

**ANALYSIS OF INTERMEDIATE OUTCOMES FOR ADULT HISPANIC IN-CENTER HEMODIALYSIS PATIENTS: RESULTS FROM THE 2002 END-STAGE RENAL DISEASE (ESRD) CLINICAL PERFORMANCE MEASURES (CPM) PROJECT**

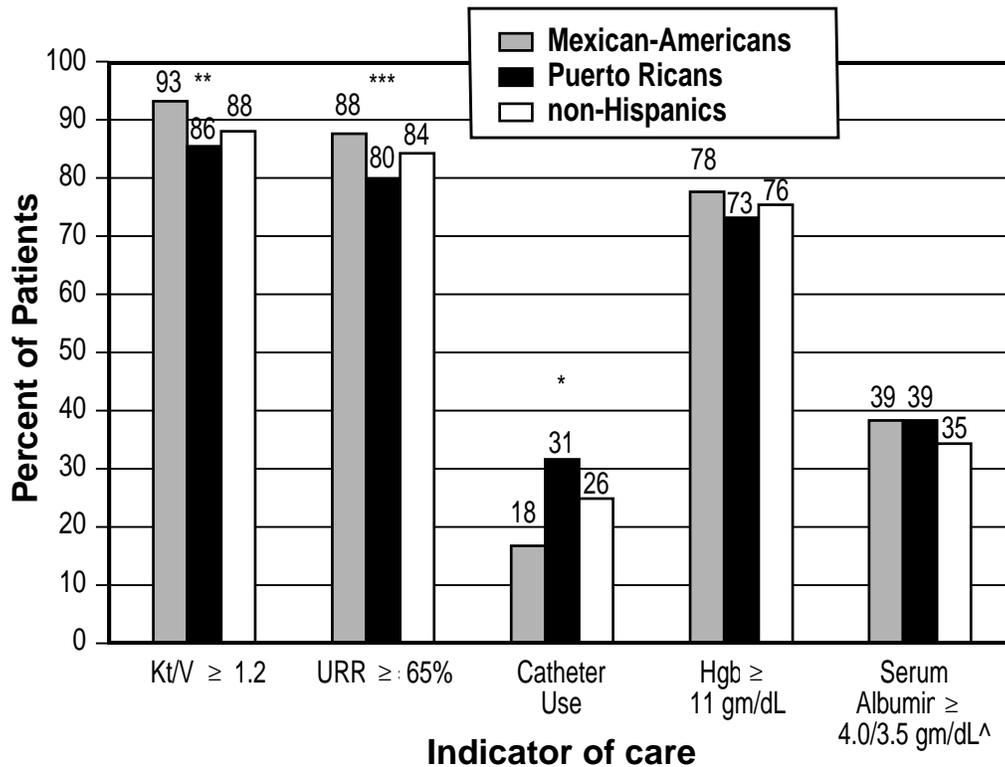
**Supplemental Report #2**

**March 2003**

2002 ESRD Clinical Performance Measures Project

**Department of Health and Human Services**

The Centers for Medicare & Medicaid Services



<sup>^</sup> BCG/BCP – bromcresol green/bromcresol purple laboratory methods

Significant differences among ethnic groups noted by: \*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.05$

**INTRODUCTION**

The purpose of the End-Stage Renal Disease (ESRD) Clinical Performance Measures (CPM) Project is to assist providers of ESRD services in the assessment of care provided to their patients and to stimulate improvement in that care. One of the goals of the federal government’s initiative *Healthy People 2010* is to eliminate health disparities among different segments of the population.<sup>1</sup> The ESRD CPM Project has been providing information on intermediate outcomes of care for Hispanics since the 1999 study year to monitor the quality of dialytic care provided to this segment of the ESRD population. In 2002, for the first time, we collected information on particular sub-groups within the Hispanic category: 1) Hispanic, Mexican-American (or Chicano); 2) Hispanic, Puerto Rican; 3) Hispanic, Cuban-American; and 4) Hispanic, Other.

