

SUPPLEMENTARY MATERIAL

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Manuscript Title: Net Budgetary Impact of Ferric Citrate as a First-Line Phosphate Binder for the Treatment of Hyperphosphatemia: A Markov Microsimulation Model

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Table S1: Patient Characteristics

	N = 25,950
Age, years	
mean \pm SD	57.4 \pm 14.3
median [p25, p75]	58 [48, 68]
Gender, n (%)	
Male	13,416 (51.7)
Female	12,534 (48.3)
Race, n (%)	
White	6100 (23.5)
Black	11,925 (46.0)
Hispanic	6287 (24.2)
Asian	1638 (6.3)
Vascular access, n (%)	
Arteriovenous fistula	17,079 (65.8)
Arteriovenous graft	2882 (11.1)
Central venous catheter	5986 (23.1)
Dialysis vintage, months	
mean \pm SD	53.4 \pm 47.0
median [p25, p75]	40 [20, 72]

Table S2: Transition Matrix: Change in Binder Strength by Starting Binder Strength and Starting Serum Phosphorus Concentration

n (%)	Starting Binder Strength				
	0	1/1.5	2/2.5	3/3.5	4+
Starting Phos < 3.5 mg/dL					
Δ Strength -2.0	-	-	2384 (25.6)	127 (23.5)	65 (33.7)
Δ Strength -1.5	-	1099 (13.4)	25 (0.3)	65 (12.0)	1 (0.5)
Δ Strength -1.0	-	777 (9.5)	89 (1.0)	27 (5.0)	2 (1.0)
Δ Strength -0.5	-	49 (0.6)	62 (0.7)	3 (0.6)	1 (0.5)
Δ Strength 0.0	9402 (79.1)	6054 (73.8)	6656 (71.6)	309 (57.2)	124 (64.3)
Δ Strength +0.5	-	91 (1.1)	4 (0.0)	6 (1.1)	-
Δ Strength +1.0	417 (3.5)	71 (0.9)	28 (0.3)	1 (0.2)	-
Δ Strength +1.5	602 (5.1)	29 (0.4)	19 (0.2)	-	-
Δ Strength +2.0	1465 (12.3)	36 (0.4)	32 (0.3)	2 (0.4)	-
Total	11,886 (100.0)	8206 (100.0)	9299 (100.0)	540 (100.0)	193 (100.0)
Starting Phos 3.5-5.5 mg/dL					
Δ Strength -2.0	-	-	15,502 (26.1)	735 (23.1)	535 (44.1)
Δ Strength -1.5	-	5419 (12.9)	82 (0.1)	319 (10.0)	9 (0.7)
Δ Strength -1.0	-	3712 (8.8)	389 (0.7)	207 (6.5)	8 (0.7)
Δ Strength -0.5	-	167 (0.4)	265 (0.5)	15 (0.5)	7 (0.6)
Δ Strength 0.0	51,495 (76.8)	31,141 (74.0)	42,538 (71.6)	1855 (58.3)	651 (53.7)
Δ Strength +0.5	-	674 (1.6)	22 (0.0)	28 (0.9)	1 (0.1)
Δ Strength +1.0	2210 (3.3)	498 (1.2)	142 (0.24)	14 (0.4)	1 (0.1)
Δ Strength +1.5	3334 (5.0)	185 (0.4)	148 (0.3)	6 (0.2)	-
Δ Strength +2.0	9984 (14.9)	306 (0.7)	297 (0.5)	2 (0.1)	-
Total	67,023 (100.0)	42,102 (100.0)	59,385 (100.0)	3181 (100.0)	1212 (100.0)
Starting Phos 5.6-6.5 mg/dL					
Δ Strength -2.0	-	-	3971 (25.7)	279 (24.7)	201 (42.8)
Δ Strength -1.5	-	1047 (13.1)	33 (0.2)	104 (9.2)	3 (0.6)
Δ Strength -1.0	-	680 (8.5)	106 (0.7)	82 (7.2)	6 (1.3)
Δ Strength -0.5	-	27 (0.3)	67 (0.4)	7 (0.6)	4 (0.9)
Δ Strength 0.0	13,155 (77.6)	5570 (69.5)	11,011 (71.1)	643 (56.8)	255 (54.3)
Δ Strength +0.5	-	294 (3.7)	10 (0.1)	7 (0.6)	1 (0.2)
Δ Strength +1.0	440 (2.6)	182 (2.3)	105 (0.7)	7 (0.6)	-
Δ Strength +1.5	670 (4.0)	59 (0.7)	65 (0.4)	3 (0.3)	-
Δ Strength +2.0	2686 (15.9)	1621 (2.0)	112 (0.7)	-	-
Total	16,951 (100.0)	8020 (100.0)	15,480 (100.0)	1132 (100.0)	470 (100.0)
Starting Phos ≥ 6.5 mg/dL					
Δ Strength -2.0	-	-	4773 (24.8)	406 (22.2)	344 (43.8)
Δ Strength -1.5	-	1024 (12.8)	31 (0.2)	125 (6.8)	4 (0.5)
Δ Strength -1.0	-	704 (8.8)	152 (0.8)	137 (7.5)	13 (1.7)
Δ Strength -0.5	-	34 (0.4)	115 (0.6)	7 (0.4)	7 (0.9)
Δ Strength 0.0	16,256 (79.4)	5377 (67.2)	13,637 (70.9)	1098 (60.0)	-
Δ Strength +0.5	-	292 (3.7)	18 (0.1)	29 (1.6)	3 (0.4)
Δ Strength +1.0	411 (2.0)	241 (3.0)	167 (0.9)	18 (1.0)	1 (0.1)
Δ Strength +1.5	613 (3.0)	90 (1.1)	142 (0.7)	5 (0.3)	-
Δ Strength +2.0	3188 (15.6)	237 (3.0)	206 (1.1)	5 (0.3)	-
Total	20,468 (100.0)	7999 (100.0)	19,241 (100.0)	1830 (100.0)	786 (100.0)

