

Drugs - Real World Outcomes

Impact of Intravenous Iron Replacement Therapy on Health Care Costs in Patients with Iron Deficiency Anemia in the United States: A Retrospective Analysis

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SUPPLEMENTAL METHODS

Diagnostic and Procedure Codes For Iron Deficiency Anemia

Code	Code Type	Description
280.0	ICD-9 Dx	Iron deficiency anemia secondary to blood loss (chronic)
280.1	ICD-9 Dx	Iron deficiency anemia secondary to inadequate dietary iron intake
280.8	ICD-9 Dx	Other specified iron deficiency anemias
280.9	ICD-9 Dx	Unspecified iron deficiency anemia
D500	ICD-10 Dx	Iron deficiency anemia secondary to blood loss (chronic)
D501	ICD-10 Dx	Sideropenic dysphagia
D508	ICD-10 Dx	Other iron deficiency anemias
D509	ICD-10 Dx	Iron deficiency anemia, unspecified

SUPPLEMENTAL TABLES

Supplemental Table 1. Baseline and Follow-Up HCRU for Patients With Cancer

Supplemental Table 2: Baseline and Follow-Up HCRU for Patients With Cancer										
Patients With Cancer (N=10,763)										
	FCM (n=5,892)		Low-dose iron (n=4,871)		Iron sucrose (n=3,040)		FCM vs. low-dose iron <i>P</i> value ^a		FCM vs. iron sucrose <i>P</i> value ^a	
6-month baseline period										
All-cause HCRU										
	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	P value (n, %)	P value (mean, SD)	P value (n, %)	p value (mean, SD)
Inpatient stays	2,283 (38.75)	0.56 (0.87)	2,011 (41.29)	0.63 (1.03)	1,279 (42.07)	0.65 (1.09)	0.007	<0.001	0.002	<0.001
Inpatient days	4.67 (10.63)	--	5.83 (13.53)	--	6.05 (14.14)	--	<0.001	--	<0.001	--
ED visits	2,942 (49.93)	1.19 (2.09)	2,702 (55.47)	1.49 (2.54)	1,677 (55.16)	1.51 (2.41)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	5,888 (99.93)	31.84 (22.41)	4,850 (99.57)	29.40 (22.75)	3,023 (99.44)	29.76 (23.34)	<0.001	<0.001	<0.001	<0.001
12-month follow-up period										
All-cause HCRU										
	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	P value (n, %)	P value (mean, SD)	P value (n, %)	p value (mean, SD)
Inpatient stays	2,968 (50.37)	0.90 (1.28)	2,784 (57.15)	1.13 (1.46)	1,831 (60.23)	1.21 (1.49)	<0.001	<0.001	<0.001	<0.001

Inpatient days	9.27 (19.16)	--	12.79 (23.66)	--	13.68 (24.73)	--	<0.001	--	<0.001	--
ED visits	3,652 (61.98)	2.05 (3.49)	3,377 (69.33)	2.82 (4.90)	2,167 (71.28)	2.93 (4.92)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	5,888 (99.93)	57.94 (39.57)	4,854 (99.65)	59.24 (41.52)	3,029 (99.64)	61.28 (42.50)	0.001	0.099	0.001	<0.001

IDA-related HCRU,^b

	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	P value (n, %)	P value (mean, SD)	P value (n, %)	p value (mean, SD)
Inpatient stays	1,069 (18.14)	0.23 (0.57)	1,351 (27.74)	0.38 (0.72)	907 (29.84)	0.41 (0.74)	<0.001	<0.001	<0.001	<0.001
Inpatient days	3.03 (11.28)	--	5.46 (15.69)	--	6.08 (16.87)	--	<0.001	--	<0.001	--
ED visits	321 (5.45)	0.12 (0.65)	893 (18.33)	0.42 (1.23)	570 (18.75)	0.43 (1.25)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	5,882 (99.83)	8.44 (9.50)	4,626 (94.97)	10.04 (12.79)	2,874 (94.54)	10.76 (13.69)	<0.001	<0.001	<0.001	<0.001

ED, emergency department; FCM, ferric carboxymaltose; HCRU, health care resource utilization; IDA, iron deficiency anemia; SD, standard deviation.

^aP values are based on Pearson chi-square tests for binary measures and 2-sample *t* tests for continuous measures.