This report provides the results from the ethnic analysis of demographic characteristics and selected intermediate outcomes of dialytic care for selected sub-groups of Hispanic ethnicity. Results are presented comparing the Hispanic group to non-Hispanics, and separately, comparing Hispanic, Mexican-Americans and Hispanic, Puerto Ricans to non-Hispanics. Results for the sub-group Hispanic, Cuban-American are not presented in this report as there were too few patients in this sub-group in the sample for analysis. Results for the category Hispanic, Other are not presented in this report due to the possible heterogeneity of ethnic mixtures within this sub-group.

## METHODS

A random sample was drawn of adult in-center hemodialysis (HD) patients (aged  $\geq 18$  years), stratified by ESRD Network, identified by the 18 ESRD Networks as alive and receiving HD on December 31, 2001.

### Data Collection

During May 2002, a three-page HD data collection form was sent to each facility that had one or more selected HD patients aged  $\geq 18$  years dialyzing at that facility. Staff at the facility abstracted clinical information from the medical record for each patient who was receiving in-center HD during the months of October, November, and December 2001. Patient characteristic information collected included gender, age, race, Hispanic ethnicity, years on dialysis, primary cause of ESRD, and the presence of amputation(s). Categories for Hispanic ethnicity provided on the data collection form included: 1) non-Hispanic; 2) Hispanic, Mexican-American or Chicano; 3) Hispanic, Puerto Rican; 4) Hispanic, Cuban-American; and 5) Hispanic, Other. Facility staff were instructed to verify the patient's ethnicity before entering the information on the data collection form.

Clinical information used to assess the quality of care provided to these patients included the following: patient height and pre- and post-dialysis weight, pre- and post-dialysis blood urea nitrogen (BUN) values and dialysis session length to calculate Kt/V values, dialyzer KUF values, type of vascular access, blood pump flow rates, hemoglobin (Hgb) values, prescribed Epoetin alfa dose and route of administration, iron use and route of administration, transferrin saturation (TSAT) values, serum ferritin concentrations, serum albumin values and the laboratory method used to determine them (bromocresol green [BCG] or bromocresol purple [BCP]).

Completed forms were returned to the appropriate Network office where data were reviewed and entered into a computerized database (Visual FoxPro). The data were aggregated by The Renal Network, Inc. and forwarded to the Centers for Medicare & Medicaid Services (CMS) for analysis.

### Data Analysis

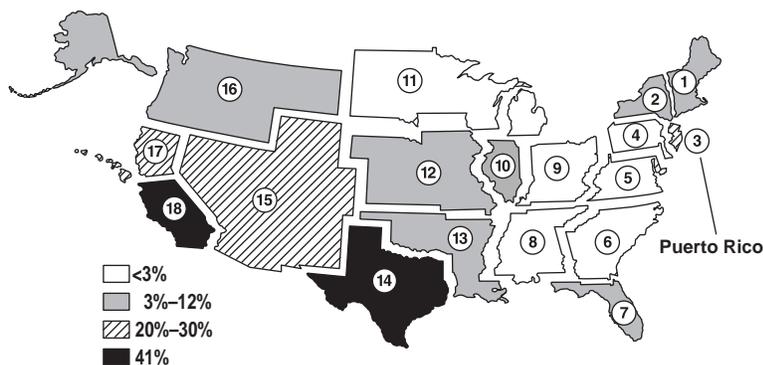
The following ethnic categories were utilized in the analyses presented in this report: Hispanics compared to non-Hispanics, and separately, within the Hispanic group: 1) Hispanic, Mexican-American (or Chicano); 2) Hispanic, Puerto Rican; and 3) non-Hispanics. For this report, all available information was used to calculate means, medians, and threshold values. Single pool Kt/V values were calculated according to the Daugirdas II formula.<sup>2</sup> Due to the small numbers of persons in racial categories other than black and white, analyses by race were limited to these two racial groups. Associations of clinical data with patient characteristics were tested by Chi square, hierarchical ANOVA, and two-tailed Student's t-test. A p-value  $< 0.05$  was considered to be significant.

