Table S1. Baseline characteristics of patients included in the analysis and those excluded patients because of missing baseline serumj bicarbonate levels, stratified by dialysis modality.

Variable	HD patients (n=130,632)		PD patients (n=11,887)	
	Included (n=110,951)	Excluded (n= 19,681)	Included (n=10,400)	Excluded (n= 1,487)
Age (years)	61 ± 15	61 ± 15	56 ± 15	55 ± 15
>65 years old (%)	45	43	31	28
Gender (% female)	45	43	47	49
Diabetes mellitus (%)	58	55	48	46
Race and/or ethnicity (%)				
Asian	3	3	4	3
Blacks	32	31	24	29
Hispanics	15	8	13	7
Whites	42	50	52	54
Others	6	7	7	6
Vintage (median, mo)	27 (11, 53)	29 (14, 53)	34 (15, 64)	49 (26, 85)
Primary insurance (%)				
Medicare	61	66	59	70
Medicaid	6	2	3	1
Private	11	3	13	3
Others	12	25	14	19

Marital status (%)				
Single	22	23	19	28
Married	37	51	45	52
Widow	13	11	7	6
Divorced	7	7	6	6
Co-morbid conditions (%)				
Atherosclerotic heart disease	21	23	15	15
Congestive heart failure	28	25	16	13
Other Cardiac disease	6	6	4	4
Cerebrovascular disease	8	7	5	5
Peripheral vascular disease	12	11	8	6
Chronic obstructive pulm dis	6	5	3	2
Cancer	4	5	4	4
Current Smokers	5	4	5	4
Weight (kg)	75 ± 21	80 ± 22	74 ± 19	76 ± 20
Body mass index (kg/m^2)	27 ± 7	28 ± 8	26 ± 6	27 ± 7
Serum albumin (g/dL)	3.7 ± 0.5	3.7 ± 0.5	3.6 ± 0.5	3.6 ± 0.5
Creatinine (mg/dL)	8.0 ± 3.3	8.2 ± 3.4	8.6 ± 3.7	9.0+ ± 4.0
Ferritin (ng/mL)	380 (180,712)	480 (247,764)	277 (122,584)	334 (157,662)
Total Iron Binding Capacity (mg/dl)	209 ± 46	207 ± 47	229 ± 54	221 ± 56

Calcium (mg/dL)	9.2 ± 0.7	9.1 ± 0.8	9.2 ± 0.8	9.1 ± 0.9
Phosphorus (mg/dL)	5.6 ± 1.5	5.6 ± 1.6	5.4 ± 1.5	5.8± 1.8
Parathyroid Hormone (pg/ml)	245 (143,418)	288 (170,504)	286 (158,524)	342 (186,678)
Alkaline Phosphatase (U/L)	98 (77, 131)	102 (78, 140)	97 (75, 131)	103 (77, 147)
Hemoglobin (g/dL)	12.0 ± 1.4	11.7 ± 1.5	12.0 ± 1.5	11.7 ± 1.6
WBC ($x10^3$/µl)	7.5 ± 2.5	7.4 ± 2.6	7.5 ± 2.6	7.9 ± 2.7
% lymphocyte	20.5 ± 8	19.9 ± 8.4	19.6 ± 8	19.3 ± 8.4

Table S2. Percentage of HD patients dialyzed with different bicarbonate concentrations in each strata of serum bicarbonate level.

Bicarbonate Concentration in Dialysate Bath. (meq/L)	Time Averaged Serum Bicarbonate level (meq/L)									
	<19 n=6,250	**19-<20 n=5,850**	**20-<21 n=8,923**	**21-<22 n=11,198**	**22-<23 n=12,143**	**23-<24 n=11,367**	**24-<25 n=8,565**	**25-<26 n=5,481**	**26-<27 n=3,074**	**≥27 n=2,722**
30	0.7%	0.4%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%	0.3%	0.4%
31	0.1%	0.1%	0.1%	0.1%	0.1%	< 0.1%	< 0.1%	0%	0%	0%
32	0.4%	0.4%	0.3%	0.3%	0.4%	0.4%	0.3%	0.2%	0.1%	< 0.1%
33	0.5%	0.8%	1%	1%	1%	1%	0.9%	1%	1%	0.6%
34	2%	1%	1%	1%	0.8%	0.6%	0.6%	0.3%	0.3%	0.4%
35	60%	60%	54%	54%	52%	50%	49%	46%	44%	38%
36	4%	5%	5%	5%	5%	4%	4%	3%	3%	2%
37	11%	10%	11%	11%	11%	12%	12%	13%	12%	12%
38	4%	4%	6%	6%	7%	7%	7%	7%	7%	6%
39	10%	10%	13%	13%	15%	16%	16%	17%	18%	20%
40	8%	8%	8%	8%	9%	9%	10%	11%	15%	21%

