

2006 ANNUAL REPORT ESRD CLINICAL PERFORMANCE MEASURES PROJECT

OPPORTUNITIES
TO IMPROVE CARE FOR
IN-CENTER HEMODIALYSIS
AND PERITONEAL DIALYSIS PATIENTS

JANUARY 2007



Department of Health and Human Services
Centers for Medicare & Medicaid Services
Office of Clinical Standards & Quality
Baltimore, Maryland



Data on adult and pediatric in-center hemodialysis patients are from October–December 2005

Data on adult and pediatric peritoneal dialysis patients are from October 2005–March 2006

END STAGE RENAL DISEASE NETWORKS

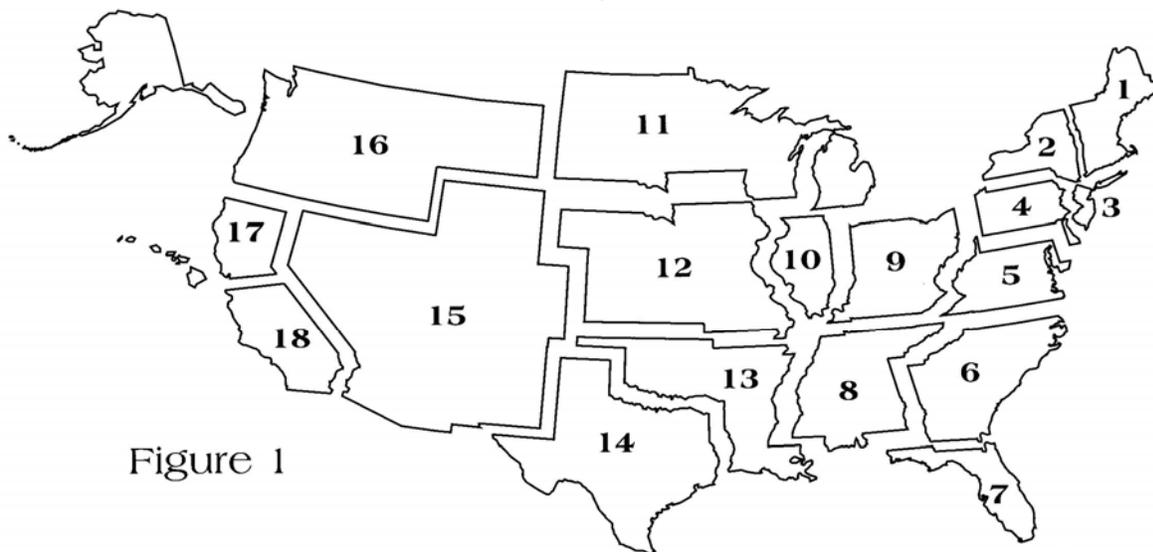


Figure 1

ESRD Network No. 1
Maine, New Hampshire, Vermont,
Massachusetts, Connecticut, Rhode Island

ESRD Network No. 2
New York State

ESRD Network No. 3
New Jersey, Puerto Rico,
U.S. Virgin Islands

ESRD Network No. 4
Pennsylvania, Delaware

ESRD Network No. 5
District of Columbia, Maryland,
Virginia, West Virginia

ESRD Network No. 6
Georgia, North Carolina, South Carolina

ESRD Network No. 7
Florida

ESRD Network No. 8
Alabama, Mississippi, Tennessee

ESRD Network No. 9
Kentucky, Indiana, Ohio

ESRD Network No. 10
Illinois

ESRD Network No. 11
Michigan, Minnesota, Wisconsin,
North Dakota, South Dakota

ESRD Network No. 12
Missouri, Iowa, Nebraska, Kansas

ESRD Network No. 13
Arkansas, Louisiana, Oklahoma

ESRD Network No. 14
Texas

ESRD Network No. 15
New Mexico, Colorado, Wyoming,
Utah, Arizona, Nevada

ESRD Network No. 16
Montana, Alaska, Idaho, Oregon,
Washington

ESRD Network No. 17
Northern California, Hawaii,
Pacific Trust Territory, Guam,
American Samoa

ESRD Network No. 18
Southern California

Suggested citation for this Report is as follows:

Centers for Medicare & Medicaid Services. 2006 Annual Report, End Stage Renal Disease Clinical Performance Measures Project. Department of Health and Human Services, Centers for Medicare & Medicaid Services, Office of Clinical Standards & Quality, Baltimore, Maryland, January 2007.

Note: The clinical data collected for the 2006 ESRD Clinical Performance Measures Project were from the time period of October–December 2005 for the in-center hemodialysis patients and October 2005–March 2006 for the peritoneal dialysis patients.

2007 Data Collection Effort

In 2007, we will again collect data for the ESRD Clinical Performance Measures on a national sample of adult in-center hemodialysis and peritoneal dialysis patients and all pediatric in-center hemodialysis and peritoneal dialysis patients.

Any questions about the Project may be addressed to your ESRD Network staff (APPENDIX 4).

Look for this Report, as well as other ESRD Clinical Performance Measures Project and Core Indicators Project Reports, by clicking on “Measures and Data Collection” on the Internet at: www.cms.hhs.gov/CPMProject.

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TABLE OF CONTENTS

SECTION	TITLE	PAGE
	Table of Contents	3
	Acknowledgments/Acronyms	4
I.	INTRODUCTION	5
II.	BACKGROUND AND PROJECT METHODS	6
	A. Medicare's ESRD Program	6
	B. Project Methods	7
	C. Sample Selection.....	8
	D. Report Format.....	10
III.	CLINICAL PERFORMANCE MEASURES (CPMs).....	13
IV.	OTHER SIGNIFICANT FINDINGS AND TRENDS	17
V.	ADULT IN-CENTER HEMODIALYSIS PATIENTS	24
	A. Adequacy of Hemodialysis	24
	B. Vascular Access	28
	C. Anemia Management	36
	D. Serum Albumin	41
VI.	ADULT PERITONEAL DIALYSIS PATIENTS	45
	A. Adequacy of Peritoneal Dialysis.....	45
	B. Anemia Management	46
	C. Serum Albumin	49
VII.	PEDIATRIC IN-CENTER HEMODIALYSIS PATIENTS	51
	A. Clearance	51
	B. Vascular Access	52
	C. Anemia Management	54
	D. Serum Albumin	56
VIII.	PEDIATRIC PERITONEAL DIALYSIS PATIENTS	58
	A. Clearance	58
	B. Anemia Management	59
	C. Serum Albumin	59
IX.	REFERENCES	62
X.	LIST OF TABLES AND FIGURES	64
	1. List of Tables	64
	2. List of Figures	66
XI.	APPENDICES	70
	1. ESRD CPMs for 2006 Data Collection Effort	70
	2. 2006 CPM Data Collection Form – In-Center Hemodialysis	76
	3. 2006 CPM Data Collection Form – Peritoneal Dialysis	82
	4. Centers for Medicare & Medicaid Services (CMS) Offices and ESRD Networks	88
	5. List of Publications and Abstracts of ESRD CPM and Core Indicators Data	89
	6. 2006 National CPM Data Collection, Adult In-Center Hemodialysis Patients – National and Network Profiles.....	99
	7. 2006 ESRD CPM Outcome Comparison Tool – Adult In-Center Hemodialysis Patients	102
	8. 2006 ESRD CPM Outcome Comparison Tool – Adult Peritoneal Dialysis Patients	104

ACKNOWLEDGMENTS

The Centers for Medicare & Medicaid Services (CMS) wishes to acknowledge the following groups and persons without whose efforts this Report would not have been possible:

- The eighteen ESRD Network Organizations throughout the United States (See Appendix 4).
- The staff at Arbor Research Collaborative for Health and University of Michigan Kidney Epidemiology and Cost Center.
- The following CMS Central Office staff: Diane L. Frankenfield, DrPH, Pamela R. Frederick, and Melinda Jones.
- The staff at The Renal Network, Inc.
- The staff at more than 3,690 dialysis facilities in the United States who abstracted the requested information from medical records on more than 8,000 adult in-center hemodialysis, adult peritoneal dialysis, and pediatric in-center hemodialysis and peritoneal dialysis patients.
- The many other individuals in the renal community and CMS who contributed to this work.

ACRONYMS

List of Commonly Used Acronyms

AM Anemia Management	IV Intravenous
AV Arterio Venous	KDOQI Kidney Disease Outcomes Quality Initiative
AVF Arteriovenous Fistula	KoA Dialyzer Mass Transfer Area Coefficient
BBA Balanced Budget Act	Kt/V or Kt/V_{urea} Urea Clearance x Time/Volume of Distribution of Urea (fractional clearance of urea)
BCG Bromcresol Green Laboratory Method	KUf Ultrafiltration Coefficient
BCP Bromcresol Purple Laboratory Method	LDO Large Dialysis Organization
BMI Body Mass Index	NIH National Institutes of Health
BSA Body Surface Area	NIPD Nightly Intermittent Peritoneal Dialysis
BUN Blood Urea Nitrogen	NKF National Kidney Foundation
CAPD Continuous Ambulatory Peritoneal Dialysis	PET Peritoneal Equilibration Test
CCPD Continuous Cycling Peritoneal Dialysis	PD Peritoneal Dialysis
CI Confidence Interval	QA Quality Assurance
CIP Core Indicators Project	QI Quality Improvement
CMS Centers for Medicare & Medicaid Services	RRF Residual Renal Function
CPM Clinical Performance Measure	SC Subcutaneous
CQI Continuous Quality Improvement	SD Standard Deviation
CrCl Creatinine Clearance	SIMS Standard Information Management System
CSC Computer Sciences Corporation	SI Units Système International Units
DM Diabetes Mellitus	SLE Systemic Lupus Erythematosus
DOQI Dialysis Outcomes Quality Initiative	spKt/V Single-Pool Kt/V
D/P Cr Ratio Dialysate/Plasma Creatinine Ratio	SPSS Statistical Package for the Social Sciences
ESA Erythropoietin Stimulating Agents	TCV Total Cell Volume
ESRD End-Stage Renal Disease	TSAT Transferrin Saturation
FSGS Focal and Segmental Glomerulosclerosis	UKM Urea Kinetic Modeling
GFR Glomerular Filtration Rate	URR Urea Reduction Ratio
HCFA Health Care Financing Administration	USRDS United States Renal Data System
HCQIP Health Care Quality Improvement Program	VA Vascular Access
HD Hemodialysis	
Hgb Hemoglobin	

I. INTRODUCTION

The ESRD Clinical Performance Measures (CPM) Project, now in its thirteenth year, is a national effort led by the Centers for Medicare & Medicaid Services (CMS) and its eighteen ESRD Networks to assist dialysis providers to improve patient care and outcomes. Since 1994 the Project has documented continued improvements, specifically in the areas of adequacy of dialysis and anemia management. We commend the providers of dialysis services for their ongoing efforts to improve patient care.

The 2006 ESRD CPM Annual Report describes the findings of several important clinical measures and characteristics of a nationally representative random sample of adult (aged ≥ 18 years) in-center hemodialysis patients and peritoneal dialysis patients. This Report also includes the findings for all in-center hemodialysis and peritoneal dialysis patients aged < 18 years.

The most recent data described in this Report are from the 2006 study period which includes the months of October–December 2005 for the in-center hemodialysis patients and October 2005–March 2006 for the peritoneal dialysis patients. This Report also compares the 2006 study period findings to findings from previous study periods AND it identifies opportunities to improve care for dialysis patients.

The full Report can be found on the Internet at www.cms.hhs.gov/CPMProject, and clicking on “Measures and Data Collection”. PowerPoint files containing all of the figures in this Report can also be found at this Internet site. Please feel free to use any of these slides in presentations and quality improvement activities.