The data analyses were conducted utilizing SPSS for Windows, v. 10.0.<sup>3</sup>

## RESULTS

8255/8399 (98%) patients in the sample had information regarding Hispanic ethnic status reported. 1008/8255 patients (12%) were categorized as Hispanic; 7247 (88%) as non-Hispanic. The percent of Hispanic patients ranged from 0.4% to 41% across the 18 ESRD Networks, with Networks 18 (Southern CA), 14 (TX), 3 (NJ and Puerto Rico), 15 (AZ, CO, NM, NV, UT, WY) and 17 (Northern CA, HI, Guam, and Samoa) reporting the highest percentages, 41%, 41%, 29%, 25%, and 21%, respectively (Figure 1). Within the Hispanic group, 609 (60%) were Mexican-American, 179 (18%) were Puerto Rican, 39 (4%) were Cuban-American, and 181 (18%) were categorized as Hispanic, Other.

Figure 1: Distribution of adult Hispanic in-center hemodialysis patients in the U.S.



Hispanic patients were more likely to be White, younger, and have diabetes mellitus as the cause of ESRD, all  $p$ 's  $< 0.001$  (Table 1a). Within the Hispanic group, Mexican-Americans compared to Puerto Ricans and non-Hispanics were more likely to be White (87% vs. 49% and 50%, respectively,  $p < 0.001$ ), have diabetes mellitus as the cause of ESRD (62% vs. 55% and 41%, respectively,  $p < 0.001$ ), and have dialyzed a shorter period of time (3.3 ( $\pm 3.4$ ) years vs. 4.2 ( $\pm 4.3$ ) years and 3.6 ( $\pm 4.0$ ) years, respectively,  $p < 0.05$ ) (Table 1b).

### Hispanics compared to Non-Hispanics (Table 2)

#### Adequacy of Dialysis

Hispanic patients compared to non-Hispanics were more likely to have a higher mean Kt/V over the three-month study period (1.54 [ $\pm 0.26$ ] vs. 1.49 [ $\pm 0.26$ ],  $p < 0.001$ ), and slightly more Hispanics had a mean Kt/V  $\geq 1.2$  (91% vs. 88%,  $p < 0.01$ ). Similar results were noted for mean URR and URR  $\geq 65\%$ . These outcomes were attained by Hispanics despite similar BMIs, shorter dialysis session lengths, similar blood pump flow rates, and less use of hi-flux dialyzers compared to non-Hispanics.

Table 1a: Selected patient characteristics by Hispanic ethnicity

Patient Characteristic	Hispanic (n=1008)	Non-Hispanic (n=7247)
% Male	54	53
Race		
% White*	75	50
% Black*	4	42
Age (years)		
Mean (± SD)*	59.3 (± 14.9)	61.6 (± 15.4)
Median	61.2	63.6
% 18-64 years*	60	53
% 65+*	40	47
% Primary cause of ESRD*		
Diabetes mellitus	57	41
Hypertension	16	27
Glomerulonephritis	12	11
Other/Unknown	15	21
Duration of dialysis (years)		
Mean (± SD)	3.6 (± 3.8)	3.6 (± 4.0)
Median	2.5	2.3
% with amputation(s)^	8	7
Post-dialysis BMI^^ (kg/m <sup>2</sup> )		
Mean (± SD)	26.7 (± 6.2)	26.7 (± 6.8)
Median	25.7	25.5

Note: Percents may not add up to 100% due to rounding.

Significant difference between groups noted by: \*p < 0.001

^ Amputation(s) defined as a below-knee, below-elbow, or more proximal amputation(s)

^^ BMI – body mass index

## Vascular Access

There were no significant differences in the use of either an AV fistula or an AV graft in Hispanic and non-Hispanic patients, but catheter use was lower in the Hispanic group (21% vs. 26%, p < 0.01).

## Anemia Management

There were no significant differences in attaining selected hemoglobin targets between ethnic groups. Hispanic patients were prescribed lower mean Epoetin alfa doses by either the intravenous (IV) or subcutaneous (SC) route than non-Hispanics in achieving equivalent hemoglobin targets.

Hispanics had higher mean transferrin saturation values (30.0 [± 12.2]% vs. 28.9 [± 12.3]%, p < 0.01) and more Hispanics had a mean transferrin saturation ≥ 20% compared to non-Hispanics (84% vs. 79%, p < 0.001). There were no significant differences between groups in mean serum ferritin concentration values or in having a mean serum ferritin concentration ≥ 100 ng/mL or > 800 ng/mL.