Table S3: Transition Matrix: Probability of Death by Ending Binder Strength and Starting Serum Phosphorus Concentration

	Ending Binder Strength					Overall
	0	1/1.5	2/2.5	3/3.5	4+	
Starting Phos < 3.5 mg/dL	0.007	0.002	0.002	0.002	0.005	0.004
Starting Phos 3.5-5.5 mg/dL	0.004	0.002	0.002	0.003	0.002	0.003
Starting Phos 5.6-6.5 mg/dL	0.006	0.004	0.003	0.001	0.000	0.004
Starting Phos ≥ 6.5 mg/dL	0.007	0.004	0.004	0.004	0.002	0.005
Overall	0.005	0.002	0.002	0.003	0.002	0.003

Table S4: Input Variable Distributions

Variable	Distribution
Baseline serum phosphorus	$N(5.45, 1.64^2)$
Change in serum phosphorus (patients with serum phos <3.5, binder strength = 0)	$N(0.978, 1.23^2)$
Change in serum phosphorus (patients with serum phos <3.5, binder strength = 1)	$N(0.88, 1.13^2)$
Change in serum phosphorus (patients with serum phos <3.5, binder strength = 2)	$N(0.992, 1.24^2)$
Change in serum phosphorus (patients with serum phos <3.5, binder strength = 3)	$N(1.05, 1.26^2)$
Change in serum phosphorus (patients with serum phos <3.5, binder strength = 4)	$N(1.40, 1.73^2)$
Change in serum phosphorus (patients with serum phos 3.5 to 5.5, binder strength = 0)	$N(0.23, 1.13^2)$
Change in serum phosphorus (patients with serum phos 3.5 to 5.5, binder strength = 1)	$N(0.11, 1.06^2)$
Change in serum phosphorus (patients with serum phos 3.5 to 5.5, binder strength = 2)	$N(0.23, 1.14^2)$
Change in serum phosphorus (patients with serum phos 3.5 to 5.5, binder strength = 3)	$N(0.34, 1.29^2)$
Change in serum phosphorus (patients with serum phos 3.5 to 5.5, binder strength = 4)	$N(0.39, 1.31^2)$
Change in serum phosphorus (patients with serum phos >5.5 to ≤6.5, binder strength = 0)	$N(-0.34, 1.36^2)$
Change in serum phosphorus (patients with serum phos >5.5 to ≤6.5, binder strength = 1)	$N(-0.54, 1.35^2)$
Change in serum phosphorus (patients with serum phos >5.5 to ≤6.5, binder strength = 2)	$N(-0.37, 1.35^2)$
Change in serum phosphorus (patients with serum phos >5.5 to ≤6.5, binder strength = 3)	$N(-0.31, 1.42^2)$
Change in serum phosphorus (patients with serum phos >5.5 to ≤6.5, binder strength = 4)	$N(-0.10, 1.44^2)$
Change in serum phosphorus (patients with serum phos >6.5, binder strength = 0)	$N(-1.08, 1.78^2)$
Change in serum phosphorus (patients with serum phos >6.5, binder strength = 1)	$N(-1.25, 1.76^2)$
Change in serum phosphorus (patients with serum phos >6.5, binder strength = 2)	$N(-1.14, 1.77^2)$
Change in serum phosphorus (patients with serum phos >6.5, binder strength = 3)	$N(-1.09, 1.92^2)$
Change in serum phosphorus (patients with serum phos >6.5, binder strength = 4)	$N(-1.07, 1.96^2)$
ESA dose (patients with serum phos <3.5, binder strength = 0)	$\exp\{N(10.4, 0.98^2)\}$
ESA dose (patients with serum phos <3.5, binder strength = 1)	$\exp\{N(10.3, 0.96^2)\}$
ESA dose (patients with serum phos <3.5, binder strength = 2)	$\exp\{N(10.4, 0.97^2)\}$
ESA dose (patients with serum phos <3.5, binder strength = 3)	$\exp\{N(10.4, 0.96^2)\}$
ESA dose (patients with serum phos <3.5, binder strength = 4)	$\exp\{N(10.5, 0.90^2)\}$
ESA dose (patients with serum phos 3.5 to 5.5, binder strength = 0)	$\exp\{N(10.3, 0.95^2)\}$