This Report contains seven major sections: **Background and Project Methods, Clinical Performance Measures (CPMs), Other Significant Findings and Trends, Adult In-Center Hemodialysis Patients, Adult Peritoneal Dialysis Patients, Pediatric In-Center Hemodialysis (aged < 18), and Pediatric Peritoneal Dialysis Patients (aged < 18)**. The list of tables and figures are located at the back of the Report as Section X (page 64).

NOTE: Highlights of important findings from the 2006 ESRD CPM Project may be found on the following pages:

- CPM highlights for adult hemodialysis patients, page 15
- CPM highlights for adult peritoneal dialysis patients, page 16
- Selected significant findings for adult in-center hemodialysis patients, page 20
- Selected significant findings for adult peritoneal dialysis patients, page 21
- Selected significant findings for pediatric in-center hemodialysis patients, page 22
- Selected significant findings for pediatric peritoneal dialysis patients, page 23

This Report also contains features and tools to assist dialysis providers in using the information presented here. Appendices 7 and 8 (pages 102 and 104) contain tear-out ESRD CPM Outcomes Comparison Tools (one for hemodialysis and one for peritoneal dialysis) that providers can use to record their facility-specific results for comparisons to national and Network findings (Network rates are only available for hemodialysis results). (Note: Each provider will have to calculate its own facility-specific results to record on this tool.) Even though the national and Network hemodialysis findings included in this Report are from the time period October–December 2005 (national peritoneal dialysis findings are from the time period October 2005–March 2006), the facility data that you calculate and enter on this form can be from any time period. Appendix 6 provides you with some Network-level hemodialysis findings that you can use to record on your Network’s Outcomes Comparison Tool (Appendix 7). On the back of each tool are two graphs that can be used to record monthly facility-specific adequacy and anemia management results. We encourage each dialysis facility to use these tools. Consider posting the charts somewhere in the dialysis facility that is visible to staff and patients so everyone can follow the monthly entries.

The **Background and Project Methods** section, beginning on page 6, provides information on the Medicare ESRD program and why the ESRD CPM Project was initiated. Patient selection criteria and data collection and analysis methodologies are also described.

The **ESRD Clinical Performance Measures (CPMs)** section, beginning on page 13, has a short summary of each CPM collected for this project as well as a brief summary of the 2006 CPM findings. Appendix 1 (page 71) provides a more detailed description of each CPM.

The **Other Significant Findings and Trends** section, beginning on page 17, provides highlights of important findings from the 2006 ESRD CPM Project.

The **Adult In-Center Hemodialysis Patients, Adult Peritoneal Dialysis Patients, Pediatric In-Center Hemodialysis Patients, and Pediatric Peritoneal Dialysis Patients** sections describe the findings for each cohort for the 2006 study period and compare these findings to previous study periods.

This Report provides the dialysis community with Network and national profiles for the clinical measures that were collected for the ESRD CPM Project. While significant improvements in care have occurred, there are still opportunities to improve care for dialysis patients in the U.S. in the areas of adequacy of dialysis, vascular access, and anemia management. Every dialysis caregiver should be familiar with the clinical practice guidelines developed by the Renal Physicians Association (1) and the National Kidney Foundation Kidney Disease Outcomes Quality

Initiative (NKF-KDOQI) (2-5). Your Network staff and Medical Review Board are also available to assist you in identifying opportunities for improvement.

In the future, the ESRD Networks, in collaboration with dialysis facilities, will continue to assess the ESRD CPMs for dialysis patients in the U.S. The purpose of these efforts will be to assess improvement in care and to encourage further improvements. The ultimate goal is to improve patient care and outcomes for all ESRD patients.

Serum Albumin

Although serum albumin is not a CPM for this data collection period, it is known to be an important indicator of patient health and was chosen as an indicator for assessing mortality risk for adult in-center hemodialysis patients and adult peritoneal dialysis patients. This project collects the serum albumin value as well as the test method, (bromocresol green [BCG] method and bromocresol purple [BCP] method), because these two methods are commonly used for determining serum albumin concentrations and have been reported to yield systematically different results—the BCG method yielding higher serum albumin concentrations than the BCP method (6).

For the history of this project, mean serum albumin values < 3.5 g/dL (35 g/L) by the BCG method have been defined as an indicator of inadequate serum albumin. Since the percent of mean serum albumin values < 3.2 g/dL (32 g/L) by the BCP method was nearly the same as the percent of mean serum albumin values < 3.5 g/dL (35 g/L) by the BCG method, for the purposes of this report we have historically also defined a BCP result < 3.2 g/dL (32 g/L) as an indicator of inadequate serum albumin. In June 2000, the NKF-KDOQI Guidelines for Nutrition in Chronic Renal Failure were published. Guideline 3 of the Clinical Practice Guidelines states that a pre-dialysis or stabilized serum albumin equal to or greater than the lower limit of normal range (approximately 4.0 g/dL [40 g/L] for the bromocresol green method) is the outcome goal (7).

Findings from this project allow us to report the percentage of patients with mean serum albumin values \geq 4.0 g/dL (40 g/L) (BCG method) or \geq 3.7 g/dL (37 g/L) (BCP method) and the percent of patients with mean serum albumin values \geq 3.5 g/dL (35 g/L) (BCG method) or \geq 3.2 g/dL (32 g/L) (BCP method) nationally for all hemodialysis and peritoneal dialysis patients (both adult and pediatric), and for adult hemodialysis patients in each Network area.

Pediatric In-Center Hemodialysis and Peritoneal Dialysis Patients

Although there are no CPMs established for the pediatric age group, demographic and clinical information from October-December 2005 were collected on all hemodialysis patients aged < 18 years and from October

2005-March 2006 on all peritoneal dialysis patients aged < 18 years in the U.S. in order to describe several core indicators of dialysis care. These core indicators included dialysis clearance, vascular access (hemodialysis only), anemia management, and serum albumin.

II. BACKGROUND AND PROJECT METHODS

A. MEDICARE'S ESRD PROGRAM

The Social Security Amendments of 1972 (PL 92-603) extended Medicare coverage to individuals with end-stage renal disease (ESRD) or chronic kidney failure who require dialysis or a kidney transplant to maintain life. To qualify for Medicare under the renal provision, a person must have ESRD and either be entitled to a monthly insurance benefit under Title II of the Social Security Act (or an annuity under the Railroad Retirement Act); or be fully or currently insured under Social Security; or be the spouse or dependent child of a person who meets at least one of these last two requirements. There is no minimum age for eligibility under the renal disease provision. The incidence of treated ESRD in the United States is 339 per million population (8). As of December 31, 2004, there were 320,404 patients receiving dialysis therapy in the United States (9).

ESRD Health Care Quality Improvement Program (HCQIP)

CMS, which oversees the Medicare program, contracts with 18 ESRD Network Organizations throughout the United States. The ESRD Networks stimulate and facilitate improvements in the quality of care for ESRD patients throughout the U.S. In 1994, CMS, with input from the renal community, reshaped the approach of the ESRD Network program to focus on quality assurance and improvement in order to respond to the need to improve the care of Medicare ESRD patients (10). This approach was named the ESRD Health Care Quality Improvement Program (HCQIP).

The ESRD HCQIP allows the ESRD Networks and CMS a chance to demonstrate that health care provided to Medicare beneficiaries with renal disease can be measurably improved. The HCQIP is based on the assumption that most health care providers welcome information and, where necessary, help in applying the tools and techniques of quality management (11).

ESRD Core Indicators Project

One activity included in the ESRD HCQIP was the National/Network ESRD Core Indicators Project (CIP). This project was initiated in 1994 as a national intervention approach to assist dialysis providers in the improvement of patient care and outcomes. The ESRD CIP was CMS's first nationwide population-based project designed to assess and identify opportunities to improve the care of patients

with ESRD (12). This project established the first consistent clinical ESRD database. The elements included in the database represent clinical measures thought to be indicative of key components of care surrounding dialysis. As such, the data points are considered “indicators” for use in triggering improvement activities.

ESRD Clinical Performance Measures Project

Section 4558(b) of the Balanced Budget Act (BBA) of 1997 required CMS to develop and implement by January 1, 2000, a method to measure and report quality of renal dialysis services provided under the Medicare program. To implement this legislation, CMS funded the development of Clinical Performance Measures (CPMs) based on the National Kidney Foundation (NKF) Dialysis Outcomes Quality Initiative (DOQI) Clinical Practice Guidelines (13-16).

For information regarding the development of the CPMs, please refer to the 1999 Annual Report, End-Stage Renal Disease Clinical Performance Measures Project on the Internet by clicking on “Archives” at www.cms.hhs.gov/esrdQualityImprove/nit/.

On March 1, 1999, the ESRD CIP was merged with the ESRD CPM Project, and this project is now known as the ESRD CPM Project. The ESRD CPMs are similar to the core indicators with the addition of measures for assessing vascular access.

This 2006 ESRD CPM Project Annual Report provides the results of the CPMs for a sample of adult in-center hemodialysis patients and adult peritoneal dialysis patients. Findings on all pediatric (aged < 18 years) in-center hemodialysis patients and all pediatric (aged < 18 years) peritoneal dialysis patients are also included. The Report does not provide results on a dialysis facility-specific basis. The quality of dialysis services is reported for adult and pediatric in-center hemodialysis patients for the last quarter in 2005 and adult and pediatric peritoneal dialysis patients for the time period October 2005–March 2006.

CMS and the ESRD Networks are committed to improving ESRD patient care and outcomes by providing tools that can be used by the renal community in assessing patient care processes and outcomes, and by identifying opportunities for improvement. One of these tools includes data feedback reports based on the clinical information obtained from the ESRD CPM Project. We invite the renal community to provide us with ideas and feedback as to ways CMS and the Networks can best help the community to improve patient care.

B. PROJECT METHODS

The purpose of the ESRD CPM Project is to provide comparative data to ESRD caregivers to assist them in

assessing and improving the care provided to dialysis patients. The data collected in 1994 (for the time period October-December 1993) established a baseline estimate for important clinical measures of care for adult in-center hemodialysis patients in the United States (17). From 1994 to 1998, CMS collected ESRD data under the ESRD CIP. The purpose of these data collections was to determine whether patterns in these clinical measures had changed and if opportunities to improve care continued to exist (18-22).

The initial data collection effort for the ESRD CPMs was conducted in 1999. This effort examined data from October–December 1998 for adult in-center hemodialysis patients, and from October 1998 to March 1999 for adult peritoneal dialysis patients. Information to calculate the CPMs was collected and further opportunities to improve care were identified (23).

This Report describes the findings from the eighth data collection effort for the ESRD CPMs, which was conducted in 2006. Data were collected from October-December 2005 for adult and pediatric in-center hemodialysis patients, and from October 2005 -March 2006 for adult and pediatric peritoneal dialysis patients. These data help to determine if there are opportunities to improve care and to evaluate patterns of care across the nation.

The Sample

Annually, each ESRD Network conducts a survey of ESRD facilities to validate the census of ESRD patients in the Network at the end of the calendar year. In March 2006, a listing of adult (aged ≥ 18 years as of September 30, 2005) in-center hemodialysis and adult peritoneal dialysis patients who were alive and dialyzing on December 31, 2005, was obtained from each of the 18 ESRD Networks.

From this universe of patients, a national random sample of adult in-center hemodialysis patients was drawn, stratified by Network. The sample size of adult in-center hemodialysis patients was selected to allow estimation of a proportion with a 95% confidence interval (CI) around that estimate no larger than 10 percentage points (i.e., $\pm 5\%$) for Network-specific estimates of the key hemodialysis CPMs and other indicators. Additionally, a 30% over-sample was drawn to compensate for an anticipated non-response rate and to assure a large enough sample of the adult in-center hemodialysis patient population who were dialyzing at least six months prior to October 1, 2005. The final sample consisted of 8,915 adult in-center hemodialysis patients.

The peritoneal dialysis patient sample included a random selection of 5% of all adult peritoneal dialysis patients in the nation. Additionally, a 10% over-sample was drawn to compensate for an anticipated non-response rate. The final sample consisted of 1,469 peritoneal dialysis patients.

