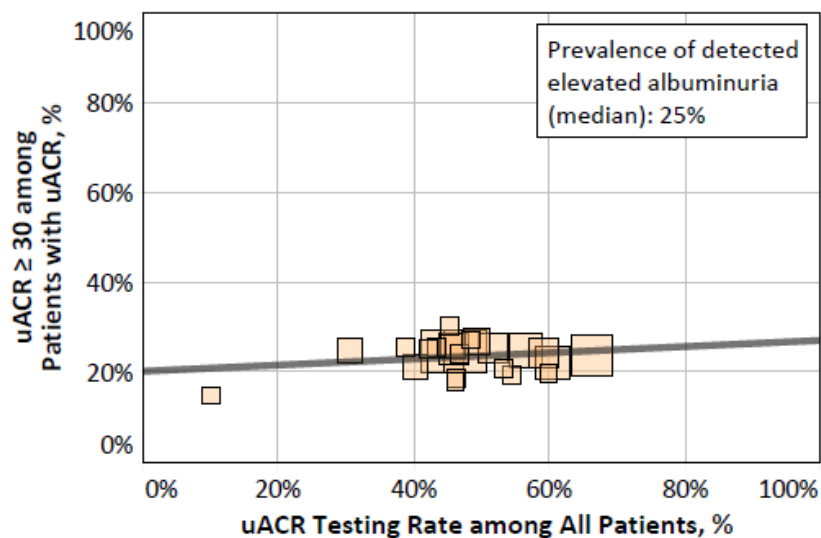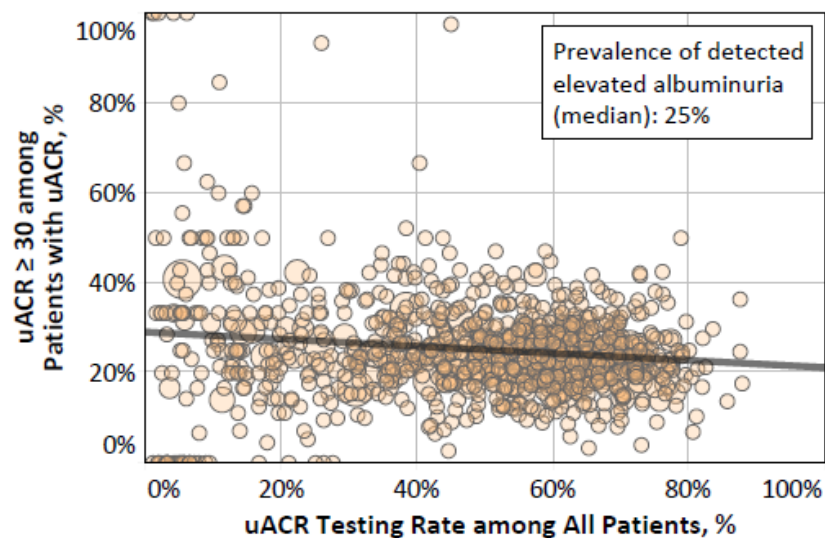

A) All Patients, by Organization

Size of Organization
■ ≥50,000 Pts.
□ < 5,000 Pts.

Prevalence of detected elevated albuminuria (median): 17%

y-axis: uACR ≥ 30 among All Patients, %
x-axis: uACR Testing Rate among All Patients, %

B) All Patients, by Clinical Practice Site

Size of Site
○ ≥1,000 Pts.
○ < 100 Pts.

Prevalence of detected elevated albuminuria (median): 19%

y-axis: uACR ≥ 30 among All Patients, %
x-axis: uACR Testing Rate among All Patients, %

C) Patients with uACR Tested, by Organization

Prevalence of detected elevated albuminuria (median): 32%

y-axis: uACR ≥ 30 among Patients with uACR, %
x-axis: uACR Testing Rate among All Patients, %

D) Patients with uACR Tested, by Clinical Practice Site

Prevalence of detected elevated albuminuria (median): 34%

y-axis: uACR ≥ 30 among Patients with uACR, %
x-axis: uACR Testing Rate among All Patients, %

Supplementary Figure 4: Risk classification of CKD by ACE-I/ARB prescribing, among patients with (A) and without (B) diagnosed CKD

A

ACE-I or ARB (n=57,423)

eGFR Category (ml/min/1.73㎡)	uACR Categories (mg/g)			
	A1: <30	A2: 30-300	A3: ≥ 300	Total
G1: ≥ 90	5.6%	6.9%	1.8%	14.2%
G2: 60-89	16.7%	13.7%	3.9%	34.3%
G3a: 45-59	15.2%	9.7%	3.5%	28.4%
G3b: 30-44	8.2%	7.1%	3.6%	18.9%
G4: 15-29	1.1%	1.5%	1.6%	4.2%
Total	46.7%	38.8%	14.4%	100.0%

