Supplementary Table 1: Comparison of baseline characteristics of the subcohort included in the present study versus the entire CRIC cohort versus the CRIC subsample selected for GFR measurement by iothalamate clearance.

Characteristic	Subcohort included in current study (N=942) Mean ± SD, N (%), or Median (IQR)	CRIC cohort (N=3939) Mean ± SD, N (%), or Median (IQR)	CRIC subsample selected for iGFR measurement (N=1214) Mean ± SD, N (%), or Median (IQR)
Mean Age (years)	56.0 (± 11.8)	57.7 (± 11.0)	55.5 (± 12.5)
Female	407 (43.2%)	1778 (45.1%)	535 (44.1%)
Race			
Non-Hispanic White	428 (45.4%)	1638 (41.6%)	556 (45.8%)
Non-Hispanic Black	334 (35.5%)	1650 (41.9%)	495 (40.8%)
Hispanic	114 (12.1%)	497 (12.6%)	67 (5.5%)
Other	66 (7.0%)	154 (3.9%)	96 (7.9%)
Body Mass Index (kg/m^2)	31.3 (± 6.6)	32.1 (± 7.8)	31.3 (± 6.9)
Diabetes	411 (43.6%)	1908 (48.4%)	558 (46.0%)
Systolic Blood Pressure (mm Hg)	126.2 (± 20.3)	128.5 (± 22.2)	127.6 (± 21.0)
Diastolic Blood Pressure (mm Hg)	72.3(± 12.4)	71.6 (± 12.8)	72.4 (± 12.6)
History of cardiovascular disease	233 (24.7%)	1316 (33.4%)	331 (27.3%)
Congestive heart failure	47 (5.0%)	382 (9.7%)	79 (6.5%)
Peripheral vascular disease	42 (4.5%)	262 (6.7%)	73 (6.0%)
Stroke	72 (7.6%)	392 (10.0%)	102 (8.4%)
Myocardial infarction	146 (15.5%)	862 (21.9%)	213 (17.6%)
Median 24 hour urine albumin (gm/day)	0.04 (IQR 0.00-0.4)	0.06 (IQR 0.0-0.6)	0.06 (IQR 0.0-0.6)
Hemoglobin A1C (%)	6.4 (±1.5)	6.7 (± 1.6)	6.5 (± 1.6)

Low-density lipoprotein (mg/dL)	102.9 (± 35.2)	102.7 (± 35.6)	103.0 (± 36.3)
High-density lipoprotein (mg/dL)	47.1 (± 15.9)	47.5 (± 15.5)	47.6 (± 15.7)
Baseline renal function (mL/min/1.73 m^2)			
iGFR	51.1 (± 19.5)	48.0 (± 20.0)	49.2 (± 20.2)
eGFR$_{cr}$	46.4 (± 13.2)	42.9 (± 13.5)	45.2 (± 14.1)
eGFR$_{cys}$	59.2 (± 22.4)	53.1 (± 22.2)	57.3 (± 23.5)
CrCl	66.2 (± 31.7)	58.2 (± 30.7)	63.3 (± 32.7)
Mean (±SD) change in renal function between year 2 and baseline (mL/min/1.73m^2/2 years)			
eGFR$_{cr}$	-3.5 (± 8.9)	-2.7 (± 8.9)	-3.5 (± 8.7)
eGFR$_{cys}$	-4.4 (± 12.1)	-4.9 (± 12.0)	-5.1 (± 12.5)

Supplementary Table 2: Adjusted hazard ratios[1] for clinical outcomes (ESRD, cardiovascular event composite, congestive heart failure, and all-cause mortality) associated with each measure of kidney function.