All pediatric (aged < 18 years) in-center hemodialysis patients in the U.S. (n = 803) and all pediatric peritoneal dialysis patients in the U.S. (n = 807) were included in the 2006 ESRD CPM Study.

C. SAMPLE SELECTION

Data Collection

Two data collection forms were used: a four-page in-center hemodialysis form and a four-page peritoneal dialysis form (Appendices 2, 3; Pages 76, 82 respectively); the use of these forms was authorized through the National Institutes of Health (NIH) clinical exemption process. Descriptive information on each selected patient and dialysis facility was printed onto the data collection forms that were downloaded by Networks from the Network Standard Information Management System (SIMS). If demographic information (e.g., name, date of birth, race) or clinical information (e.g., date that initial dialysis occurred) was incorrect, facility staff were asked to correct the information on the forms. Staff at ESRD facilities were also asked to abstract clinical information from the medical record of each selected patient, and were instructed to obtain ethnicity information from the patient.

Electronic data for some of the data elements were accepted from the large dialysis organizations (LDOs) — Fresenius Medical Care N.A.; Dialysis Clinic, Inc.; and Davita, Inc. The electronically submitted data were printed onto paper forms, and these paper forms were sent to facilities for sampled patients. Facility staff were instructed to supply the data not already provided on the paper form. These updated paper collection forms were then forwarded to the appropriate Network, where data were reviewed for acceptability and manually entered into the Network database using SIMS.

Facilities that were not part of an LDO (non-LDO facilities) and had one or more patients in the samples received a blank paper data collection form as in past study years. Clinical information contained in the medical record was abstracted for each patient in the adult hemodialysis sample and for all pediatric in-center hemodialysis patients who received in-center hemodialysis at any time during October, November, and December 2005. Clinical information contained in the medical records was also abstracted for each patient in the adult peritoneal dialysis sample and for all pediatric peritoneal dialysis patients who were receiving peritoneal dialysis at any time during October 2005-March 2006. The completed data collection forms were then forwarded to the appropriate Network, where data were reviewed for acceptability and manually entered into SIMS.

In October 2006, each Network completed data entry into SIMS. CMS's contractor, Computer Sciences Corporation (CSC) aggregated the data and submitted it to Arbor Research Collaborative for Health (CMS Contractor) for analysis.

Adult In-Center Hemodialysis

Initial analyses for the CPMs and other indicators focused on the following elements: paired pre- and post-dialysis blood urea nitrogen (BUN) values with patient height, weight, and dialysis session length (used to calculate spKt/V values); hemoglobin values; vascular access information; and serum albumin levels.

To be included in the analysis file, a patient must have had data available for at least one of the months in the three-month project period, with at least one paired pre- and post-dialysis BUN, at least one hemoglobin, and at least one serum albumin. We were able to include for analysis 8,609 of the 8,915 patients from the sample (response rate = 97%) (TABLE 1). In the vascular access section, some findings are presented for incident patients alone. An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005. Other findings in this section are presented for prevalent or all patients, which includes incident patients.

Characteristics regarding the gender, race, ethnicity, age, diagnosis, and duration of dialysis (years) for these patients are shown in Table 2. As expected, the characteristics of this random sample were very similar to the characteristics of the overall U.S. hemodialysis population (8). Data regarding erythropoietin stimulating agent (ESA) use, serum ferritin concentrations, transferrin saturation, iron use, and actual time on dialysis were also analyzed. The initial analysis utilized SAS v.8.02 and Statistical Package for the Social Sciences (SPSS) software (24, 25).

For this Report, each patient's mean value for the three-month project period was determined from the available data for the following items: spKt/V (calculated using the Daugirdas II formula [26]), dialysis session length, hemoglobin, transferrin saturation, serum ferritin concentration, and serum albumin. Because we had data from a stratified random sample of patients (i.e., a separate random sample from each of the 18 Networks), it was necessary to weight the collected data in order to obtain unbiased estimates of mean clinical values for the total population. This weighting was assigned according to the proportion of each Network's total population sampled. Aggregate national results shown in this report were derived from weighted data; Network-specific comparisons were derived from unweighted data.

TABLE 1: Number of adult in-center hemodialysis patients in each Network in December 2005, sample size and response rate for the 2006 ESRD CPM Project.

Network	# HD Patients Dec 2005	Sample Size	# Acceptable Forms [^]	Response Rate %
1	9,782	488	471	96.5
2	21,127	500	473	94.6
3	12,845	493	486	98.6
4	13,524	492	482	98.0
5	17,758	499	490	98.2
6	28,570	501	495	98.8
7	17,442	499	476	95.4
8	16,667	500	491	98.2
9	21,457	501	484	96.6
10	12,429	495	461	93.1
11	18,750	496	470	94.8
12	10,797	491	472	96.1
13	11,754	490	477	97.3
14	26,836	497	491	98.8
15	13,416	494	484	98.0
16	7,577	482	473	98.1
17	15,357	497	462	93.0
18	23,883	500	471	94.2
Total	299,971	8,915	8,609	96.6

[^] A form was considered acceptable if the patient met the selection criteria for inclusion in the study and if data were provided for at least one of the months in the fourth quarter of 2005 for the following items: 1) hemoglobin; 2) paired pre- and post-dialysis BUN values; and 3) serum albumin value.

Two or more monthly values for these clinical measures were available for 97% of patients for hemoglobin and 96% for serum albumin by either BCG or BCP method. Monthly hemoglobin values were available for 91% of patients. At least one monthly paired pre-and post-dialysis BUN value was available for 100% of patients, and two or more were available for 95%. Monthly paired pre- and post-dialysis BUN values were available for 83% of patients.

Adult Peritoneal Dialysis

The initial analysis focused on the adequacy of peritoneal dialysis CPMs, anemia management CPMs, and serum albumin values. Inclusion of a case for analysis required that the patient received peritoneal dialysis at least one month during the time period October 2005–March 2006, and that at least one hemoglobin and at least one serum albumin value were reported during the six-month study period. Of the 1,469 patients sampled, 1,409 patients were included in the sample for analysis (96% response rate)

(TABLE 3). Selected patient characteristics of this sample for analysis were similar to the characteristics of the overall U.S. peritoneal dialysis population (TABLE 4).

For this Report, each patient's mean value for the six-month study period was determined from available data for the following items: weekly Kt/V_{urea} , weekly creatinine clearance, hemoglobin, serum albumin, prescribed epoetin or darbepoetin dose, serum ferritin concentration, and transferrin saturation. Information on iron prescription and route of administration was collected. The data are from a random sample, not stratified by Network; thus, only national aggregate data are reported. No Network-specific or facility-specific analyses were conducted.

Pediatric In-Center Hemodialysis Patients

Inclusion of a pediatric record for analysis required that data were available for at least one of the months in the three-month project period, with at least one paired pre- and post-dialysis BUN, at least one hemoglobin, and at least one serum albumin. Of the 803 pediatric hemodialysis patients, 743 patients were included in the sample for analysis (93%). Selected patient characteristics of this sample for analysis are shown in Table 5.

For this Report, each patient's mean value for the three-month project period was determined from the available data for the following items: $spKt/V$, dialysis session length, hemoglobin, transferrin saturation, serum ferritin concentration, prescribed epoetin or darbepoetin dose and route of administration, and serum albumin. Information on iron prescription and route of iron administration was collected. Data were collected on all pediatric in-center hemodialysis patients aged < 18 years in the U.S. Only national aggregate data are reported. No Network-specific or facility-specific analyses were conducted.

Pediatric Peritoneal Dialysis Patients

The Pediatric Peritoneal Dialysis Patients section describes findings for this cohort for the 2006 study period and compares these findings to the 2005 study period. Inclusion of a record for analysis required that the patient received peritoneal dialysis at least one month during the time period October 2005–March 2006 and that at least one hemoglobin value and at least one serum albumin value were reported during the six-month study period. Of the 807 pediatric peritoneal dialysis patients identified, 781 (97%) were included in the sample for analysis (TABLE 6).

TABLE 2: Characteristics of adult in-center hemodialysis patients in the 2006 ESRD CPM Project compared to those of all in-center hemodialysis patients in the U.S. in 2004.

Patient Characteristic	2006 CPM Sample for Analysis		All U.S. in 2004*	
	# [^]	%	# in 1,000s	%
TOTAL	8,609	100	307.1	100
GENDER				
Men	4,666	54	166.6	56.2
Women	3,943	46	140.5	47.4
RACE				
American Indian/ Alaska Native	156	2	4.6	1.5
Asian/Pacific Islander	335	4	12.8	4.3
Black or African American	3,129	36	116.5	39.3
White	4,915	57	167.7	56.6
Other/Unknown	74	1	5.6	1.9
ETHNICITY				
Hispanic	1,224	14	45.0	15.2
Non-Hispanic	7,383	86	262.1	88.4
AGE GROUP (years)				
18-49	1,823	21	67.5**	22.8
50-59	1,790	21	63.5	21.4
60-64	1,020	12	35.4	11.9
65-69	968	11	36.1	12.2
70-79	1,948	23	67.6	22.8
80+	1,060	12	35.6	12.0
CAUSE OF ESRD				
Diabetes Mellitus	3,763	44	132.3	44.6
Glomerulonephritis	855	10	33.8	11.4
Hypertension	2,269	26	87.7	29.6
Other/Unknown	1,716	20	53.4	18.0
DURATION OF DIALYSIS (years)				
< 0.5	1,084	13		
0.5-0.9	1,047	12		
1.0-1.9	1,552	18		
2.0-2.9	1,181	14		
3.0-3.9	885	10		
4.0+	2,828	33		

*USRDS: 2006 Annual Data Report, Bethesda, MD, National Institutes of Health, 2006. Table D.11

[^] Subgroup totals may not equal 8,609 due to missing data.

** For ages 20-49 years

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

For this Report, each patient's mean value for the six-month study period was determined from available data for the following items: weekly Kt/V_{urea}, weekly creatinine clearance, hemoglobin, serum albumin, prescribed epoetin or darbepoetin dose, serum ferritin concentration, and transferrin saturation. Information on iron prescription and route of administration was collected. The data were collected on all pediatric peritoneal dialysis patients aged < 18 years in the U.S. Only national aggregate data are reported. No Network-specific or facility-specific analyses were conducted.

D. REPORT FORMAT

This Report describes the clinical performance measures and other findings for both the adult in-center hemodialysis patient sample and the adult peritoneal dialysis patient sample in separate sections, V and VI, respectively, for the following study periods: October–December 2005 for the adult in-center hemodialysis patients, and October 2005–March 2006 for the adult peritoneal dialysis patients. This Report also describes findings on clinical parameters of care for pediatric in-center hemodialysis and peritoneal dialysis patients in the U.S. for October-December 2005 (hemodialysis) and October 2005-March 2006 (peritoneal dialysis) in Sections VII and VIII, respectively.

The national results are presented separately in tables by gender, race, ethnicity, age group (for adult patients: 18-44, 45-54, 55-64, 65-74, and 75+ years of age; for pediatric patients: 0-4, 5-9, 10-14, and 15 to < 18 years of age), diagnosis of ESRD, and duration of dialysis. The diagnoses are categorized as diabetes mellitus, hypertension, glomerulonephritis, and other/unknown for adult patients. In some instances clinical characteristics for patients in each Network area are also shown. Selected results are highlighted in accompanying figures. In addition, key findings from the 2006 CPM study period are compared to key findings from previous study periods.

TABLE 3: Number of adult peritoneal dialysis patients in each Network in December 2005, sample size and response rate for the 2006 ESRD CPM Project.