ESA dose (patients with serum phos 3.5 to 5.5, binder strength = 1)	$\exp\{N(10.2, 0.93^2)\}$
ESA dose (patients with serum phos 3.5 to 5.5, binder strength = 2)	$\exp\{N(10.3, 0.95^2)\}$
ESA dose (patients with serum phos 3.5 to 5.5, binder strength = 3)	$\exp\{N(10.3, 0.93^2)\}$
ESA dose (patients with serum phos 3.5 to 5.5, binder strength = 4)	$\exp\{N(10.5, 0.96^2)\}$
ESA dose (patients with serum phos >5.5 to ≤6.5, binder strength = 0)	$\exp\{N(10.3, 0.95^2)\}$
ESA dose (patients with serum phos >5.5 to ≤6.5, binder strength = 1)	$\exp\{N(10.3, 0.95^2)\}$
ESA dose (patients with serum phos >5.5 to ≤6.5, binder strength = 2)	$\exp\{N(10.3, 0.96^2)\}$
ESA dose (patients with serum phos >5.5 to ≤6.5, binder strength = 3)	$\exp\{N(10.4, 0.97^2)\}$
ESA dose (patients with serum phos >5.5 to ≤6.5, binder strength = 4)	$\exp\{N(10.5, 0.97^2)\}$
ESA dose (patients with serum phos >6.5, binder strength = 0)	$\exp\{N(10.4, 0.97^2)\}$
ESA dose (patients with serum phos >6.5, binder strength = 1)	$\exp\{N(10.4, 0.96^2)\}$
ESA dose (patients with serum phos >6.5, binder strength = 2)	$\exp\{N(10.4, 0.98^2)\}$
ESA dose (patients with serum phos >6.5, binder strength = 3)	$\exp\{N(10.4, 0.94^2)\}$
ESA dose (patients with serum phos >6.5, binder strength = 4)	$\exp\{N(10.6, 0.98^2)\}$
Iron dose (patients with serum phos <3.5, binder strength = 0)	$\exp\{N(5.21, 0.58^2)\}$
Iron dose (patients with serum phos <3.5, binder strength = 1)	$\exp\{N(5.22, 0.58^2)\}$
Iron dose (patients with serum phos <3.5, binder strength = 2)	$\exp\{N(5.21, 0.57^2)\}$
Iron dose (patients with serum phos <3.5, binder strength = 3)	$\exp\{N(5.24, 0.61^2)\}$
Iron dose (patients with serum phos <3.5, binder strength = 4)	$\exp\{N(5.25, 0.57^2)\}$
Iron dose (patients with serum phos 3.5 to 5.5, binder strength = 0)	$\exp\{N(5.21, 0.56^2)\}$
Iron dose (patients with serum phos 3.5 to 5.5, binder strength = 1)	$\exp\{N(5.22, 0.55^2)\}$
Iron dose (patients with serum phos 3.5 to 5.5, binder strength = 2)	$\exp\{N(5.22, 0.55^2)\}$
Iron dose (patients with serum phos 3.5 to 5.5, binder strength = 3)	$\exp\{N(5.19, 0.55^2)\}$
Iron dose (patients with serum phos 3.5 to 5.5, binder strength = 4)	$\exp\{N(5.24, 0.55^2)\}$
Iron dose (patients with serum phos >5.5 to ≤6.5, binder strength = 0)	$\exp\{N(5.23, 0.56^2)\}$
Iron dose (patients with serum phos >5.5 to ≤6.5, binder strength = 1)	$\exp\{N(5.22, 0.56^2)\}$

Variable	Distribution
Iron dose (patients with serum phos >5.5 to ≤6.5, binder strength = 2)	$\exp\{N(5.24, 0.55^2)\}$
Iron dose (patients with serum phos >5.5 to ≤6.5, binder strength = 3)	$\exp\{N(5.23, 0.55^2)\}$
Iron dose (patients with serum phos >5.5 to ≤6.5, binder strength = 4)	$\exp\{N(5.18, 0.55^2)\}$
Iron dose (patients with serum phos >6.5, binder strength = 0)	$\exp\{N(5.22, 0.57^2)\}$
Iron dose (patients with serum phos >6.5, binder strength = 1)	$\exp\{N(5.23, 0.56^2)\}$
Iron dose (patients with serum phos >6.5, binder strength = 2)	$\exp\{N(5.24, 0.58^2)\}$
Iron dose (patients with serum phos >6.5, binder strength = 3)	$\exp\{N(5.25, 0.57^2)\}$
Iron dose (patients with serum phos >6.5, binder strength = 4)	$\exp\{N(5.24, 0.55^2)\}$