Table S3. Mean Kt/Vurea in sub-groups based upon serum and dialysate bicarbonate concentrations

Bicarbonate Concentration in Dialysate Bath (meq/L)	Time Averaged Serum Bicarbonate level (meq/L)									
	<19 n=6,250	**19-<20 n=5,850**	**20-<21 n=8,923**	**21-<22 n=11,198**	**22-<23 n=12,143**	**23-<24 n=11,367**	**24-<25 n=8,565**	**25-<26 n=5,481**	**26-<27 n=3,074**	**≥27 n=2,722**
30	1.4 ± 0.4	1.5 ± 0.2	1.4 ± 0.3	1.5 ± 0.3	1.4 ± 0.3	1.4 ± 0.2	1.6 ± 0.3	1.4 ± 0.4	1.5 ± 0.6	1.6 ± 0.2
31	1.5 ± 0.7	1.5 ± 0.3	1.6 ± 0.3	1.6 ± 0.2	1.8 ± 0.3	1.4 ± 0.2	1.4 ± 0.01	No pts.	No pts.	No pts.
32	1.3 ± 0.3	1.4 ± 0.3	1.5 ± 0.4	1.5 ± 0.4	1.6 ± 0.4	1.4 ± 0.3	1.6 ± 0.2	1.6 ± 0.4	1.7 ± 0.1	1.3 ± 0.4
33	1.7 ± 0.4	1.6 ± 0.5	1.5 ± 0.3	1.5 ± 0.3	1.6 ± 0.4	1.6 ± 0.3	1.5 ± 0.3	1.6 ± 0.4	1.6 ± 0.3	1.5 ± 0.2
34	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.4	1.6 ± 0.4	1.6 ± 0.3	1.6 ± 0.2	1.5 ± 0.4
35	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.4	1.5 ± 0.4	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.6 ± 0.3	1.6 ± 0.3
36	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.4	1.5 ± 0.3	1.5 ± 0.4	1.6 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.4	1.6 ± 0.4
37	1.6 ± 0.4	1.5 ± 0.4	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.6 ± 0.4
38	1.5 ± 0.4	1.6 ± 0.4	1.5 ± 0.4	1.5 ± 0.4	1.5 ± 0.3	1.6 ± 0.4	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.5
39	1.5 ± 0.4	1.6 ± 0.4	1.5± 0.4	1.5 ± 0.4	1.5 ± 0.4	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3	1.5 ± 0.3
40	1.5 ± 0.4	1.5 ± 0.4	1.5 ± 0.4	1.5 ± 0.3	1.6 ± 0.4	1.6 ± 0.4	1.6 ± 0.4	1.6 ± 0.4	1.6 ± 0.4	1.6 ± 0.4

Table S4. Results of the two sensitivity analyses summarizing hazards ratio for association of time-averaged serum bicarbonate and all-cause, cardiovascular, and infection-related mortality in patients treated with peritoneal dialysis.