Network	# Peritoneal Dialysis Patients Dec 2005	Sample Size	# Acceptable Forms [^]	Response Rate %
1	1,134	69	63	91.3
2	1,161	72	66	91.7
3	863	45	45	100
4	905	67	66	98.5
5	1,625	85	85	100
6	2,599	144	143	99.3
7	1,355	57	54	94.7
8	1,737	95	94	98.9
9	2,173	115	107	93
10	1,159	63	61	96.8
11	1,676	99	93	93.9
12	1,264	71	66	93
13	1,033	64	61	95.3
14	1,951	110	108	98.2
15	1,244	65	63	96.9
16	1,038	56	56	100
17	1,772	85	78	91.8
18	1,997	107	100	93.5
Total	26,686	1,469	1,409	95.9

[^] A form was considered acceptable if the patient received peritoneal dialysis at least once during the six-month study period and met the selection criteria for inclusion in the study.

TABLE 4: Characteristics of adult peritoneal dialysis patients in the 2006 ESRD CPM Project compared to those of all peritoneal dialysis patients in the U.S. in 2004.

Patient Characteristic	2006 CPM Sample for Analysis		All U.S. in 2004*	
	# [^]	%	# in 1,000s	%
TOTAL	1,409	100	25.8	100.0
GENDER				
Men	694	49	13.3	51.6
Women	715	51	12.5	48.4
RACE				
American Indian/ Alaska Native	17	1	0.3	1.2
Asian/Pacific Islander	84	6	1.5	5.6
Black or African American	382	27	6.7	26.0
White	915	65	16.8	65.2
Other/Unknown	11	1	0.5	1.9
ETHNICITY				
Hispanic	175	12	3.3	12.9
Non-Hispanic	1,234	88	22.5	87.1
AGE GROUP (years)				
18-49	481	34	8.4**	32.5**
50-59	368	26	5.9	23.0
60-64	155	11	2.8	10.8
65-69	116	8	2.6	10.0
70-79	213	15	3.9	15.1
80+	76	5	1.2	4.8
CAUSE OF ESRD				
Diabetes Mellitus	488	35	8.8	34.2
Glomerulonephritis	213	15	4.9	19.1
Hypertension	317	22	6.1	23.8
Other/Unknown	391	28	5.9	22.9
DURATION OF DIALYSIS (years)				
< 0.5	191	14		
0.5-0.9	205	15		
1.0-1.9	312	22		
2.0-2.9	217	15		
3.0-3.9	137	10		
4.0+	340	24		

*USRDS: 2006 Annual Data Report, Bethesda, MD, National Institutes of Health, 2006. Table D.11

[^] Subgroup totals may not equal 1,409 due to missing data.

** For ages 20-49 years

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

A form was considered acceptable if the patient met the selection criteria for inclusion in the study and if data were provided at least once during the six-month study period for hemoglobin and serum albumin.

Two or more values were available for 98% of patients for hemoglobin and 98% for serum albumin by either BCG or BCP methods. Three hemoglobin values were available for 85% of patients; three serum albumin values were available for 84% of patients.

TABLE 5: Characteristics of pediatric (aged < 18 years) in-center hemodialysis patients in the 2006 ESRD CPM Project.

Patient Characteristic	2006 CPM Project	
	#^	%
TOTAL	743	100
GENDER		
Males	404	54
Females	339	46
RACE		
American Indian/Alaska Native	20	3
Asian/Pacific Islander	26	3
Black or African American	285	38
White	406	55
Other/Unknown	*	*
ETHNICITY		
Hispanic	236	32
Non-Hispanic	507	68
AGE GROUP (years)		
0-4	42	6
5-9	74	10
10-14	215	29
15 to <18	412	55
CAUSE OF ESRD		
Cystic Disease	19	3
Diabetes	*	*
Glomerulonephritis	95	13
Hypertension	35	5
FSGS^^	106	14
Congenital/Urologic	147	20
Other/Unknown	341	46
DURATION OF DIALYSIS (years)		
< 0.5	155	21
0.5-0.9	125	17
1.0-1.9	150	20
2.0-2.9	85	11
3.0-3.9	52	7
4.0+	175	24

^Subgroup totals may not equal 743 due to missing data.

^^FSGS = Focal and Segmental Glomerulosclerosis

*Data not displayed, n < 11.

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

A form was considered acceptable if the patient met the selection criteria for inclusion in the study and if data were provided for at least one of the months in the fourth quarter of 2005 for the following items: 1) hemoglobin; 2) paired pre- and post-dialysis BUN values; and 3) serum albumin value.

Two or more monthly values for these clinical measures were available for 94% of patients for hemoglobin and 93% for serum albumin by either BCG or BCP method. Monthly hemoglobin values were available for 86% of patients. At least one monthly paired pre- and post-dialysis BUN value was available for 100% of patients, and two or more were available for 91%. Monthly paired pre- and post-dialysis BUN values were available for 78% of patients.

TABLE 6: Characteristics of pediatric (aged < 18 years) peritoneal dialysis patients in the 2006 ESRD CPM Project.

Patient Characteristic	2006 CPM Project	
	#^	%
TOTAL	781	100
GENDER		
Males	426	55
Females	355	45
RACE		
American Indian/Alaska Native	*	*
Asian/Pacific Islander	30	4
Black or African American	205	26
White	526	67
Other/Unknown	11	1
ETHNICITY		
Hispanic	227	29
Non-Hispanic	554	71
AGE GROUP (years)		
0-4	192	25
5-9	124	16
10-14	258	33
15 to <18	207	27
CAUSE OF ESRD		
Cystic Disease	30	4
Glomerulonephritis	75	10
Hypertension	*	*
FSGS	116	15
Congenital/Urologic	201	26
Other/Unknown	349	45
DURATION OF DIALYSIS (years)		
< 0.5	166	21
0.5-0.9	153	20
1.0-1.9	196	25
2.0-2.9	87	11
3.0-3.9	60	8
4.0+	111	14

^Subgroup totals may not equal 781 due to missing data.

*Data not displayed, n < 11.

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

A form was considered acceptable if the patient met the selection criteria for inclusion in the study and if data were provided at least once during the six-month study period for hemoglobin and serum albumin.

Two or more values were available for 97% of patients for hemoglobin and 97% for serum albumin by either BCG or BCP methods. Three hemoglobin values were available for 83% of patients; three serum albumin values were available for 81% of patients.

III. CLINICAL PERFORMANCE MEASURES (CPMs)

The clinical information abstracted by dialysis facility staff is used in this Report to describe some of the CPMs that were developed from the NKF-KDOQI Guidelines and other quality indicators for several aspects of care for adult dialysis patients. These CPMs do not apply to patients under the age of 18 years. The CPMs were developed in the areas of hemodialysis and peritoneal dialysis adequacy, vascular access and anemia management. A complete description of the 13 CPMs appears in Appendix 1 (page 70); brief descriptions follow here.

The Hemodialysis Adequacy CPMs described in this Report are:

CPM I. The patient's delivered dose of hemodialysis is measured at least once per month.

CPM II. The patient's delivered dose of hemodialysis reported in the patient's chart is calculated by using formal urea kinetic modeling (UKM) or the Daugirdas II formula for spKt/V .

CPM III. For those patients on hemodialysis six months or longer and dialyzing three times per week, the delivered dose of hemodialysis calculated from data points on the data collection form (monthly measurement averaged over the three-month study period) is $\text{spKt/V} \geq 1.2$.

The clinical information collected to calculate these adequacy CPMs also allows us to describe other aspects or indicators of dialysis adequacy, such as the mean spKt/V values for hemodialysis patients in each Network area and in the U.S.

The Peritoneal Dialysis Adequacy CPMs described in this Report are:

CPM I. The patient's total solute clearance for urea and creatinine is measured routinely (defined for this report as at least once during the six-month study period).

CPM II. The patient's total solute clearance for urea (weekly $\text{Kt/V}_{\text{urea}}$) and creatinine (weekly creatinine clearance) is calculated in a standard way. (See Peritoneal Dialysis Adequacy CPM II in Appendix 1, page 71).

CPM III. For patients on continuous ambulatory peritoneal dialysis (CAPD), the delivered peritoneal dialysis dose is a total $\text{Kt/V}_{\text{urea}}$ of at least 2.0 per week and a total creatinine clearance (CrCl) of at least 60 L/week/1.73 m² — OR there is evidence that the dialysis prescription was changed if the adequacy measurements were below these thresholds.

For Cycler patients, the weekly delivered peritoneal dialysis dose is a total $\text{Kt/V}_{\text{urea}}$ of at least 2.1 and a weekly total creatinine clearance of at least 63L/week/1.73 m² — OR there is evidence that the dialysis prescription was changed if the adequacy measurements were below these thresholds.

The Vascular Access CPMs described in this Report are:

CPM I. A primary arteriovenous fistula (AVF) should be the access for at least 50% of all new patients initiating hemodialysis. A native AVF should be the primary access for at least 40% of prevalent patients undergoing hemodialysis.

CPM II. Less than 10% of chronic maintenance hemodialysis patients should be maintained on catheters continuously for ≥ 90 days as their permanent chronic dialysis access.

CPM III. A patient's AV graft should be routinely monitored for stenosis. (See Vascular Access CPM III in Appendix 1, page 74 for a list of techniques and frequency of monitoring used to screen for the presence of stenosis.)

The Anemia Management CPMs described in this Report are:

CPM I. The target hemoglobin for patients prescribed epoetin is 11-12 g/dL (110-120 g/L). Patients with a mean hemoglobin > 12 g/dL (120 g/L) and not prescribed epoetin were excluded from analysis for this CPM.

CPM Ila. For anemic patients (hemoglobin < 11 g/dL (110 g/L) in at least one study month) or patients prescribed epoetin, the percent transferrin saturation and serum ferritin concentration are assessed (measured) at least once in a three-month period for hemodialysis patients and at least two times during the six-month study period for peritoneal dialysis patients.

CPM Iib. For anemic patients (hemoglobin < 11 g/dL (110 g/L) in at least one study month) or patients prescribed epoetin, at least one serum ferritin concentration ≥ 100 ng/mL and at least one transferrin saturation $\geq 20\%$ were documented during the three-month study period for hemodialysis patients or during the six-month study period for peritoneal dialysis patients.

CPM III. All anemic patients (hemoglobin < 11 g/dL (110 g/L) in at least one study month) or patients prescribed epoetin, and with at least one transferrin saturation $< 20\%$ or at least one serum ferritin concentration < 100 ng/mL during the study period are prescribed IV iron; UNLESS the mean transferrin saturation was $\geq 50\%$ or the mean serum

ferritin concentration was ≥ 800 ng/mL; or UNLESS the patient was in the first three months of dialysis and was prescribed oral iron.

The clinical information collected to calculate these CPMs allows us to describe other aspects or indicators of anemia management. For example, the percentages of patients with a mean hemoglobin ≥ 11 g/dL (110 g/L) and < 10 g/dL (100 g/L) are profiled in this Report. Additionally, the percentages of all patients with mean transferrin saturation $\geq 20\%$, mean serum ferritin concentration ≥ 100 ng/mL, and the percentages of patients prescribed subcutaneous (SC) epoetin or IV iron are profiled.

Information was collected on epoetin and darbepoetin use during this data collection period. All monthly recorded data were used in determining the percentage of patients prescribed epoetin or darbepoetin.

All monthly recorded data were used in determining the percentage of patients prescribed any IV iron product.

The CPMs may have been calculated slightly differently than other findings reported in this Annual Report. Please refer to Appendix 1 (page 70) for the specific inclusion and exclusion criteria for each CPM.

Note Regarding Race

In this Report, several tables describe important clinical characteristics of adult in-center hemodialysis and peritoneal dialysis patients for the following race groups: American Indian/Alaska Native, Asian/Pacific Islander, Black, White, and Other/Unknown. In the accompanying figures, these clinical characteristics are compared by race group; however, the comparisons are limited to White vs. Black. The reason for this is sample size. Because of small sample size (TABLE 2), the 95% confidence intervals for estimates for some race groups — e.g., American Indian/Alaska Native, Asian/Pacific Islander — are very broad. On the other hand, the sample sizes for White and Black patients were large enough to provide stable estimates; i.e., the 95% confidence intervals are narrow.