Table 1b: Selected patient characteristics, Non-Hispanics compared to Hispanics, Mexican-American and Hispanics, Puerto Rican

Patient Characteristic	Hispanic, Mexican-American (n=609)	Hispanic, Puerto Rican (n=179)	Non-Hispanic (n=7247)
% Male	51	60	53
Race			
% White*	87	49	50
% Black	+	+	42
Age (years)			
Mean (± SD)**	59.7 (± 15.0)	60.1 (± 13.9)	61.6 (± 15.4)
Median	61.9	61.7	63.6
% 18-64 years**	59	61	53
% 65+**	42	39	47
% Primary cause of ESRD*			
Diabetes mellitus	62	55	41
Hypertension	14	16	27
Glomerulonephritis	10	16	11
Other/Unknown	14	13	21
Duration of dialysis (years)			
Mean (± SD)***	3.3 (± 3.4)	4.2 (± 4.3)	3.6 (± 4.0)
Median	2.3	2.8	2.3
% with amputation(s)^	9	7	7
Post-dialysis BMI^^ (kg/m <sup>2</sup> )			
Mean (± SD)	26.7 (± 6.2)	26.3 (± 6.5)	26.7 (± 6.8)
Median	25.8	25.2	25.5

Note: Percents may not add up to 100% due to rounding.

Significant difference among ethnic groups noted by: \*p < 0.001; \*\* p < 0.01; \*\*\* p < 0.05

+ Value suppressed because n < 11

^ Amputation(s) defined as a below-knee, below-elbow, or more proximal amputation(s)

^^ BMI – body mass index

Iron prescription patterns were similar for both ethnic groups, with approximately two-thirds of patients prescribed iron at least once during the study period.

## Serum Albumin

Hispanic patients were more likely to have higher mean serum albumin values by either the BCG or the BCP laboratory method compared to non-Hispanics, and more Hispanics compared to non-Hispanics achieved a mean serum albumin ≥ 4.0/3.7 gm/dL (BCG/BCP) (40% vs. 35%, p < 0.01). These outcomes were attained by Hispanics despite the higher

percentage of diabetic patients in the Hispanic group. The younger mean age of Hispanic patients may have also contributed to the higher level of serum albumin levels in these patients.

### **Within the Hispanic Ethnic Group (Table 3)**

#### **Adequacy of Dialysis**

Mexican-Americans were more likely to have higher mean Kt/V values compared to Puerto Ricans and non-Hispanics (1.58 [± 0.26] vs. 1.48 [± 0.27] and 1.49 [± 0.26], respectively,  $p < 0.001$ ), and a larger percentage of Mexican-Americans attained a mean Kt/V  $\geq 1.2$  compared to Puerto Ricans and non-Hispanics over the study period (93% vs. 86% and 88%, respectively,  $p < 0.01$ ). Similar results were seen for mean URR and URR  $\geq 65\%$ . Blood pump flow rates and BMIs were similar across ethnic groups, but Mexican-Americans had shorter dialysis session lengths ( $p < 0.001$ ) and a significantly smaller percentage of Puerto Ricans were dialyzed with a hi-flux dialyzer (defined for this report as KUF  $\geq 20$  mL/mmHg/hr) ( $p < 0.001$ ).

#### **Vascular Access**

AV fistula use was similar across groups. Mexican-Americans were more likely to have an AV graft as their access compared to Puerto Ricans and non-Hispanics (50% vs. 34% and 42%, respectively,  $p < 0.001$ ). They were also less likely to have a catheter as their access (18% vs. 31% and 26%, respectively,  $p < 0.001$ ).

#### **Anemia Management**

There were no significant differences in mean hemoglobin values across groups. Puerto Ricans were more likely to have a mean hemoglobin  $< 10$  gm/dL compared to Mexican-Americans or non-Hispanics (11% vs. 5% and 8%, respectively,  $p < 0.05$ ). There were no significant differences across groups in attaining a mean hemoglobin 11-12 gm/dL (for Epoetin alfa treated patients only),  $< 9$  gm/dL, or  $\geq 11$  gm/dL.

