SUPPLEMENTAL MATERIAL

Table S1. Associations of FGF-23 and incident unclassified HF (Hazard ratios for each 20 pg/ml higher FGF-23 concentration): The Multi-Ethnic Study of Atherosclerosis.

Model	Incident unclassified HF events	Hazard ratio (95% CI)	P value
Model 1	49	1.28 (0.97-1.68)	0.078
Model 2	49	1.08 (0.77-1.53)	0.649
Model 3	48	1.02 (0.72-1.46)	0.907
Model 4	48	0.91 (0.59, 1.42)	0.683

Cox proportional models were used to calculate the hazards ratios for the development of incident HF, HFrEF and HFpEF with each 20 pg/ml higher serum FGF-23 concentration. Model 1; unadjusted, Model 2; adjusted for age, sex, race/ethnicity, education, study site, height and weight Model 3 adjusted for model 2 and systolic blood pressure, antihypertensive medications, diabetes mellitus, smoking, C-reactive protein, urine albumin-creatinine ratio and eGFR$_{CKD-EPI}$.

Table S2. Associations of FGF-23 and incident HFpEF before and after adjustment for LV mass (Hazard ratios for each 20 pg/ml higher FGF-23 concentration): The Multi-Ethnic Study of Atherosclerosis.

Model	Incident HFpEF events	Hazard ratio (95% CI)	P value
Model 4	93	1.31 (1.09, 1.57)	0.033
Model 4 + LV mass	93	1.28 (1.02, 1.62)	0.035

Cox proportional models were used to calculate the hazards ratios for the development of incident HFpEF with each 20 pg/ml higher serum FGF-23 concentration. (Only participants with baseline CMR derived LV mass were included N= 4827). Model 3; adjusted for age, sex, race/ethnicity, education, study site, height, weight, systolic blood pressure, antihypertensive medications, diabetes mellitus, smoking, C-reactive protein, urine albumin-creatinine ratio and eGFR$_{CKD-EPI.}$

Table S3. Associations of FGF-23 and incident HF, HFrEF and HFpEF (Hazard ratios for each 20 pg/ml higher FGF-23 concentration using time-updated covariates): The Multi-Ethnic Study of Atherosclerosis.

		Participants (n)	Events (n)	Model 1	Model 2	Model 3	Model 4
				HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
Incident HF							
FGF-23	per 20 pg/L increase	6542	291	1.34 (1.21, 1.48)	1.22 (1.10, 1.35)	1.14 (1.01, 1.29)	1.17 (1.01, 1.35)
Incident HFrEF							
FGF-23	per 20 pg/L increase	6542	176	1.28 (1.11, 1.48)	1.17 (1.02, 1.35)	1.07 (0.90, 1.26)	1.02 (0.82, 1.26)
Incident HFpEF							
FGF-23	per 20 pg/L increase	6542	149	1.44 (1.27, 1.62)	1.27 (1.12, 1.45)	1.18 (1.02, 1.39)	1.25 (1.03, 1.50)

Cox proportional models were used to calculate the hazards ratios for the development of incident HF, HFrEF and HFpEF with each 20 pg/ml higher serum FGF-23 concentration and again with quartiles of FGF-23. Model 1; unadjusted, Model 2; adjusted for age, sex, race/ethnicity, education, study site, height and weight; Model 3 adjusted for model 2 and systolic blood pressure, antihypertensive medications, diabetes mellitus, smoking, C-reactive protein, urine albumin-creatinine ratio and eGFR$_{CKD-EPI.}$ Model 4 is further adjusted for NT-proBNP, 25(OH)vitd, PTH and Phosphate.

Table S4. Associations of FGF-23 and incident HFrEF and HFpEF (Hazard ratios for each 20 pg/ml higher FGF-23 concentration using complete case analysis): The Multi-Ethnic Study of Atherosclerosis.

		Participants (n)	Events (n)	Model 1	Model 2	Model 3	Model 4
				HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
Incident HFrEF							
FGF-23	per 20 pg/L increase	6542	151	1.37 (1.16, 1.61)	1.31 (1.09, 1.59)	1.20 (0.98, 1.47)	1.13 (0.93, 1.41)
	Q1	1638	19	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)
	Q2	1636	36	1.86 (0.99, 3.48)	1.70 (0.90, 3.18)	1.77 (0.94, 3.33)	1.75 (0.93, 3.30)
	Q3	1634	46	2.10 (1.13, 3.87)	1.79 (0.96, 3.32)	1.91 (1.02, 3.57)	1.78 (0.95, 3.35)
	Q4	1634	50	2.71 (1.49, 4.90)	2.08 (1.14, 3.82)	1.92 (1.03, 3.61)	1.75 (0.92, 3.31)
Incident HFpEF							
FGF-23	per 20 pg/L increase	6542	134	1.48 (1.28, 1.71)	1.37 (1.16, 1.63)	1.32 (1.11, 1.57)	1.31 (1.09, 1.57)
	Q1	1638	22	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)
	Q2	1636	24	1.06 (0.54, 2.10)	0.92 (0.46, 1.82)	0.97 (0.49, 1.92)	0.96 (0.48, 1.91)
	Q3	1634	35	1.90 (1.04, 3.47)	1.46 (0.80, 2.69)	1.59 (0.86, 2.94)	1.53 (0.82, 2.83)
	Q4	1634	53	2.81 (1.58, 4.97)	1.86 (1.04, 3.34)	1.89 (1.03, 3.46)	1.77 (0.96, 3.27)

Model 1; unadjusted, Model 2; adjusted for age, sex, race/ethnicity, education, study site, height and weight; Model 3 adjusted for model 2 and systolic blood pressure, antihypertensive medications, diabetes mellitus, smoking, C-reactive protein, urine albumin-creatinine ratio and eGFR$_{CKD-EPI.}$ Model 4 is further adjusted for NT-proBNP, 25(OH)vitd, PTH and Phosphate.