Time averaged serum bicarbonate (meq/L)	Sensitivity Analyses One[1] (n=3,050)			Sensitivity Analyses Two[2] (n=4,577)		
	All-Cause Mortality	Cardiovascular Mortality	Infection-Related Mortality	All-Cause Mortality	Cardiovascular Mortality	Infection-Related Mortality
<19	1.40 (1.09 – 1.80)	1.44 (1.00 – 2.06)	1.10 (0.54 – 2.23)	1.48 (1.22 – 1.80)	1.66 (1.24 – 2.22)	1.43 (0.90 – 2.28)
19 - <20	1.26 (0.94 – 1.67)	1.35 (0.91 – 2.02)	1.17 (0.55 – 2.49)	1.24 (1.00 – 1.54)	1.40 (1.02 – 1.93)	1.21 (0.72 – 2.01)
20-<21	1.11 (0.87 – 1.41)	0.93 (0.65 – 1.34)	1.48 (0.82 – 2.67)	1.18 (0.98 – 1.42)	1.15 (0.86 – 1.54)	1.31 (0.85 – 2.20)
21-<22	1.24 (0.99 – 1.55)	0.94 (0.66 – 1.34)	1.79 (1.04 – 3.07)	1.29 (1.08 – 1.54)	1.29 (0.98 – 1.69)	1.47 (0.98 – 2.19)
22-<23	1.04 (0.84 – 1.29)	0.76 (0.54 – 1.06)	1.25 (0.73 – 2.13)	1.06 (0.90 – 1.26)	0.97 (0.74 – 1.27)	1.23 (0.83 – 1.81)
23-<24	0.93 (0.75 – 1.16)	0.74 (0.52 – 1.03)	0.91 (0.51 – 1.62)	0.97 (0.82 – 1.15)	0.87 (0.66 – 1.14)	1.04 (0.69 – 1.55)
24-<25	**Reference**	**Reference**	**Reference**	**Reference**	**Reference**	**Reference**
25-<26	1.07 (0.85 – 1.34)	0.94 (0.67 – 1.33)	1.41 (0.80 – 2.47)	1.02 (0.85 – 1.23)	1.02 (0.76 – 1.36)	1.15 (0.75 – 1.75)
26-<27	0.84 (0.64 – 1.11)	0.82 (0.54 – 1.24)	1.01 (0.51 – 1.99)	0.94 (0.76 – 1.16)	0.94 (0.68 – 1.31)	1.11 (0.69 – 1.79)
≥27	1.15 (0.88 – 1.49)	0.87 (0.57 – 1.32)	2.28 (1.29 – 4.04)	1.00 (0.82 – 1.22)	1.00 (0.73 – 1.37)	1.43 (0.93 – 2.20)

Using peritoneal dialysis patients with serum bicarbonate 24.0 to < 25.0 meq/Las reference group

[1] Including only patients with complete data for all variables.

[2] Body mass index and marital status excluded as covariates in model; missing data for other variables were imputed

Data adjusted for age, gender, race and/or ethnicity, diabetes, dialysis vintage, primary insurance, marital status, atherosclerotic heart disease, congestive heart failure, cerebrovascular disease, other cardiac diseases, peripheral vascular disease, chronic obstructive pulmonary disease, cancer,current smoking, body mass index, serum albumin, total iron binding capacity, ferritin, creatinine, calcium, phosphorus, parathyroid hormone, alkaline phosphatase, hemoglobin, white blood cell count, and percentage lymphocyte count

Table S5. Results of first sensitivity analyses for the association of time-averaged serum bicarbonate and all-cause, cardiovascular, and infection-related mortality in the entire cohort of peritoneal dialysis and hemodialysis patients. Analyses were limited to patients with complete data for all variables (peritoneal dialysis, n=3,050; hemodialysis, n=60,589).

Time averaged serum bicarbonate (mEq/L)	% of population		Adjusted Hazards Ratio (95% Confidence Interval)					
			All-Cause Mortality		Cardiovascular Mortality		Infection-Related Mortality	
	PD	HD	PD	HD	PD	HD	PD	HD
<19	7%	7%	1.44 (1.19 – 1.75)	1.43 (1.36 – 1.52)	1.83 (1.40 – 2.39)	1.58 (1.45 – 1.72)	1.02 (0.57 – 1.82)	1.75 (1.52 – 2.00)
19 - <20	6%	7%	1.22 (0.96 – 1.55)	1.26 (1.19 – 1.33)	1.61 (1.17 – 2.24)	1.26 (1.15 – 1.38)	1.10 (0.58 – 2.06)	1.38 (1.20 – 1.59)
20-<21	9%	11%	1.12 (0.93 – 1.35)	1.22 (1.16 – 1.28)	1.21 (0.91 – 1.61)	1.29 (1.19 – 1.39)	1.31 (0.85 – 2.04)	1.32 (1.17 – 1.49)
21-<22	11%	14%	1.18 (1.00 – 1.39)	1.12 (1.07 – 1.18)	1.11 (0.84 – 1.46)	1.16 (1.08 – 1.25)	1.53 (1.05 – 2.21)	1.19 (1.06 – 1.33)
22-<23	14%	16%	0.99 (0.85 – 1.16)	1.06 (1.01 – 1.11)	0.86 (0.66 – 1.12)	1.10 (1.02 – 1.18)	1.12 (0.78 – 1.61)	1.12 (1.00 – 1.25)
23-<24	14%	16%	0.91 (0.78 – 1.07)	1.01 (0.96 – 1.05)	0.88 (0.68 – 1.15)	1.05 (0.98 – 1.13)	0.80 (0.52 – 1.23)	1.01 (0.90 – 1.14)
24-<25	13%	12%	0.98 (0.84 – 1.14)	**Reference**	1.17 (0.93 – 1.46)	**Reference**	0.87 (0.59 – 1.30)	**Reference**
25-<26	10%	9%	1.05 (0.88 – 1.25)	0.98 (0.92 – 1.03)	1.13 (0.86 – 1.48)	0.95 (0.88 – 1.04)	1.26 (0.84 – 1.88)	0.98 (0.86 – 1.12)
26-<27	8%	5%	0.82 (0.65 – 1.03)	0.96 (0.90 – 1.03)	0.93 (0.66 – 1.31)	0.89 (0.80 – 0.98)	0.92 (0.53 – 1.59)	0.97 (0.82 – 1.13)