^bHCRU was defined as iron deficiency anemia–related if the claim had a diagnosis for iron deficiency anemia in any position on the claim or was a medical claim for intravenous iron therapy.

Supplemental Table 2. Baseline and Follow-Up HCRU for Patients With HF

Supplemental Table 2: Baseline and Follow-Up HCRU for Patients With HF										
Patients With HF (N=8,337)										
FCM (n=3,364)			Low-dose iron (n=4,973)		Iron sucrose (n=3,471)		FCM vs. low-dose iron <i>P</i> value ^a		FCM vs. iron sucrose <i>P</i> value ^a	
6-month baseline period										
All-cause HCRU										
	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	p value (n, %)	p value (mean, SD)	p value (n, %)	p value (mean, SD)
Inpatient stays	1,745 (51.87)	0.83 (1.05)	2,776 (55.82)	0.95 (1.22)	1,961 (56.50)	0.96 (1.24)	<0.001	<0.001	<0.001	<0.001
Inpatient days	7.99 (15.05)	--	10.17 (19.90)	--	10.27 (20.37)	--	<0.001		<0.001	
ED visits	2,191 (65.13)	1.88 (2.72)	3,601 (72.41)	2.50 (3.55)	2,495 (71.88)	2.39 (3.06)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	3,362 (99.94)	33.56 (22.36)	4,915 (98.83)	30.03 (22.97)	3,424 (98.65)	29.86 (22.76)	<0.001	<0.001	<0.001	<0.001
12-month follow-up period										
All-cause HCRU										
	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	p value (n, %)	p value (mean, SD)	p value (n, %)	p value (mean, SD)
Inpatient stays	2,156 (64.09)	1.33 (1.58)	3,514 (70.66)	1.61 (1.73)	2,510 (72.31)	1.64 (1.71)	<0.001	<0.001	<0.001	<0.001
Inpatient days	15.31 (25.12)	--	20.63 (31.46)	--	21.24 (31.84)	--	<0.001	--	<0.001	--

ED visits	2,526 (75.09)	3.23 (4.92)	4,233 (85.12)	4.42 (6.38)	2,974 (85.68)	4.34 (6.26)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	3,359 (99.85)	62.33 (42.62)	4,939 (9.32)	61.51 (46.55)	3,441 (99.14)	62.26 (47.25)	<0.001	0.409	<0.001	0.951

IDA-related HCRU,^b

	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	p value (n, %)	p value (mean, SD)	p value (n, %)	p value (mean, SD)
Inpatient stays	944 (28.06)	0.40 (0.78)	1,999 (40.20)	0.61 (0.93)	1,444 (41.60)	0.62 (0.93)	<0.001	<0.001	<0.001	<0.001
Inpatient days	6.06 (16.66)	--	9.71 (21.34)	--	10.06 (21.54)	--	<0.001		<0.001	
ED visits	295 (8.77)	0.22 (0.90)	1,466 (29.48)	0.73 (1.62)	967 (27.86)	0.67 (1.52)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	3,351 (99.61)	9.62 (12.68)	4,434 (89.16)	10.74 (17.12)	3,075 (88.59)	10.74 (17.44)	<0.001	<0.001	<0.001	0.002

ED, emergency department; FCM, ferric carboxymaltose; HCRU, health care resource utilization; HF, heart failure; IDA, iron deficiency anemia; SD, standard deviation.

^aP values are based on Pearson chi-square tests for binary measures and 2-sample *t* tests for continuous measures.

^bHCRU was defined as iron deficiency anemia–related if the claim had a diagnosis for iron deficiency anemia in any position on the claim or was a medical claim for intravenous iron therapy.