CPM HIGHLIGHTS FROM THE NATIONAL 2006 ESRD PROJECT

Random Sample of Adult In-Center Hemodialysis (HD) Patients (n=8,609 sample for analysis)

The data are from OCT-DEC 2005:

HD Adequacy

- 82% of patients had monthly adequacy measurements performed (HD Adequacy CPM I)
- 76% of patients had their delivered spKt/V calculated using either UKM or the Daugirdas II formula (26) (HD Adequacy CPM II)
- 94% of patients on dialysis for 6 months or more and dialyzing three times a week had a mean delivered adequacy dose of spKt/V ≥ 1.2 calculated using the Daugirdas II formula (HD Adequacy CPM III)

Vascular Access (VA)

- 54% of incident patients were dialyzed using an AV fistula (AVF) (VA CPM I) (FIGURE 28)
- 44% of prevalent patients were dialyzed using an AVF (VA CPM I) (FIGURES 2, 28)
- 21% of prevalent patients were dialyzed with a chronic catheter continuously for 90 days or longer (VA CPM II) (FIGURE 2)

- 69% of prevalent patients with an AV graft were routinely monitored for the presence of stenosis (VA CPM III)

Anemia Management (AM)

- 35% of targeted patients prescribed epoetin had a mean hemoglobin 11.0-12.0 g/dL (110-120 g/L) (AM CPM I)
- 95% of patients who met the inclusion criteria¹ had at least one documented transferrin saturation value and one documented serum ferritin concentration value during the study period (AM CPM IIa)
- 80% of patients who met the inclusion criteria¹ had at least one transferrin saturation $\geq 20\%$ and one serum ferritin concentration ≥ 100 ng/mL during the study period (AM CPM IIb)
- 81% of patients who met the inclusion criteria¹ were prescribed intravenous iron in at least one month during the study period (AM CPM III)

ESRD CPM Trends (percent of patients meeting the CPMs) ¹	Year							
	1998	1999	2000	2001	2002	2003 ⁴	2004	2005
HD Adequacy								
HD Adequacy CPM I (monthly measurement of delivered HD dose)	79	76	80	82	83	83	83	82
HD Adequacy CPM II (method of measurement of delivered dose)	99 ⁵	50	52	68	67	83	76	76
HD Adequacy CPM III (mean delivered HD dose ≥ 1.2)	85	90	91	92	92	94	95	94
Vascular Access								
Vascular Access CPM Ia (incident patient with an AVF ² as access)	26	28	27	29	27	35	37	54
Vascular Access CPM Ib (prevalent patients with an AVF as access)	26	27	30	31	33	35	39	44
Vascular Access CPM II (dialyzed with chronic catheter ³)	14	14	17	19	21	20	21	21
Vascular Access CPM III (AVF graft was routinely monitored for stenosis)	37	45	47	51	61	77	67	69
Anemia Management								
Anemia CPM I (mean Hgb 11-12 g/dL)	36	36	38	38	36	36	34	35
Anemia CPM IIa (iron stores assessed for anemic patients or patients prescribed Epoetin)	90	89	91	92	94	96	95	95
Anemia CPM IIb (iron stored maintained at KDOQI targets)	67	66	71	75	78	81	80	80
Anemia CPM III (administration of IV iron to anemic patients)	63	67	73	77	79	79	82	81
¹ See Appendix for a description of the inclusion and exclusion criteria								
² Arteriovenous fistula								
³ For 90 days or longer								
⁴ First year for Large Dialysis Organization (LDO) electronic data submission								
⁵ For 1998 only, accepted HD dose calculated using urea kinetic modeling (UKM), or Daugirdas II, or urea reduction ratio (URR); for all subsequent years, only UKM or Daugirdas II accepted.								

NOTE: When a single year, such as 2005, is used in displaying data, it refers to October, November, and December of that year for the hemodialysis patients.

CPM HIGHLIGHTS FROM THE NATIONAL 2006 ESRD PROJECT

**Random Sample of Adult Peritoneal Dialysis (PD) Patients (n=1,409 sample for analysis)
The data are from OCT 2005-March 2006:**

PD Adequacy

- 80% of patients had at least one measured total solute clearance for urea and creatinine (PD Adequacy CPM I) during the six-month study period (FIGURE 3)
- 41% of patients had their total solute clearance for urea and creatinine calculated in a standard way² (PD Adequacy CPM II) (FIGURE 3)
- 72% of CAPD patients had a mean weekly Kt/V_{urea} of ≥ 2.0 and a mean weekly creatinine clearance $\geq 60L/week/1.73m^2$ OR there was evidence the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period (PD Adequacy CPM III) (FIGURES 4, 41)
- 59% of Cyclers⁴ patients had a mean weekly Kt/V_{urea} of ≥ 2.1 and a mean weekly creatinine clearance $\geq 63 L/week/1.73m^2$ OR there was evidence the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period (PD Adequacy CPM III) (FIGURES 4, 41)

Anemia Management (AM)

- 30% of targeted patients prescribed epoetin had a mean hemoglobin between 11.0-12.0 g/dL (110-120 g/L) (AM CPM I)
- 76% of patients who met the inclusion criteria¹ for this CPM had at least two documented transferrin saturation values and two documented serum ferritin concentration values during the six-month study period (AM CPM IIa)
- 83% of patients who met the inclusion criteria¹ for this CPM had at least one transferrin saturation $\geq 20\%$ and one serum ferritin concentration $\geq 100 ng/mL$ during the six month study period (AM CPM IIb)
- 39% of patients who met the inclusion criteria¹ for this CPM were prescribed intravenous iron in at least one of the two-month periods during the six-month study period (AM CPM III)

ESRD CPM Trends (percent of patients meeting the CPMs) ¹	Year							
	1999	2000	2001	2002	2003	2004 ³	2005	2006
PD Adequacy								
PD Adequacy CPM I (measurement of total solute clearance at regular intervals)	82	83	85	86	88	86	82	80
PD Adequacy CPM II (weekly Kt/V_{urea} & weekly CrCl calculated in a standard way) ²	55	59	62	62	65	44	41	41
PD Adequacy CPM III (delivered PD dose meets KDOQI thresholds)								
CAPD	55	68	69	68	71	70	73	72
Cycler with daytime dwell	58	65	62	70	66	65	59	
Cycler without daytime dwell	45	66	64	61	67	62	58	
Cycler ⁴								59
Anemia Management								
Anemia CPM I (mean Hgb 11-12 g/dL)	32	34	39	36	39	39	33	30
Anemia CPM IIa (iron stores assessed for anemic patients or patients prescribed Epoetin)	70	68	72	74	77	79	77	76
Anemia CPM IIb (iron stores maintained at KDOQI targets)	72	70	75	76	81	83	82	83
Anemia CPM III (administration of IV iron to anemic patients)	17	18	23	31	32	29	31	39

¹See Appendix 1 for a description of the inclusion and exclusion criteria.

²See Appendix 1 for a description of standard ways for calculating total solute clearance.

³First year for Large Dialysis Organization (LDO) electronic data submission.

⁴For the Oct 2005-Mar 2006 collection, CCPD and NIPD were not distinguishable.

NOTE: When a single year, such as 2006, is used for the peritoneal dialysis patients, it refers to January, February, and March of that year, as well as October, November, and December of the previous year.

IV. OTHER SIGNIFICANT FINDINGS AND TRENDS

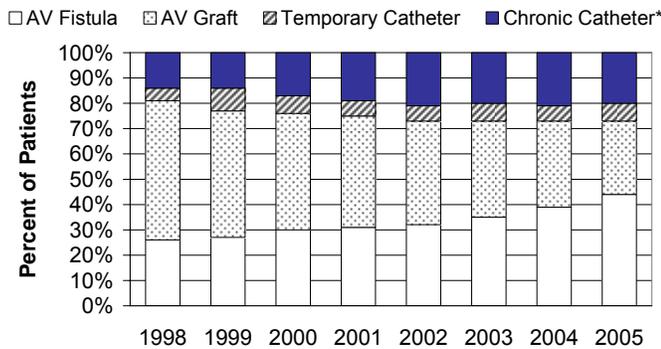
ESRD CPM Data Trends

The figures on the following pages show the trends in the ESRD CPM data for various study periods.

Please note that when a single year, such as 2005, is used in displaying data, it refers to October, November, and December of that year for hemodialysis patients. When a single year, such as 2006, is used for peritoneal dialysis patients, it refers to January, February, and March of that year as well as October, November, and December of the previous year. Also, "adult", refers to ages 18 ≥ years and "pediatric" refers to ages <18 years.

Vascular Access Trends

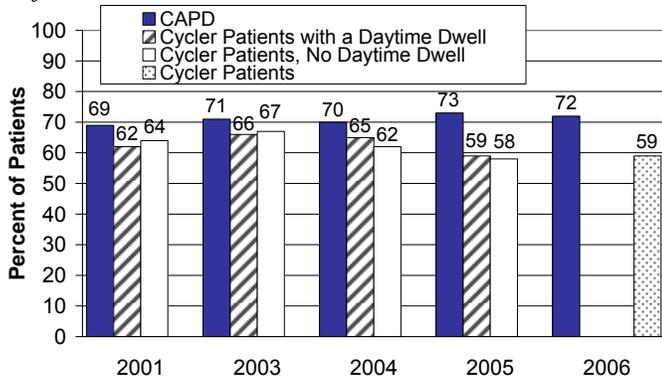
Figure 2: Vascular access type for all prevalent adult in-center hemodialysis patients on their last hemodialysis session during the study period. 2006 ESRD CPM Project.



*Chronic catheter defined as use of a catheter access continuously for 90 days or longer.

Peritoneal Dialysis Adequacy Trends

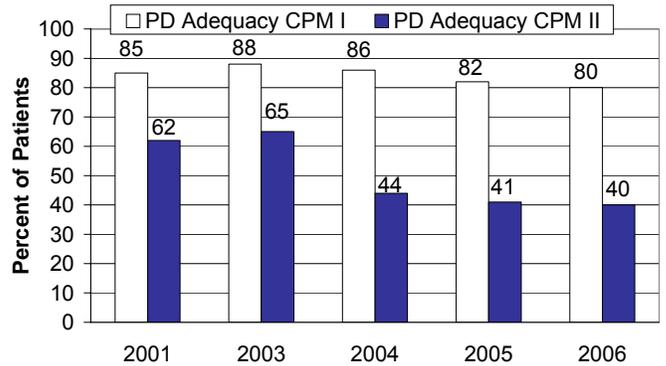
Figure 4: Percent of adult peritoneal dialysis patients meeting 1997 NKF-DOQI guidelines for weekly Kt/V_{urea} and weekly creatinine clearance (PD Adequacy CPM III). 2006 ESRD CPM Project.



Note: For Oct 2005-Mar 2006 collection, CCPD and NIPD were not distinguishable.

Peritoneal Dialysis Adequacy Trends

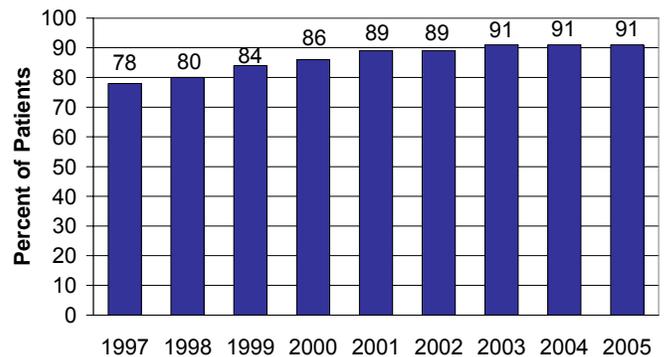
Figure 3: Percent of adult peritoneal dialysis patients with total solute clearance for urea and creatinine measured at least once during the study period (PD Adequacy CPM I) and with total solute clearance calculated in a standard way (PD Adequacy CPM II)*, Oct 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.