Change over time in metric of kidney function	Adjusted HR[1] for every 5 mL/min/1.73m^2 decrease over 2 years (95% CI)	Adjusted HR[1] comparing the tertile of greatest renal function decline to other 2 tertiles (95% CI)
ESRD		
iGFR	1.45* (1.33, 1.58)	3.37* (2.39, 4.75)
eGFR$_{cr}$	2.03* (1.82, 2.26)	6.47* (4.48, 9.34)
eGFR$_{cys}$	1.57* (1.44, 1.72)	3.07* (2.16, 4.35)
CrCl	1.06* (1.02, 1.10)	1.84* (1.27, 2.67)
Cardiovascular event composite		
iGFR	1.09* (1.01, 1.17)	1.18 (0.82, 1.70)
eGFR$_{cr}$	1.17* (1.06, 1.29)	1.64* (1.14, 2.37)
eGFR$_{cys}$	1.10* (1.01, 1.20)	1.07 (0.74, 1.55)
CrCl	0.99 (0.96, 1.03)	0.86 (0.58, 1.29)
Congestive heart failure		
iGFR	1.09 (0.99, 1.20)	1.12 (0.71, 1.76)
eGFR$_{cr}$	1.21* (1.07, 1.36)	1.73* (1.09, 2.74)
eGFR$_{cys}$	1.14* (1.02, 1.27)	0.90 (0.57, 1.44)
CrCl	0.98 (0.94, 1.03)	1.01 (0.62, 1.66)
All-cause mortality		
iGFR	1.07 (0.96, 1.19)	1.54 (0.94, 2.50)
eGFR$_{cr}$	1.10 (0.95, 1.27)	1.87* (1.13, 3.09)
eGFR$_{cys}$	1.01 (0.89, 1.14)	1.32 (0.80, 2.18)
CrCl	1.00 (0.95, 1.05)	0.99 (0.57, 1.71)

[1]All hazard ratios (HR) are adjusted for age, sex, race/ethnicity, SBP (as continuous variable), total cholesterol (as continuous variable), diabetes status, history of any CVD, and renal function at Year 0.
* HR is statistically significantly associated ($p < 0.05$) with outcome

Supplementary Table 3: Unadjusted hazard ratios for clinical outcomes (ESRD, cardiovascular event composite, congestive heart failure, and all-cause mortality) associated with eGFR estimated using CKD-EPI equations.

Change over time in metric of kidney function	CKD-EPI$_{cr}$	CKD-EPI$_{cr-cys}$	CKD-EPI$_{cr}$	CKD-EPI$_{cr-cys}$
	Cox PH model using every 5 mL/min/1.73m^2 decrease over 2 years		Cox model comparing the tertile of greatest renal function decline to other 2 tertiles	
ESRD				
Hazard Ratio (95% CI)	1.48* (1.39, 1.58)	1.48* (1.38, 1.59)	4.78* (3.41, 6.70)	3.99* (2.87, 5.56)
C-statistic	0.75 (0.71, 0.79)	0.74 (0.70, 0.78)	0.70 (0.67, 0.74)	0.68 (0.64, 0.72)
Difference between C-statistics[1]	0.03 (-0.004, 0.07)	0.02 (-0.02, 0.05)	0.05¶ (0.005, 0.10)	0.03 (-0.01, 0.07)
Cardiovascular event composite				
Hazard Ratio (95% CI)	1.21* (1.11, 1.31)	1.21* (1.11, 1.31)	1.88* (1.33, 2.66)	1.87* (1.32, 2.64)
C-statistic	0.60 (0.54, 0.65)	0.60 (0.54, 0.65)	0.58 (0.54, 0.63)	0.58 (0.54, 0.63)
Difference between C-statistics[1]	0.01 (-0.04, 0.07)	0.01 (-0.04, 0.06)	0.03 (-0.02, 0.07)	0.03 (-0.02, 0.07)
Congestive heart failure				
Hazard Ratio (95% CI)	1.24* (1.12, 1.37)	1.24* (1.12, 1.38)	2.05* (1.34, 3.15)	1.92* (1.25, 2.95)
C-statistic	0.60 (0.53, 0.67)	0.60 (0.53, 0.67)	0.59 (0.53, 0.64)	0.59 (0.53, 0.64)
Difference between C-statistics[1]	0.01 (-0.05, 0.08)	0.02 (-0.04, 0.07)	0.03 (-0.02, 0.08)	0.03 (-0.02, 0.08)
All-cause mortality				
Hazard Ratio (95% CI)	1.08 (0.96, 1.21)	1.05 (0.93, 1.18)	2.00* (1.26,3.17)	1.71* (1.07, 2.72)
C-statistic	0.55 (0.47, 0.63)	0.54 (0.47, 0.61)	0.58 (0.52, 0.65)	0.57 (0.51, 0.62)
Difference between C-statistics[1]	-0.01 (-0.09, 0.07)	-0.02 (-0.10, 0.05)	0.02 (-0.04, 0.08)	0.003 (-0.05, 0.06)

[1]All C-statistics are compared to C-statistic for iGFR
*HR is statistically significantly associated (p<0.05) with outcome
¶C-statistic is statistically significantly different (p<0.05) compared to reference C-statistic (iGFR).