Supplemental Table 3. Baseline and Follow-Up HCRU for Patients With CKD

Patients With CKD (N=10,617)										
	FCM (n=4,377)		Low-dose iron (n=6,240)		Iron sucrose (n=4,584)		FCM vs. low-dose iron <i>P</i> value ^a		FCM vs. iron sucrose <i>P</i> value ^a	
6-month baseline period										
All-cause HCRU										
	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	p value (n, %)	p value (mean, SD)	p value (n, %)	p value (mean, SD)
Inpatient stays	1,735 (39.64)	0.59 (0.91)	2,803 (44.92)	0.74 (1.12)	2,048 (44.68)	0.73 (1.13)	<0.001	<0.001	<0.001	<0.001
Inpatient days	--	5.50 (12.70)	--	7.84 (17.86)	--	7.81 (18.19)	<0.001	--	<0.001	--
ED visits	2,306 (52.68)	1.37 (2.37)	3,873 (62.07)	1.92 (3.16)	2,769 (60.41)	1.83 (2.84)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	4,376 (99.98)	29.53 (21.35)	6,196 (99.29)	27.48 (22.21)	4,548 (99.21)	27.23 (22.14)	<0.001	<0.001	<0.001	<0.001
12-month follow-up period										
All-cause HCRU										
	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	p value (n, %)	p value (mean, SD)	p value (n, %)	p value (mean, SD)
Inpatient stays	2,236 (51.09)	1.00 (1.46)	3,650 (58.49)	1.26 (1.65)	2,693 (58.75)	1.26 (1.66)	<0.001	<0.001	<0.001	<0.001
Inpatient days	--	10.95 (21.71)	--	15.77 (27.95)	--	15.67 (27.90)	<0.001	--	<0.001	--

ED visits	2,828 (64.61)	2.42 (4.51)	4,659 (74.66)	3.47 (5.77)	3,386 (73.87)	3.36 (5.62)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	4,372 (99.89)	56.52 (41.11)	6,206 (99.46)	58.15 (45.81)	4,558 (99.43)	58.52 (46.19)	0.055	<0.001	0.030	<0.001

IDA-related HCRU,^b

	n (%)	mean (SD)	n (%)	mean (SD)	n (%)	mean (SD)	p value (n, %)	p value (mean, SD)	p value (n, %)	p value (mean, SD)
Inpatient stays	962 (21.98)	0.31 (0.71)	1,917 (30.72)	0.44 (0.81)	1,404 (30.63)	0.44 (0.82)	<0.001	<0.001	<0.001	<0.001
Inpatient days	--	4.48 (14.64)	--	7.20 (18.94)	--	7.24 (19.12)	<0.001	--	<0.001	--
ED visits	328 (7.49)	0.17 (0.79)	1,388 (22.24)	0.52 (1.39)	910 (19.85)	0.46 (1.28)	<0.001	<0.001	<0.001	<0.001
Ambulatory care visits	4,363 (99.68)	8.96 (12.19)	5,739 (91.97)	10.21 (16.42)	4,234 (92.36)	10.31 (16.61)	<0.001	<0.001	<0.001	<0.001

CKD, chronic kidney disease; ED, emergency department; FCM, ferric carboxymaltose; HCRU, health care resource utilization; IDA, iron deficiency anemia; SD, standard deviation.

^aP values are based on Pearson chi-square tests for binary measures and 2-sample *t*-tests for continuous measures.

^bHCRU was defined as iron deficiency anemia–related if the claim had a diagnosis for iron deficiency anemia in any position on the claim or was a medical claim for intravenous iron therapy.