Mexican-Americans were less likely to have Epoetin alfa prescribed by the IV route compared to Puerto Ricans or non-Hispanics (87% vs. 96% and 91%, respectively,  $p < 0.01$ ). Mean weekly IV Epoetin alfa doses were significantly lower for Mexican-Americans compared to Puerto Ricans and non-Hispanics (228.4 (± 183.4) units/kg/week vs. 266.2 (± 210.6) units/kg/week and 256.5 (± 232.5) units/kg/week, respectively,  $p < 0.05$ ).

A higher percentage of Mexican-Americans had a mean transferrin saturation  $\geq 20\%$  compared to Puerto Ricans or non-Hispanics (84% vs. 82% and 79%, respectively,  $p < 0.01$ ). There were no significant differences across ethnic categories in mean serum ferritin concentration values or in having a mean serum ferritin concentration  $\geq 100$  ng/mL or  $> 800$  ng/mL.

Iron prescription practices were similar across groups, with approximately two-thirds of patients in each ethnic group prescribed iron at least once during the study period.

#### **Serum Albumin**

There were no significant differences in mean serum albumin values by either the BCG or the BCP laboratory methods across ethnic categories, nor in attaining a mean serum albumin  $\geq 4.0/3.7$  gm/dL (BCG/BCP) or  $\geq 3.5/3.2$  gm/dL (BCG/BCP).

#### **KEY OBSERVATIONS**

- Hispanic patients were more likely to be White, younger, and have diabetes mellitus as the cause of ESRD compared to non-Hispanics. The mean duration of dialysis, percent of patients with amputations and the mean BMI were similar for Hispanics and non-Hispanics.
- Mexican-Americans were more likely to be White, younger, have diabetes mellitus as the cause of ESRD and have dialyzed fewer years compared to Puerto Ricans or non-Hispanics. The percent of patients with amputations and the mean BMI were similar across groups.
- Hispanic patients had equivalent or better intermediate outcomes compared to non-Hispanics for adequacy of dialysis, vascular access indicators, anemia management and serum albumin.
- Mexican-Americans experienced equivalent or better intermediate outcomes compared to Puerto Ricans and non-Hispanics for adequacy of dialysis, vascular access indicators, anemia management and serum albumin.
- Puerto Ricans were more likely to have a catheter as their vascular access compared to Mexican-Americans and non-Hispanics, and fewer Puerto Ricans met dialysis adequacy or anemia management thresholds compared to the other two ethnic groups. These results should be interpreted with caution due to the small number of Puerto Ricans in this sample.

#### **NEXT STEPS**

Further analysis will be conducted to more completely understand the associations of these intermediate outcomes of care by Hispanic ethnic category.

#### **REFERENCES**

1. U.S. Department of Health and Human Services, *Healthy People 2010: Understanding and Improving Health*. 2<sup>nd</sup> Ed. Washington, DC, U.S. Government Printing Office, November 2000.
2. Daugirdas JT. Second generation logarithmic estimates of single-pool variable volume Kt/V: an analysis of error. *J Am Soc Nephrol* 1993;4:1205-1213.
3. Norusis MJ. *SPSS for Windows Advanced Statistics*. Release 10.0. Chicago, IL. 1999.