≥27	8%	5%	1.14 (0.92 – 1.41)	1.08 (1.02 – 1.15)	1.08 (0.76 – 1.52)	1.03 (0.93 – 1.14)	1.97 (1.32 – 2.95)	0.93 (0.79 – 1.10)

PD = peritoneal dialysis HD = hemodialysis

Using HD patients with serum bicarbonate 24.0 to <25.0 meq/L as reference group.

Data adjusted for age, gender, race and/or ethnicity, diabetes, dialysis vintage, primary insurance, marital status, atherosclerotic heart disease, congestive heart failure, cerebrovascular disease, other cardiac diseases, peripheral vascular disease, chronic obstructive pulmonary disease, cancer,current smoking, body mass index, serum albumin, total iron binding capacity, ferritin, creatinine, calcium, phosphorus, parathyroid hormone, alkaline phosphatase, hemoglobin, white blood cell count, and percentage lymphocyte count.

Table S6. Results of second sensitivity analyses for the association of time-averaged serum bicarbonate and all-cause, cardiovascular, and infection-related mortality in the entire cohort of peritoneal dialysis (n=4,577) and hemodialysis (n=83,940) patients. Models were built without including body mass index or marital status as covariates; missing data for other variables were imputed.

Time averaged serum bicarbonate (mEq/L)	% of population		Adjusted Hazards Ratio (95% Confidence Interval)					
			All-Cause Mortality		Cardiovascular Mortality		Infection-Related Mortality	
	PD	HD	PD	HD	PD	HD	PD	HD
<19	7%	7%	1.46 (1.26 – 1.70)	1.42 (1.36 – 1.48)	1.77 (1.42 – 2.19)	1.55 (1.45 – 1.66)	1.50 (1.05 – 2.14)	1.61 (1.45 – 1.80)
19 - <20	6%	7%	1.21 (1.02 – 1.44)	1.24 (1.19 – 1.30)	1.47 (1.14 – 1.89)	1.26 (1.17 – 1.35)	1.23 (0.81 – 1.87)	1.42 (1.28 – 1.59)
20-<21	9%	11%	1.15 (1.00 – 1.33)	1.16 (1.12 – 1.21)	1.23 (0.98 – 1.53)	1.24 (1.16 – 1.32)	1.33 (0.96 – 1.84)	1.27 (1.16 – 1.40)
21-<22	12%	14%	1.20 (1.06 – 1.37)	1.09 (1.05 – 1.14)	1.29 (1.06 – 1.58)	1.13 (1.06 – 1.19)	1.44 (1.09 – 1.91)	1.15 (1.05 – 1.26)
22-<23	14%	16%	1.00 (0.88 – 1.12)	1.05 (1.01 – 1.08)	0.97 (0.80 – 1.18)	1.08 (1.02 – 1.15)	1.21 (0.93 – 1.58)	1.09 (1.00 – 1.19)
23-<24	14%	15%	0.92 (0.82 – 1.04)	1.01 (0.97 – 1.05)	0.89 (0.73 – 1.09)	1.07 (1.01 – 1.13)	1.02 (0.77 – 1.35)	1.03 (0.94 – 1.13)
24-<25	12%	12%	0.93 (0.82 – 1.05)	**Reference**	0.99 (0.82 – 1.21)	**Reference**	0.94 (0.70 – 1.27)	**Reference**
25-<26	10%	8%	0.96 (0.84 – 1.10)	0.96 (0.92 – 1.00)	1.01 (0.81 – 1.26)	0.97 (0.90 – 1.03)	1.14 (0.84 – 1.56)	0.99 (0.89 – 1.10)

26-<27	7%	5%	0.85 (0.72 – 1.01)	0.93 (0.89 – 0.98)	0.91 (0.70 – 1.20)	0.92 (0.84 – 0.99)	1.08 (0.74 – 1.57)	0.88 (0.78 – 1.00)
≥27	8%	5%	0.95 (0.82 – 1.11)	1.04 (0.99 – 1.10)	1.02 (0.80 – 1.31)	1.03 (0.96 – 1.12)	1.42 (1.04 – 1.94)	0.94 (0.83 – 1.07)

PD = peritoneal dialysis HD = hemodialysis

Using HD patients with serum bicarbonate 24.0 to <25.0 meq/L as reference group.