*See Appendix 1 for a complete description of the standard methods to calculate the solute clearance for urea and creatinine. Note: 2004 was first year for Large Dialysis Organization (LDO) electronic data submission.

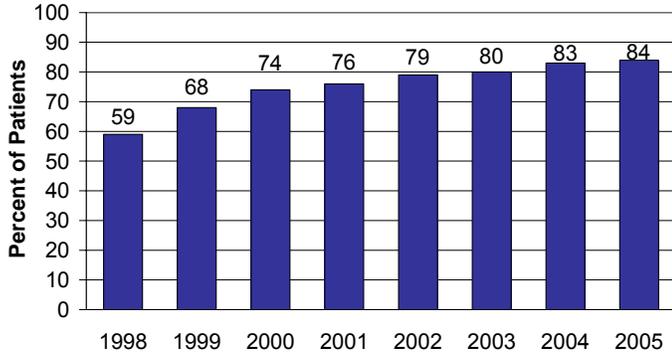
Hemodialysis Adequacy Trends

Figure 5: Percent of adult in-center hemodialysis patients with mean delivered calculated, single session single pool (sp)Kt/V ≥ 1.2 in October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



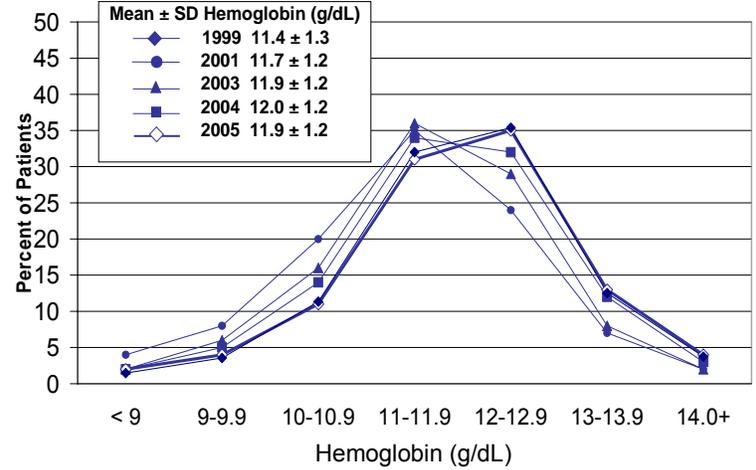
Anemia Management Trends

Figure 6: Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



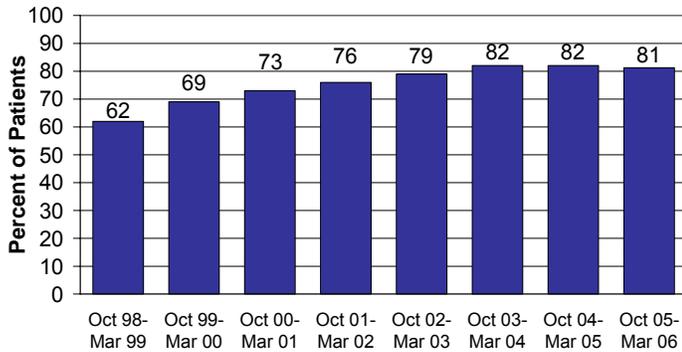
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 7: Distribution of mean hemoglobin values for adult in-center hemodialysis patients, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



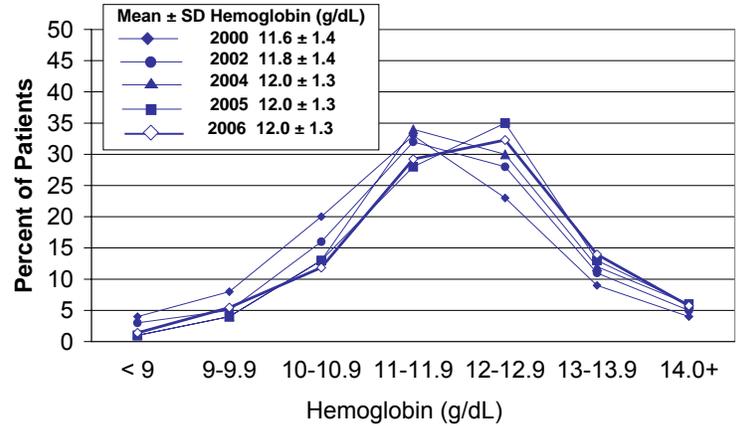
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 8: Percent of adult peritoneal dialysis patients with mean hemoglobin ≥ 11 g/dL, October 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 9: Distribution of mean hemoglobin values for adult peritoneal dialysis patients, October 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Pediatric Dialysis Trends

Figure 10: Distribution of mean delivered, calculated, single session spKt/V values for pediatric (aged < 18 years) in-center hemodialysis patients, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.

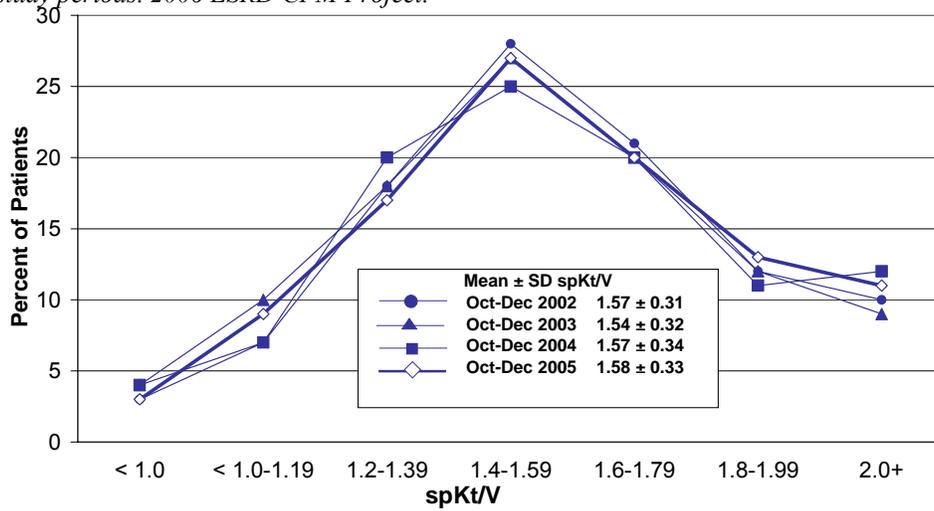
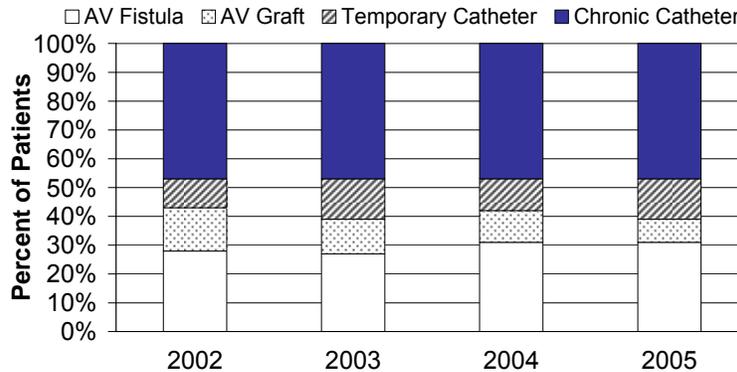
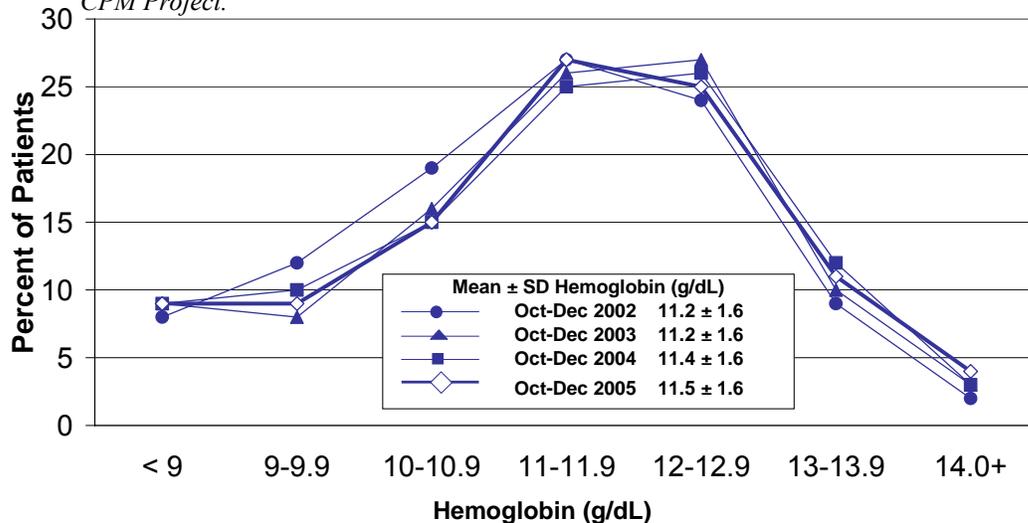


Figure 11: Vascular access type for pediatric (aged < 18 years) in-center hemodialysis patients on their last hemodialysis session during the study period. 2006 ESRD CPM Project.



*Chronic catheter use defined as continuous catheter use 90 days or longer.

Figure 12: Distribution of mean hemoglobin values for pediatric (aged < 18 years) in-center hemodialysis patients, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

SELECTED SIGNIFICANT FINDINGS FROM THE NATIONAL 2006 ESRD CPM PROJECT**Random Sample of Adult In-Center Hemodialysis (HD) Patients (n=8,609 sample for analysis)
Data from OCT-DEC 2005.****HD Adequacy**

- 91% of prevalent patients had a mean delivered, calculated, single-session adequacy dose of spKt/V \geq 1.2 (FIGURE 5)
- 94% of female patients and 88% of male patients were receiving dialysis with a mean delivered, calculated, single-session spKt/V \geq 1.2 in OCT-DEC 2005 (TABLE 7)
- Mean \pm SD spKt/V was 1.6 ± 0.3 (FIGURE 13)
- 88% of patients had a mean URR \geq 65% (APPENDIX 6)
- Mean \pm SD URR was $72 \pm 7\%$ (APPENDIX 7)
- Mean \pm SD dialysis session length was 216 ± 31 minutes (FIGURE 18)

Opportunity to Improve Adequacy

- 9% of patients did not have a mean spKt/V \geq 1.2 during the three-month study period (TABLE 7)

Vascular Access

- 54% of incident and 44% of prevalent patients dialyzed with an AVF during their last hemodialysis session of the data collection period OCT-DEC 2005 (FIGURE 28, TABLE 9)
- 69% of patients with an AVF or AV graft had their access routinely monitored for the presence of stenosis during the three-month study period (APPENDIX 6)

Opportunities to Improve Vascular Access

- 46% of incident patients and 56% of all patients were not dialyzed with an AVF during their last hemodialysis session OCT-DEC 2005 (FIGURE 28, TABLE 9)
- 31% of patients with an AVF or AV graft did not have their access routinely monitored for the presence of stenosis during the three-month study period (APPENDIX 6)

Anemia Management (AM)

- 84% of patients had a mean hemoglobin \geq 11 g/dL (110 g/L) in the last quarter of 2005 (FIGURE 6)

- 5% of patients had a mean hemoglobin $<$ 10.0 g/dL (100 g/L) (TABLE 14)
- Mean \pm SD hemoglobin was 12.0 ± 1.2 g/dL (119 ± 12 g/L) (FIGURE 7)
- 78% of patients had a mean transferrin saturation \geq 20% (FIGURE 35, TABLE 16)
- 95% of patients had a mean serum ferritin concentration \geq 100 ng/mL (FIGURE 35, TABLE 16)
- 24% of patients had a mean serum ferritin $>$ 800 ng/mL (FIGURE 35, TABLE 16)
- 69% of patients were prescribed IV iron during the study period (FIGURE 35, TABLE 16)

Opportunities to Improve Anemia Management

- 16% of patients did not have a mean hemoglobin \geq 11 g/dL (110 g/L) during the three-month study period (FIGURE 6)
- 22% of patients did not have a mean transferrin saturation \geq 20% and 5% of patients did not have a mean serum ferritin \geq 100 ng/mL (FIGURE 35, TABLE 16)

Serum Albumin

- 33% of patients had a mean serum albumin \geq 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP)¹ (FIGURE 40, TABLE 17)
- 80% of patients had a mean serum albumin \geq 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) (FIGURE 40, TABLE 17)
- Mean \pm SD serum albumin was $3.8 \pm 0.4/3.4 \pm 0.5$ g/dL ($38 \pm 4/34 \pm 5$ g/L) (BCG/BCP) (FIGURE 36)

Opportunity to Improve Serum Albumin

- 67% of patients did not have a mean serum albumin \geq 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) during the three-month study period (FIGURE 40, TABLE 17)

¹BCG = bromocresol green, BCP = bromocresol purple; these are two different laboratory methods for assaying serum albumin.