No CKD	22.2%
Intermediate risk	35.7%
High risk	23.6%
Very high risk	18.3%

No ACE-I or ARB (n=18,736)

eGFR Category (ml/min/1.73㎡)	uACR Categories (mg/g)			
	A1: <30	A2: 30-300	A3: ≥ 300	Total
G1: ≥ 90	5.7%	4.4%	1.0%	11.1%
G2: 60-89	18.0%	10.3%	2.1%	30.4%
G3a: 45-59	16.1%	9.1%	2.8%	28.1%
G3b: 30-44	9.7%	8.4%	3.5%	21.7%
G4: 15-29	2.0%	3.2%	3.5%	8.8%
Total	51.6%	35.4%	13.0%	100.0%

No CKD	23.7%
Intermediate risk	30.8%
High risk	22.0%
Very high risk	23.6%

B

ACE-I or ARB (n=130,744)

eGFR Category (ml/min/1.73㎡)	uACR Categories (mg/g)			
	A1: <30	A2: 30-300	A3: ≥ 300	Total
G1: ≥ 90	28.1%	8.3%	1.1%	37.5%
G2: 60-89	39.0%	10.7%	1.6%	51.3%
G3a: 45-59	6.5%	2.4%	0.5%	9.4%
G3b: 30-44	1.0%	0.5%	0.2%	1.7%
G4: 15-29	0.0%	0.0%	0.0%	0.1%
Total	74.7%	21.9%	3.4%	100.0%

No CKD	67.1%
Intermediate risk	25.5%
High risk	6.1%
Very high risk	1.3%

No ACE-I or ARB (n=71,406)

eGFR Category (ml/min/1.73㎡)	uACR Categories (mg/g)			
	A1: <30	A2: 30-300	A3: ≥ 300	Total
G1: ≥ 90	36.9%	6.9%	0.7%	44.5%
G2: 60-89	39.7%	7.0%	0.7%	47.4%
G3a: 45-59	5.1%	1.5%	0.3%	6.9%
G3b: 30-44	0.7%	0.4%	0.1%	1.2%
G4: 15-29	0.0%	0.0%	0.0%	0.1%
Total	82.4%	15.9%	1.7%	100.0%

No CKD	76.6%
Intermediate risk	19.0%
High risk	3.5%
Very high risk	0.9%

Patients without eGFR or uACR in the past year were excluded. ACE-I and ARB prescribing ascertained in the past year. CKD diagnoses ascertained from outbound claims in the past 2 years using the 9th and 10th revisions of international classification of diseases (ICD). CKD risk categories: no CKD, eGFR ≥ 60 (mL/min/1.73m^2) and uACR < 30 (mg/g); moderate risk, eGFR 45 – 59 and uACR < 30, eGFR ≥ 60 and uACR 30 – 299; high risk, eGFR 30 – 44 and uACR < 30, eGFR 45 – 59 and uACR 30 – 299, eGFR ≥ 60 and uACR ≥ 300; very high risk, eGFR < 30 and uACR < 30, eGFR < 45 and uACR 30-299, eGFR < 60 and uACR ≥ 300.