Table 2: Selected intermediate outcomes by Hispanic ethnicity

Clinical Measure <sup>a</sup>	Hispanic (n=1008)	Non-Hispanic (n=7247)	Clinical Measure <sup>a</sup>	Hispanic (n=1008)	Non-Hispanic (n=7247)
<b>Clearance</b>			Weekly Epoetin alfa dose (units/kg/week)		
Kt/V			IV		
Mean (± SD)*	1.54 (± 0.26)	1.49 (± 0.26)	Mean (± SD)***	237.6 (± 194.8)	256.5 (± 232.5)
Median	1.54	1.49	Median	181.6	199.1
Mean Kt/V ≥ 1.2**	906 (91)	6299 (88)	SC		
URR (%)			Mean (± SD)		
Mean (± SD)*	71.7 (± 7.1)	70.8 (± 6.8)		205.7 (± 141.4)	214.6 (± 214.1)
Median	72.5	71.5	Median		
Mean URR ≥ 65%	871 (86)	6094 (84)	Transferrin saturation (%)		
Dialysis session length (minutes)			Mean (± SD)**		
Mean (± SD)*	213.2 (± 27.0)	217.0 (± 30.1)		30.0 (± 12.2)	28.9 (± 12.3)
Median	210.0	213.0	Median		
Blood pump flow rate (mL/minute)			Mean transferrin saturation ≥ 20%*		
Mean (± SD)	392.9 (± 64.7)	397.0 (± 67.9)		818 (84)	5415 (79)
Median	400.0	400.0	Serum ferritin concentration (ng/mL)		
Dialyzed with a hi-flux dialyzer (Kuf ≥ 20 mL/mmHg/hr)*			Mean (± SD)		
	698 (76)	5052 (81)		600.6 (± 428.7)	594.2 (± 417.1)
<b>Vascular Access</b>			Median		
Type of access				514.0	529.0
AV fistula	337 (34)	2267 (32)	Mean serum ferritin concentration		
AV graft	451 (45)	3031 (42)	≥ 100 ng/mL		
Catheter**	214 (21)	1866 (26)		882 (92)	6275 (91)
Catheter in use ≥ 90 days	154 (15)	1448 (20)	Mean serum ferritin concentration		
<b>Anemia Management</b>			> 800 ng/mL		
Hemoglobin (gm/dL)			Patients with relative iron deficiency <sup>c</sup>		
Mean (± SD)	11.7 (± 1.1)	11.7 (± 1.2)		29 (3)	256 (4)
Median	11.8	11.7	Patients prescribed iron		
Mean Hgb < 9	19 (2)	171 (2)	Within this group:		
Mean Hgb < 10	69 (7)	587 (8)	Prescribed IV		
Mean Hgb 11-12.0 <sup>b</sup>	377 (39)	2677 (38)		621 (96)	4643 (95)
Mean Hgb ≥ 11	780 (77)	5512 (76)	Prescribed PO		
Patients prescribed Epoetin alfa				62 (10)	401 (8)
	970 (96)	6954 (96)	<b>Serum Albumin (gm/dL)</b>		
Within this group:			BCG <sup>d</sup>		
Prescribed IV	870 (90)	6351 (91)	Mean (± SD)**		
Prescribed SC	103 (11)	660 (10)		3.84 (± 0.40)	3.80 (± 0.41)
			Median		
				3.87	3.83
			BCP <sup>e</sup>		
			Mean (± SD)		
				3.62 (± 0.53)	3.59 (± 0.50)
			Median		
				3.63	3.60
			Mean serum albumin ≥ 4.0/3.7 gm/dL (BCG/BCP)**		
				403 (40)	2501 (35)
			Mean serum albumin ≥ 3.5/3.2 gm/dL (BCG/BCP)		
				838 (83)	5882 (81)

Significant differences between groups noted by: \* p < 0.001; \*\* p < 0.01; \*\*\* p < 0.05

<sup>a</sup> Continuous variables displayed as the mean (± SD) and median values; categorical variables displayed as number and percent of available values

<sup>b</sup> Among patients prescribed Epoetin alfa

<sup>c</sup> Relative iron deficiency defined for this report as a mean transferrin saturation < 20% and a mean serum ferritin concentration < 100 ng/mL

<sup>d</sup> BCG – bromocresol green laboratory method

<sup>e</sup> BCP – bromocresol purple laboratory method

Table 3: Selected intermediate outcomes, Non-Hispanics compared to Hispanics, Mexican-American and Hispanics, Puerto Rican