SELECTED SIGNIFICANT FINDINGS FROM THE NATIONAL 2006 ESRD CPM PROJECT

Random Sample of Adult Peritoneal Dialysis (PD) Patients (n=1,409 sample for analysis) The data are from OCT 2005–MAR 2006:

PD Adequacy

- Mean weekly Kt/V_{urea} for CAPD patients was 2.33 ± 0.61 (APPENDIX 8)
- Mean weekly Kt/V_{urea} for Cycler patients was 2.26 ± 0.62 (TABLE 21)

Opportunities to Improve Adequacy

- The adequacy of dialysis was not assessed during the 2006 study period for 20% of the sampled peritoneal dialysis patients (APPENDIX 8)
- 31% of CAPD patients did not achieve an adequate weekly Kt/V_{urea} and 41% did not achieve an adequate weekly CrCl. (APPENDIX 8) Likewise, 43% of cycler patients did not achieve an adequate weekly Kt/V_{urea} and 52% did not achieve an adequate weekly CrCl (TABLE 21)

Anemia Management (AM)

- 81% of patients had a mean hemoglobin ≥ 11 g/dL (FIGURES 8, 43)
- 85% of patients had a mean transferrin saturation $\geq 20\%$ (FIGURE 44)
- 88% of patients had a mean serum ferritin concentration ≥ 100 ng/mL (FIGURE 44)
- Mean \pm SD hemoglobin was 12.0 ± 1.3 g/dL (120 ± 13 g/L) (FIGURES 9, 42, TABLE 22)

- 16% of patients had a mean serum ferritin > 800 ng/mL (FIGURE 44)

Opportunities to Improve Anemia Management

- 19% of patients did not have a mean hemoglobin ≥ 11 g/dL (110 g/L) in the 2006 study period (FIGURES 8, 43)
- 15% of patients did not have a mean transferrin saturation $\geq 20\%$ and 12% of patients did not have a mean serum ferritin ≥ 100 ng/mL in the 2006 study period (FIGURE 44)

Serum Albumin

- 19% of patients had a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP)¹ (FIGURE 45, TABLE 23)
- 62% of patients had a mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) (FIGURE 45, TABLE 23)
- Mean \pm SD serum albumin was $3.6 \pm 0.5/3.3 \pm 0.6$ g/dL ($36 \pm 5/33 \pm 6$ g/L) (BCG/BCP) (APPENDIX 8)

Opportunities to Improve Serum Albumin

- 81% of PD patients did not have mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) during the six-month study period (FIGURE 45, TABLE 23)
- 38% of PD patients did not have mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) during the six-month study period (FIGURE 45, TABLE 23)

¹BCG = bromcresol green, BCP = bromcresol purple; these are two different laboratory methods for assaying serum albumin. Using the 1997 NKF-DOQI guidelines (14): For cycler patients; weekly $Kt/V_{\text{urea}} \geq 2.1$; weekly CrCl ≥ 66 L/week/1.73m²

SELECTED SIGNIFICANT FINDINGS FROM THE NATIONAL 2006 ESRD CPM PROJECT**100% Sample Pediatric In-Center Hemodialysis Patients (HD) (aged < 18 years) (n=743 sample for analysis)
The data are from OCT–DEC 2005:****Clearance**

- 88% of patients had a mean delivered, calculated, single-session adequacy dose of spKt/V ≥ 1.2 calculated using the Daugirdas II formula (26) (TABLE 24)
- Mean \pm SD spKt/V was 1.58 ± 0.33 (FIGURES 10, 46)
- Mean \pm SD dialysis session length was 202 ± 33 minutes

Opportunity to Improve Clearance

- 12% of patients did not have a mean spKt/V ≥ 1.2 during the three-month study period (TABLE 24)

Vascular Access

- 31% of patients were dialyzed using an AV fistula (AVF) (FIGURE 11, TABLE 25)
- 47% of patients were dialyzed with a chronic catheter continuously for 90 days or longer (FIGURE 11)
- 58% of patients with an AVF or an AV graft had their access routinely monitored for the presence of stenosis

Opportunity to Improve Vascular Access

- 42% of patients with an AVF or AV graft did not have this access routinely monitored for the presence of stenosis during the three-month study period

Anemia Management

- 68% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L)

- Mean \pm SD hemoglobin was 11.5 ± 1.6 g/dL (115 ± 16) g/L (FIGURES 12, TABLE 27)
- 74% of patients had a mean transferrin saturation $\geq 20\%$ (FIGURE 55)
- 83% of patients had a mean serum ferritin concentration ≥ 100 ng/mL (FIGURE 55)
- 17% of patients had a mean serum ferritin > 800 ng/mL (FIGURE 55)

Opportunity to Improve Anemia Management

- 32% of patients did not have a mean hemoglobin ≥ 11 g/dL (110 g/L) during the three-month study period (FIGURES 52, 53, 54)

Serum Albumin

- 44% of patients had a mean serum albumin $\geq 4.0/3.7$ g/dL ($40/37$ g/L) (BCG/BCP)¹ (FIGURE 56, TABLE 28)
- 80% of patients had a mean serum albumin $\geq 3.5/3.2$ g/dL ($35/32$ g/L) (BCG/BCP) (FIGURE 56, TABLE 28)
- Mean \pm SD serum albumin was $3.9 \pm 0.5 / 3.5 \pm 0.5$ g/dL ($39 \pm 5/35 \pm 5$ g/L) (BCG/BCP)

Opportunity to Improve Serum Albumin

- 56% of patients did not have a mean serum albumin $\geq 4.0/3.7$ g/dL ($40/37$ g/L) (BCG/BCP) during the three-month study period (FIGURE 56, TABLE 28)

¹BCG = bromcresol green, BCP = bromcresol purple; these are two different laboratory methods for assaying serum albumin.

SELECTED SIGNIFICANT FINDINGS FROM THE NATIONAL 2006 ESRD CPM PROJECT

100% Sample Pediatric Peritoneal Dialysis Patients (PD) (aged < 18 years) (n=781 sample for analysis) The data are from OCT 2005 – MAR 2006:

Clearance

- 71% of cycler patients had a mean weekly $Kt/V_{urea} \geq 2.1$ (TABLE 29)
- Mean weekly Kt/V_{urea} for cycler patients was 2.53 ± 0.77 (TABLE 29)

Opportunities to Improve Clearance

- 29% of cycler patients did not have a mean weekly $Kt/V_{urea} \geq 2.1$ during the six-month study period

Anemia Management

- 71% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L) (TABLE 31, FIGURES 58, 59)
- Mean \pm SD hemoglobin was 11.6 ± 1.5 g/dL (116 ± 15 g/L)
- 78% of patients had a mean transferrin saturation $\geq 20\%$
- 72% of patients had a mean serum ferritin concentration ≥ 100 ng/mL

Opportunity to improve Anemia Management

- 29% of patients did not have a mean hemoglobin ≥ 11 g/dL (110 g/L) during the six-month study period

Serum Albumin

- 26% of patients had a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) (TABLE 32)
- 63% of patients had a mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) (TABLE 32)
- Mean serum albumin was $3.6 \pm 0.6/3.4 \pm 0.5$ g/dL ($37 \pm 6/34 \pm 6$ g/L) (BCG/BCP)

Opportunity to Improve Serum Albumin

- 74% of patients did not have a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) during the six-month study period

IMPORTANT NOTE

The data in this Report are intended to stimulate the development of quality improvement (QI) projects in dialysis facilities. The data collected for this project were necessarily limited: not all dialytic parameters that influence patient care for these clinical measures were collected. In addition, the project did not attempt to develop facility-specific profiles of care.

As you review this Report, ask yourself questions about how your patients' clinical characteristics compare to these national hemodialysis and peritoneal dialysis patient profiles and Network hemodialysis patient profiles. Additional information must be collected at your facility if you wish to answer these questions and develop ways to improve patient care for your patients. Your ESRD Network staff and Medical Review Board members are available to assist you in using these data in your QI activities and in developing facility-specific QI projects.

V. ADULT IN-CENTER HEMODIALYSIS PATIENTS

This section describes selected CPM and other quality indicators for the sampled adult in-center hemodialysis patients related to adequacy of dialysis, vascular access, anemia management and serum albumin. Each of these subsections is further divided into three parts:

- (1) National findings for selected CPMs for October–December 2005 (the serum albumin information is not considered a CPM for this report);
- (2) A description of other quality indicators or data analyses for October–December 2005; and
- (3) A comparison of CPM and/or other quality indicators results or findings for October–December 2005 and previous study periods.

A national random sample of adult (≥ 18 years) in-center hemodialysis patients, stratified by Network, who were alive on December 31, 2005, was selected ($n=8,915$). 8,609 patients (97%) were included in the sample for analysis.

A. ADEQUACY OF HEMODIALYSIS

1. CPM Findings for October–December 2005

The data for three hemodialysis adequacy CPMs included in this section (Hemodialysis Adequacy CPM I–III) were collected in 2006. The time period from which these data were abstracted was October–December 2005.

Hemodialysis Adequacy CPM I — The patient's delivered dose of hemodialysis is measured at least once per month.

FINDING: 81% of adult in-center hemodialysis patients in the sample for analysis had documented measurements of hemodialysis adequacy (URR and/or spKt/V) for each month during the three-month study period (October–December 2005). These measurements were recorded in the patient's chart, not calculated from individual data points. An additional 13% of the patients in the sample for analysis had documented adequacy measurements for two out of the three months, and another 5% of the patients had documented adequacy measurements for one of the three months.

Hemodialysis Adequacy CPM II — The patient's delivered dose of hemodialysis recorded in the patient's chart is calculated by using formal urea kinetic modeling (UKM) or the Daugirdas II formula (for spKt/V) (26).

FINDING: 76% of adult in-center hemodialysis patients in the sample for analysis had delivered hemodialysis doses reported as spKt/V calculated using formal UKM or the Daugirdas II formula.

Hemodialysis Adequacy CPM III — The patient's delivered dose of hemodialysis calculated from data points on the data collection form (monthly measurement averaged over the three-month study period) is $\text{spKt/V} \geq 1.2$ using the Daugirdas II formula (26). This CPM is calculated on the subset of patients who had been on hemodialysis therapy for six months or longer and who were dialyzing three times per week ($n=6,604$).

FINDING: For the last quarter of 2005, 94% of the adult in-center hemodialysis patients who met the inclusion criteria (only those patients who had been on hemodialysis therapy for six months or longer and who were dialyzing three times per week [$n=6,604$]) had a mean delivered, calculated, single-session (hereafter referred to as delivered) hemodialysis dose of $\text{spKt/V} \geq 1.2$.