Data adjusted for age, gender, race and/or ethnicity, diabetes, dialysis vintage, primary insurance, atherosclerotic heart disease, congestive heart failure, cerebrovascular disease, other cardiac diseases, peripheral vascular disease, chronic obstructive pulmonary disease, cancer, current smoking, serum albumin, total iron binding capacity, ferritin, creatinine, calcium, phosphorus, parathyroid hormone, alkaline phosphatase, hemoglobin, white blood cell count, and percentage lymphocyte count. Body mass index and marital status excluded in model.

Table S7. Association of time-averaged serum bicarbonate and all-cause, cardiovascular, and infection-related mortality in patients treated with peritoneal dialysis (n=10,400) and hemodialysis (n=110,951). For this analysis, 3 meq/L was added to the measured serum bicarbonate level of hemodialysis patients only to yield an "adjusted" time-averaged serum bicarbonate level

Time averaged serum bicarbonate (meq/L)	% of population		Adjusted Hazards Ratio (95% Confidence Interval)					
			All-Cause Mortality		Cardiovascular Mortality		Infection-Related Mortality	
	PD	HD	PD	HD	PD	HD	PD	HD
<19	5%	8%	1.23 (1.06– 1.45)	1.61 (1.43 – 1.81)	1.47 (1.18 – 1.84)	1.61 (1.34 – 1.93)	0.95 (0.61 – 1.48)	1.88 (1.43– 2.47)
19 - <20	4%	7%	1.14 (0.96– 1.36)	1.40 (1.27 – 1.55)	1.27 (0.98 – 1.63)	1.41 (1.22 – 1.64)	1.12 (0.73 – 1.73)	1.50 (1.18 – 1.90)
20-<21	7%	11%	1.10 (0.96– 1.27)	1.31 (1.23 – 1.40)	1.07 (0.86 – 1.34)	1.36 (1.23- 1.50)	1.32 (0.96 – 1.83)	1.74 (1.50 – 2.01)
21-<22	9%	14%	1.11 (0.98– 1.26)	1.36 (1.30– 1.43)	1.15 (0.95 – 1.40)	1.45 (1.35– 1.56)	1.30 (0.97 – 1.73)	1.49 (1.32 – 1.68)
22-<23	11%	15%	1.07 (0.96 – 1.21)	1.18 (1.13– 1.23)	1.00 (0.83 – 1.20)	1.16 (1.09– 1.24)	1.25 (0.96 – 1.62)	1.29 (1.16 – 1.42)
23-<24	13%	15%	1.06 (0.94- 1.20)	1.16 (1.12 – 1.20)	0.98 (0.81 – 1.19)	1.16 (1.10– 1.23)	1.15 (0.86 – 1.53)	1.26 (1.15 – 1.38)
24-<25	13%	12%	1.08 (0.96 – 1.21)	1.11 (1.07-1.15)	1.16 (0.97 – 1.38)	1.11 (1.05-1.17)	1.09 (0.82 – 1.46)	1.14 (1.05-1.24)
25-<26	12%	8%	1.10 (0.96 – 1.27)	1.04 (1.00 – 1.08)	1.09 (0.88 – 1.36)	1.04 (0.99– 1.09)	1.41 (1.04– 1.92)	1.06 (0.98 – 1.16)
26-<27	10%	5%	0.99 (0.84- 1.17)	**Reference**	0.96 (0.73 – 1.25)	**Reference**	1.29 (0.89 – 1.88)	**Reference**

≥27	16%	5%	1.23 (1.05 – 1.44)	0.98 (0.95-1.01)	1.19 (0.93 – 1.53)	0.92 (0.88 – 0.96)	1.88 (1.36 – 2.60)	0.89 (0.92 – 1.07)

Data adjusted for age, gender, race and/or ethnicity, diabetes, dialysis vintage, primary insurance, marital status, atherosclerotic heart disease, congestive heart failure, cerebrovascular disease, other cardiac diseases, peripheral vascular disease, chronic obstructive pulmonary disease, cancer, current smoking, body mass index, serum albumin, total iron binding capacity, ferritin, creatinine, calcium, phosphorus, parathyroid hormone, alkaline phosphatase, hemoglobin, white blood cell count, and percentage lymphocyte count