Supplementary Figure 5: Patient characteristics associated with testing in the past year for both eGFR and uACR (A) and uACR only (B)
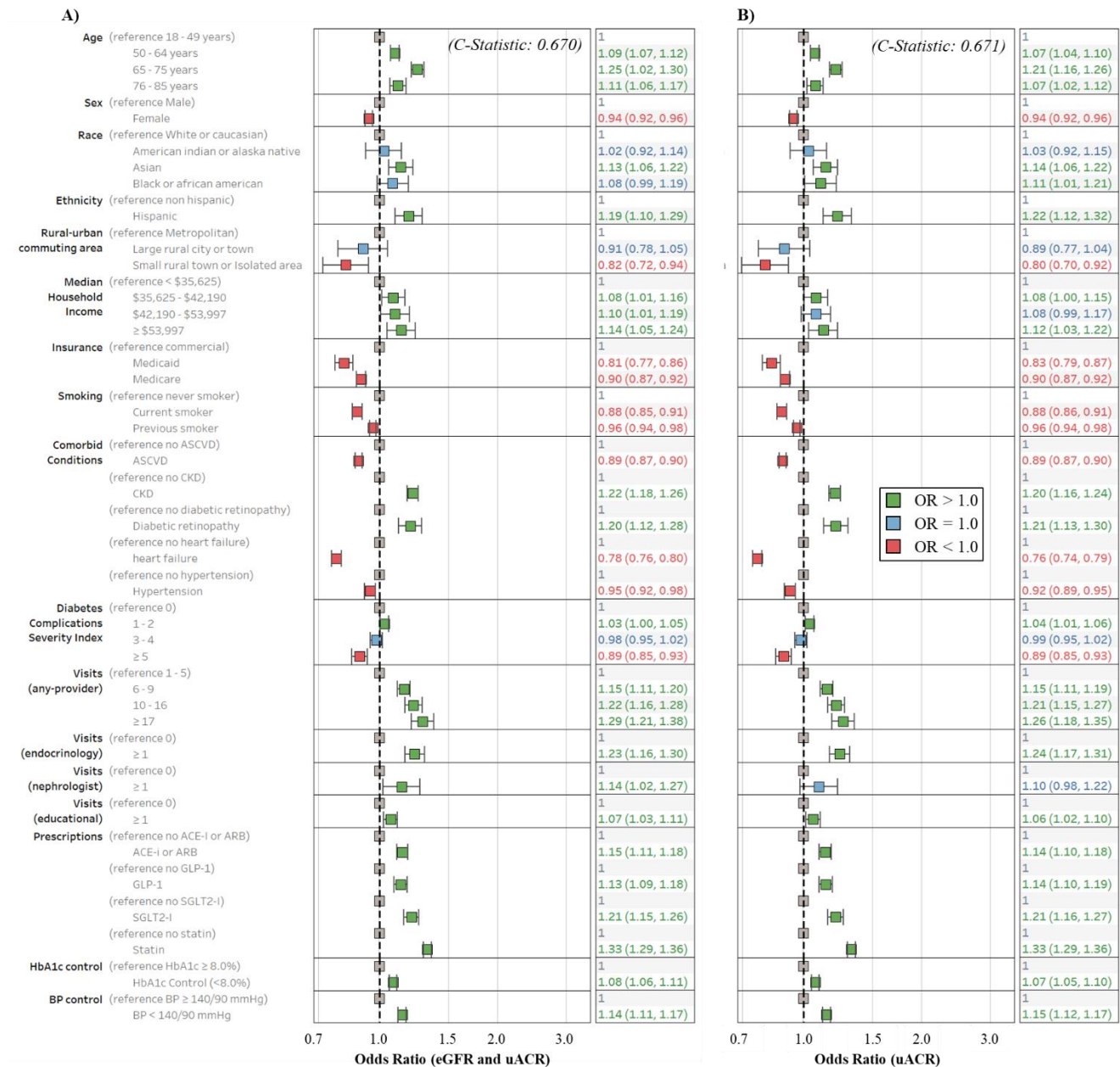
Odds ratios (OR) were calculated using logistic regression, adjusted for healthcare organization, and using robust standard errors clustered by clinical practice site (error bars show 95% confidence intervals). Odds ratio > 1.0 indicate increased odds of testing. For HbA1c control, odds ratio (OR) for no HbA1c measurement were OR $_{eGFR + uACR}$ 0.03 (0.03, 0.04); OR $_{uACR}$ 0.04 (0.04, 0.05). Abbreviations: ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; GLP-1 RA, glucagon-like peptide 1 receptor agonists; SGLT2 inhibitor, sodium-glucose cotransporter-2; ACE-I, angiotensin-converting enzyme inhibitors; ARB, angiotensin receptor blocker.