Clinical Measure <sup>a</sup>	Hispanic, Mexican-American (n=609)	Hispanic, Puerto Rican (n=179)	Non-Hispanic (n=7247)	Clinical Measure <sup>a</sup>	Hispanic, Mexican-American (n=609)	Hispanic, Puerto Rican (n=179)	Non-Hispanic (n=7247)
<b>Clearance</b>				Weekly Epoetin alfa dose (units/kg/week)			
Kt/V				IV			
Mean (± SD)*	1.58 (± 0.26)	1.48 (± 0.27)	1.49 (± 0.26)	Mean (± SD)***	228.4 (± 183.4)	266.2 (± 210.6)	256.5 (± 232.5)
Median	1.58	1.47	1.49	Median	181.6	212.0	199.1
Mean Kt/V ≥ 1.2**	561 (93)	152 (86)	6299 (88)	SC			
				Mean (± SD)	196.6 (± 140.0)	+	214.6 (± 214.1)
				Median	161.1	+	160.8
URR (%)				Transferrin saturation (%)			
Mean (± SD)*	72.5 (± 7.0)	69.9 (± 7.7)	70.8 (± 6.7)	Mean (± SD)	29.7 (± 11.8)	29.2 (± 12.3)	28.9 (± 12.3)
Median	73.5	70.9	71.5	Median	27.3	27.0	26.5
Mean URR ≥ 65%***	536 (88)	144 (80)	6094 (84)	Mean transferrin saturation ≥ 20%**			
					498 (84)	140 (82)	5415 (79)
Dialysis session length (minutes)				Serum ferritin concentration (ng/mL)			
Mean (± SD)*	211.9 (± 26.6)	218.6 (± 27.0)	217.0 (± 30.1)	Mean (± SD)	611.8 (± 421.8)	556.5 (± 461.9)	594.2 (± 417.1)
Median	210.0	225.0	213.0	Median	526.0	426.3	529.0
Blood pump flow rate (mL/minute)				Mean serum ferritin concentration ≥ 100 ng/mL			
Mean (± SD)	396.4 (± 65.8)	385.0 (± 59.9)	397.0 (± 67.9)		543 (93)	145 (88)	6275 (91)
Median	400.0	400.0	400.0	Mean serum ferritin concentration > 800 ng/mL			
Dialyzed with a hi-flux dialyzer (KUf ≥ 20 mL/mmHg/hr)*					173 (30)	40 (24)	1848 (27)
	463 (83)	80 (47)	5052 (81)	Patients with relative iron deficiency <sup>c</sup>			
					16 (3)	+	256 (4)
<b>Vascular Access</b>				Patients prescribed iron			
Type of access					395 (65)	108 (60)	4870 (67)
AV fistula	194 (32)	63 (36)	2267 (32)	Within this group:			
AV graft*	306 (50)	60 (34)	3031 (42)	Prescribed IV	379 (96)	103 (95)	4643 (95)
Catheter*	108 (18)	54 (31)	1866 (26)	Prescribed PO	33 (8)	14 (13)	401 (8)
Catheter in use ≥ 90 day	74 (12)	40 (22)	1448 (20)	<b>Serum Albumin (gm/dL)</b>			
<b>Anemia Management</b>				BCG <sup>d</sup>			
Hemoglobin (gm/dL)				Mean (± SD)	3.83 (± 0.39)	3.84 (± 0.42)	3.80 (± 0.41)
Mean (± SD)	11.7 (± 1.1)	11.7 (± 1.5)	11.7 (± 1.2)	Median	3.87	3.90	3.83
Median	11.8	11.7	11.7	BCP <sup>e</sup>			
Mean Hgb < 9	+	+	171 (2)	Mean (± SD)	3.61 (± 0.54)	+	3.59 (± 0.50)
Mean Hgb < 10***	31 (5)	19 (11)	587 (8)	Median	3.62	+	3.60
Mean Hgb 11-12.0 <sup>b</sup>	228 (39)	60 (35)	2677 (38)	Mean serum albumin ≥ 4.0/3.7 gm/dL (BCG/BCP)			
Mean Hgb ≥ 11	475 (78)	130 (73)	5512 (76)		235 (39)	69 (39)	2501 (35)
Patients prescribed Epoetin alfa				Mean serum albumin ≥ 3.5/3.2 gm/dL (BCG/BCP)			
	581 (95)	171 (96)	6954 (96)		510 (84)	146 (82)	5882 (81)
Within this group:							
Prescribed IV**	507 (87)	164 (96)	6351 (91)				
Prescribed SC	75 (13)	+	660 (10)				

Significant differences between groups noted by: \* p < 0.001; \*\* p < 0.01; \*\*\* p < 0.05

<sup>a</sup> Continuous variables displayed as the mean (± SD) and median values; categorical variables displayed as number and percent of available values

<sup>b</sup> Among patients prescribed Epoetin alfa

<sup>c</sup> Relative iron deficiency defined for this report as a mean transferrin saturation < 20% and a mean serum ferritin concentration < 100 ng/mL

<sup>d</sup> BCG – bromocresol green laboratory method <sup>e</sup> BCP – bromocresol purple laboratory method

<sup>+</sup> Value suppressed because n < 11