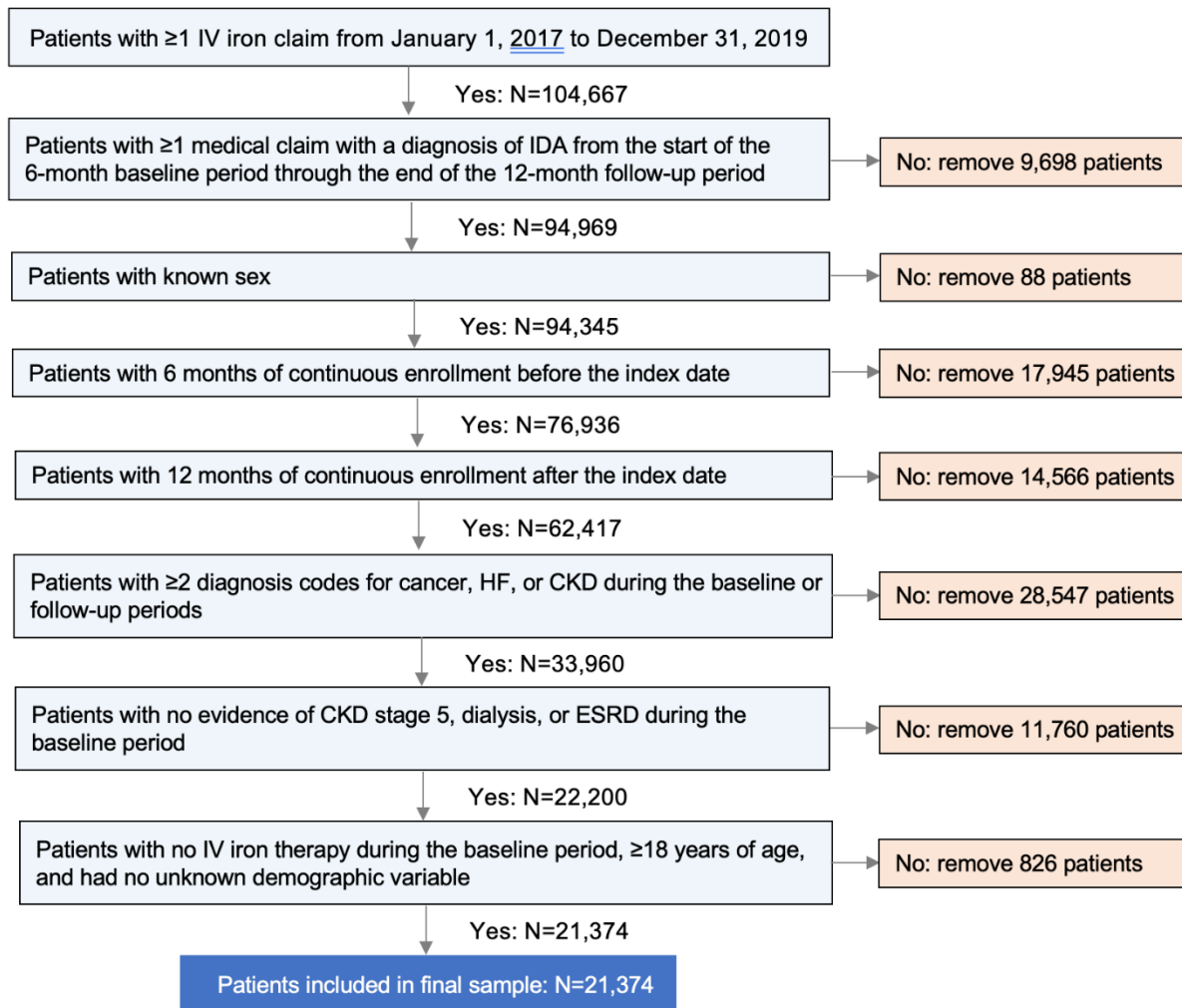
Supplemental Table 4. Baseline follow-up period IDA-related treatment patterns

	Cancer population (n=10,763)			HF population (n=8,337)			CKD population (n=10,617)		
	FCM	Low dose	Iron sucrose	FCM	Low dose	Iron sucrose	FCM	Low dose	Iron sucrose
Baseline									
Blood transfusion, n (%)	21.2	24.9**	24.6**	27.3	29.3*	27.9	21.1	23.4*	22.1
Days with transfusion, mean (SD)	11.3 (17.5)	11.6 (16.2)	11.9 (15.7)	13.6 (16.6)	13.6 (17.3)	13.2 (17.4)	12.3 (15.5)	12.9 (17.8)	12.4 (16.9)
Follow-up									
Blood transfusion, n (%)	22.2	32.4**	34.2**	27.0	36.6**	36.3**	22.9	30.7**	29.6**
Days with transfusion, mean (SD)	15.5 (23.2)	18.5 (26.2)	19.0 (27.8)	20.1 (29.2)	21.9 (32.3)	22.8 (35.3)	18.9 (29.4)	21.5 (32.0)*	22.3 (34.9)*
IDA-related Hospitalizations (%)	18.1	27.7**	29.8**	28.1	40.2**	42.6**	22.0	30.7**	30.6**

*P<0.05 vs. FCM; **P<0.001 vs. FCM

SUPPLEMENTAL FIGURE

Supplemental Figure 1. Sample Identification



CKD, chronic kidney disease; ESRD, end-stage renal disease; HF, heart failure; IDA, iron deficiency anemia; IV, intravenous.