Supplementary Figure 6: Organization characteristics associated with testing in the past year of eGFR and uACR (A) and uACR only (B)
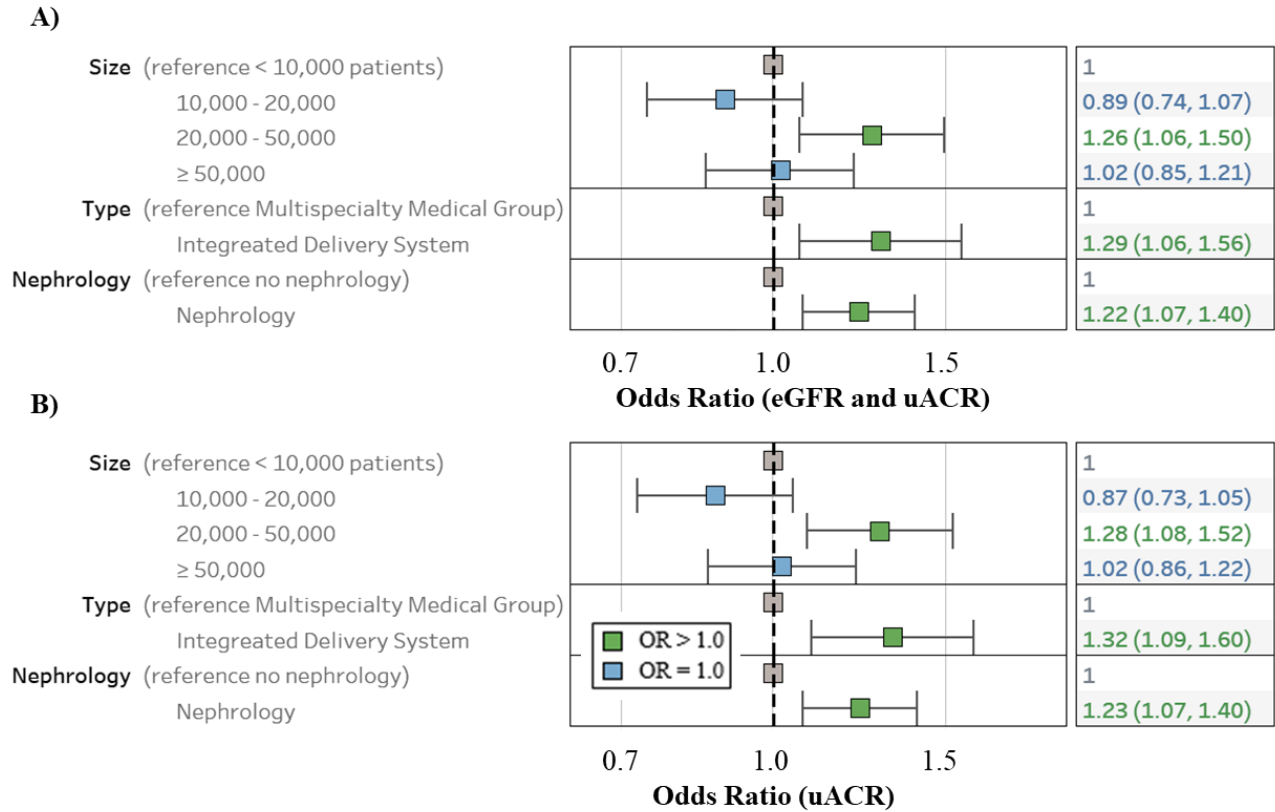
A)

|	
Size (reference < 10,000 patients)	1
10,000 - 20,000	0.89 (0.74, 1.07)
20,000 - 50,000	1.26 (1.06, 1.50)
≥ 50,000	1.02 (0.85, 1.21)
Type (reference Multispecialty Medical Group)	1
Integreated Delivery System	1.29 (1.06, 1.56)
Nephrology (reference no nephrology)	1
Nephrology	1.22 (1.07, 1.40)

Odds Ratio (eGFR and uACR)

B)

Size (reference < 10,000 patients)	1
10,000 - 20,000	0.87 (0.73, 1.05)
20,000 - 50,000	1.28 (1.08, 1.52)
≥ 50,000	1.02 (0.86, 1.22)
Type (reference Multispecialty Medical Group)	1
Integreated Delivery System	1.32 (1.09, 1.60)
Nephrology (reference no nephrology)	1
Nephrology	1.23 (1.07, 1.40)

OR > 1.0
OR = 1.0

Odds Ratio (uACR)

Odds ratios were calculated using logistic regression with robust standard errors clustered by clinical practice site (error bars show 95% confidence intervals). Adjusted for age, sex, race, ethnicity, insurance, rural urban commuting area, median household income, smoking, comorbid conditions (atherosclerotic cardiovascular disease, chronic kidney disease, diabetic retinopathy, heart failure, hypertension) diabetes complication severity index, utilization (visits with any provider, with nephrologists, with endocrinologist, and for education), medications prescribed (angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, glucagon-like peptide 1 receptor agonists, sodium-glucose cotransporter-2 inhibitors, statins), hemoglobin A1c control (< 8.0%), and blood pressure control (< 140/90 mmHg). Odds ratio > 1.0 indicate increased odds of testing.

Supplementary Figure 7: Distribution of adjustments by healthcare organization for eGFR and uACR (A) and uACR (B) models
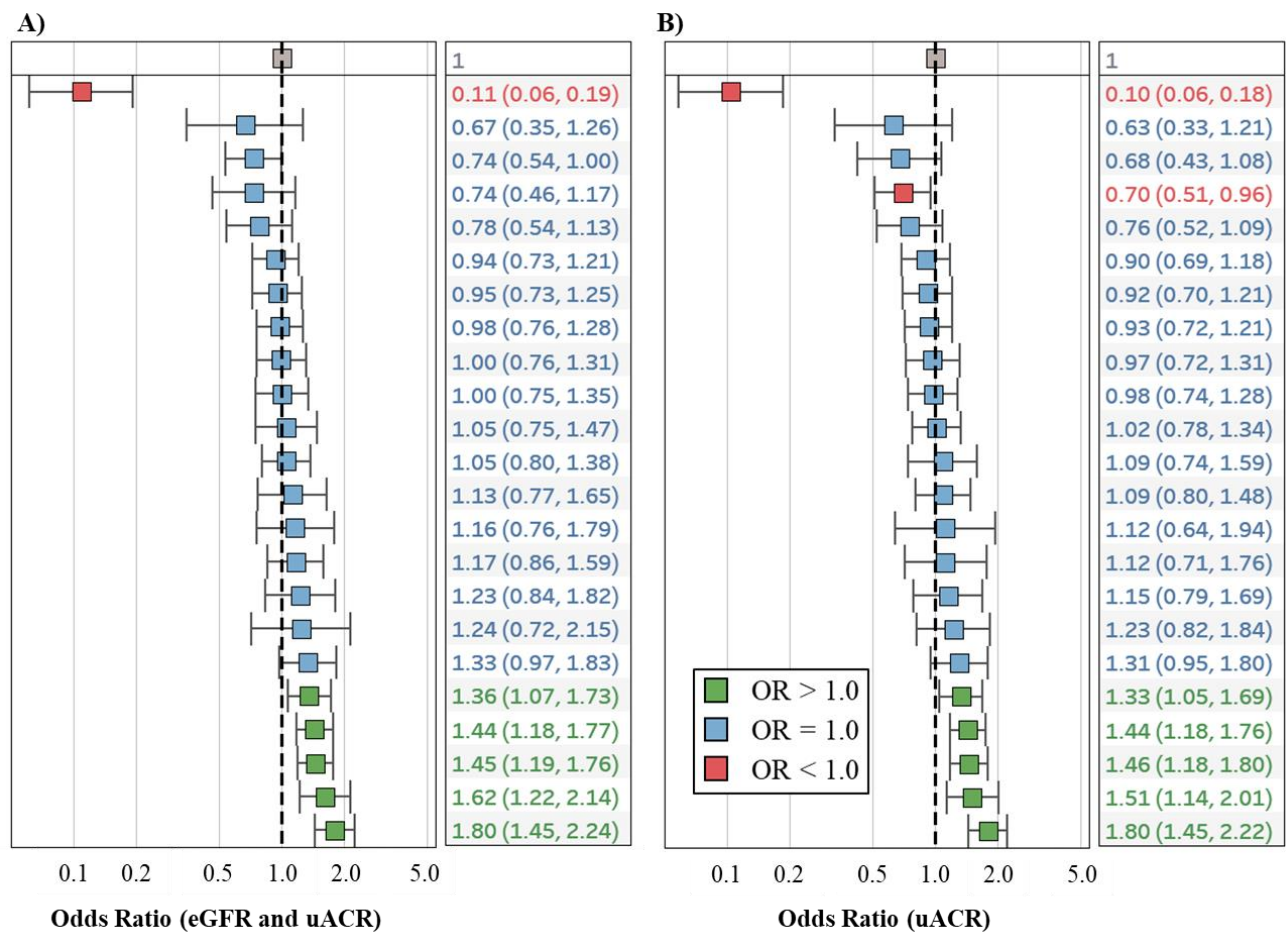
Odds ratios were calculated using logistic regression with robust standard errors clustered by clinical practice site (error bars show 95% confidence intervals). Adjusted for age, sex, race, ethnicity, insurance, rural urban commuting area, median household income, smoking, comorbid conditions (ASCVD, CKD, diabetic retinopathy, heart failure, hypertension) diabetes complication severity index, utilization (visits with any provider, with nephrologists, with endocrinologist, and for education), medications prescribed (ACE-I/ARB, GLP-1 RA, SGLT2 inhibitor, statin), HbA1c control (< 8.0%), and BP control (< 140/90 mmHg). Odds ratio > 1.0 indicate increased odds of testing.