2. Other Hemodialysis Adequacy Findings for October–December 2005

NOTE: The following findings apply to all adult in-center hemodialysis patients in the sample for analysis regardless of when they first initiated dialysis. Only 0.8% ($n=67$) of patients were dialyzed more than three times per week over the study period; these patients were included in the following hemodialysis adequacy findings.

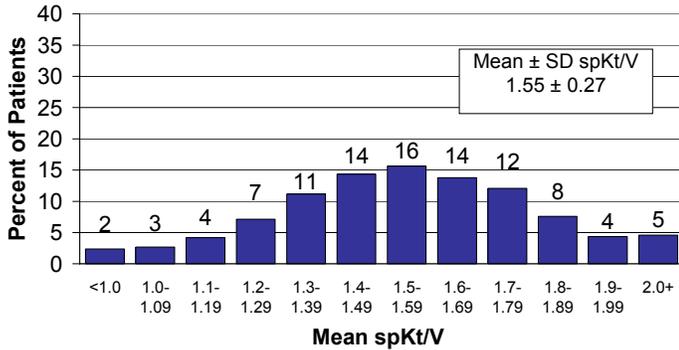
The mean \pm SD delivered calculated spKt/V of all adult in-center hemodialysis patients in the sample for analysis in the last quarter of 2005 was 1.55 ± 0.27 . The distribution of spKt/V values for these patients is shown in Figure 13. The mean \pm SD delivered calculated URR for this sample was $72 \pm 7\%$. 88% of patients had a mean delivered URR $\geq 65\%$. The mean delivered spKt/V and the percentages of patients with mean delivered spKt/V ≥ 1.2 and spKt/V ≥ 1.3 for gender, race, ethnicity, age, diagnosis, duration of dialysis, quintile of post-dialysis body weight, access type, and selected clinical parameters are shown in Table 7.

The percentage of patients in the sample for analysis with at least one calculated spKt/V measure available ($n=8,301$) who received adequate hemodialysis, defined as a mean delivered spKt/V ≥ 1.2 , approximately equivalent to URR $\geq 65\%$ (2), in the last quarter of 2005 was 91% (TABLE 7).

The percentage of patients receiving hemodialysis with a mean delivered spKt/V ≥ 1.2 was higher for women than for men, higher for Hispanics compared to non-Hispanics, higher for patients dialyzing six months or longer than for patients dialyzing less than six months, higher for patients in lower quintiles of body weight, and higher for patients ≥ 65 years of age than for younger patients. Whites and Blacks had the same rate of delivered Kt/V ≥ 1.2 , while American Indians/Alaska Natives and Asians/Pacific Islanders had higher rates. Those of other or unknown race had a lower percent receiving delivered dialysis with Kt/V ≥ 1.2 (TABLE 7).

A higher percentage of patients with mean hemoglobin ≥ 11 g/dL (110 g/L) and mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) had a mean spKt/V ≥ 1.2 compared to patients with lower mean hemoglobin and serum albumin values. A higher percentage of patients dialyzing with an AV fistula, an AV graft, or graft without AVF had a mean delivered spKt/V ≥ 1.2 compared to patients dialyzing with a catheter (93%, 97% and 96% vs. 81%, respectively) (TABLE 7).

Figure 13: Distribution of mean delivered, calculated, single session spKt/V values for adult in-center hemodialysis patients, October–December 2005. 2006 ESRD CPM Project.



The mean \pm SD dialysis session length was 216 ± 31 minutes (FIGURE 18). The mean dialysis session length was somewhat longer for men than for women (223 minutes vs. 208 minutes), for Blacks than for Whites (222 minutes vs. 213 minutes), and for patients dialyzing six months or longer compared to patients dialyzing less than six months (217 minutes vs. 212 minutes). Patients in the highest quintile of post-dialysis body weight (kg) had longer dialysis session lengths compared to patients in the lowest quintile (236 minutes vs. 198 minutes). The mean dialysis session length was 218 minutes for patients dialyzing with an AVF, 213 minutes for graft with an AVF, 214 minutes for graft without an AVF, and 216 minutes for patients with a catheter access.

The percentage of patients who received adequate hemodialysis varied significantly from one geographic region to another. Table 8 shows, by gender, race, ethnicity, post-dialysis body weight, and dialysis session length the percentage of patients who received hemodialysis with a mean delivered spKt/V ≥ 1.2 in each Network area. The percentage of all patients with mean delivered spKt/V ≥ 1.2 ranged from 88% to 93% among the 18 Networks (FIGURES 14, 15).

Figure 14: Percent of adult in-center hemodialysis patients receiving dialysis with a mean delivered, calculated single session spKt/V ≥ 1.2 , by Network, October–December 2005. 2006 ESRD CPM Project.

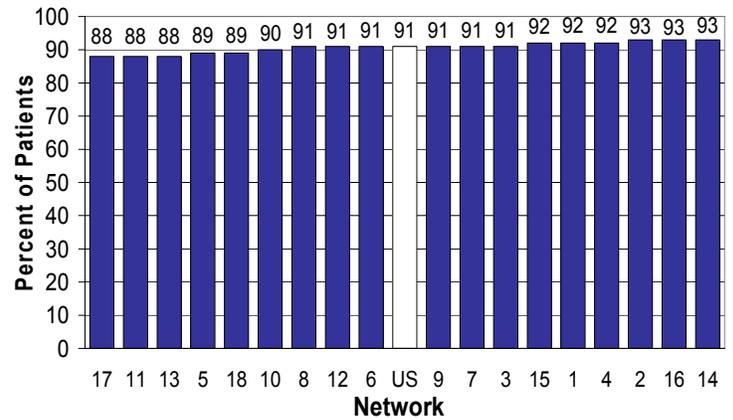


Figure 15: Percent of adult in-center hemodialysis patients receiving dialysis with a mean delivered, calculated single session spKt/V ≥ 1.2 , by Network, October–December 2005. 2006 ESRD CPM Project.

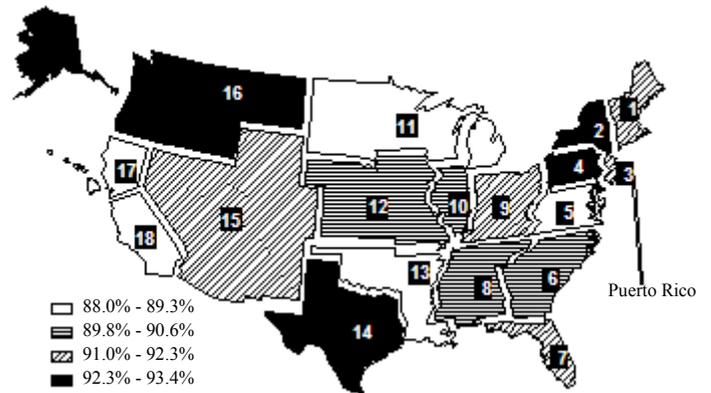


TABLE 7: Mean delivered calculated, single session spKt/V and percent of adult in-center hemodialysis patients with mean delivered calculated, single session spKt/V ≥ 1.2 and ≥ 1.3 by patient characteristics, October-December 2005. 2006 ESRD CPM Project.

Patient Characteristics	Mean spKt/v	Percent of Patients with	
		spKt/V $\geq 1.2\%$	spKt/V $\geq 1.3\%$
ALL	1.55	91	84
GENDER			
Men	1.49	88	79
Women	1.62	94	89
RACE			
American Indian/Alaska Native	1.66	92	85
Asian/Pacific Islander	1.66	95	91
Black or African American	1.53	91	83
White	1.55	91	84
Other/Unknown	1.54	87	77
ETHNICITY			
Hispanic	1.60	92	87
Non-Hispanic	1.54	91	83
AGE GROUP (years)			
18-44	1.52	88	80
45-54	1.51	88	81
55-64	1.52	88	80
65-74	1.57	93	87
75+	1.61	95	90
CAUSE OF ESRD			
Diabetes Mellitus	1.53	90	82
Glomerulonephritis	1.55	89	83
Hypertension	1.57	92	85
Other/Unknown	1.57	92	85
DURATION OF DIALYSIS (years)			
< 0.5	1.39	73	59
0.5-0.9	1.50	88	78
1.0-1.9	1.57	93	86
2.0-2.9	1.58	94	87
3.0-3.9	1.58	94	88
4.0+	1.60	95	90
QUINTILE POSE-DIALYSIS BODY WEIGHT (kg)			
32.0 - 60.0	1.72	97	94
60.1 - 69.9	1.61	95	92
70.0 - 79.7	1.54	92	85
79.8 - 94.3	1.49	89	79
94.4 - 226.0	1.39	81	68
ACCESS TYPE			
AV Fistula	1.57	93	86
Graft with AVF	1.61	97	91
Graft without AVF	1.62	96	92
Catheter	1.45	81	70
MEAN Hgb (g/dL)			
≥ 11	1.56	92	85
< 11	1.49	83	75
MEAN SERUM ALBUMIN (g/dL)			
$\geq 3.5/3.2$ BCG/BCP [^]	1.56	92	85
< 3.5/3.2 BCG/BCP [^]	1.50	86	77

[^] BCG/BCP = bromocresol green/bromocresol purple laboratory methods.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

TABLE 8: Percent of adult in-center hemodialysis patients receiving dialysis with a mean delivered, single session $spKt/V \geq 1.2$, by gender, race, ethnicity, body weight, dialysis session length and Network, October-December 2005. 2006 ESRD CPM Project.

PATIENT CHARACTERISTIC	NETWORK																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
ALL	92	93	91	92	89	91	91	91	91	90	88	91	88	93	92	93	88	89	91
GENDER																			
Men	89	94	88	91	85	87	89	88	87	88	82	89	85	90	90	90	84	85	88
Women	96	92	96	94	93	95	93	93	96	92	95	93	91	97	95	97	92	95	94
RACE																			
Black	92	95	91	89	88	92	93	90	91	89	84	91	89	90	86	94	90	96	91
White	93	90	91	94	90	90	89	91	91	90	90	91	86	95	92	93	84	88	91
ETHNICITY																			
Hispanic	96	95	91	*	*	75	91	*	*	96	93	*	*	95	93	90	93	89	92
Non-Hispanic	92	93	91	92	89	91	91	90	91	89	88	91	88	92	92	93	87	90	91
POST-DIALYSIS BODY WEIGHT[^]																			
< 74.83	97	96	95	95	96	94	97	95	96	95	95	97	95	97	96	97	94	95	96
≥ 74.83	87	89	86	90	83	87	85	86	87	86	82	85	83	90	88	89	80	83	86
DIALYSIS SESSION LENGTH[^]																			
< 212.67	92	90	91	88	87	89	91	88	86	89	88	90	87	90	90	95	86	89	89
≥ 212.67	93	97	91	95	91	92	91	92	95	90	89	91	89	95	94	92	94	91	93

* value suppressed because n<11

[^] post-dialysis body weight (kg) and dialysis session length categories were created at the median value for the study period

Note: A delivered $spKt/V$ of 1.2 does not necessarily correlated with a delivered URR of 65%.

3. CPM and other Findings for October-December 2005 compared to previous study periods

Note: The following findings apply to all adult in-center hemodialysis patients in the sample for analysis regardless of when they first initiated dialysis.

The mean ± SD delivered spKt/V in October-December 2005 was 1.55 ± 0.26, an increase from previous study years. The percentage of patients receiving dialysis with a mean delivered spKt/V ≥ 1.2 increased significantly from 86% in late 2000 to 91% in late 2005 (FIGURE 5). This significant improvement occurred for both men and women, and for both White and Black patients (FIGURES 16, 17).

Figure 16: Percent of adult male in-center hemodialysis patients with mean delivered, single session spKt/V ≥ 1.2, by race, October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.

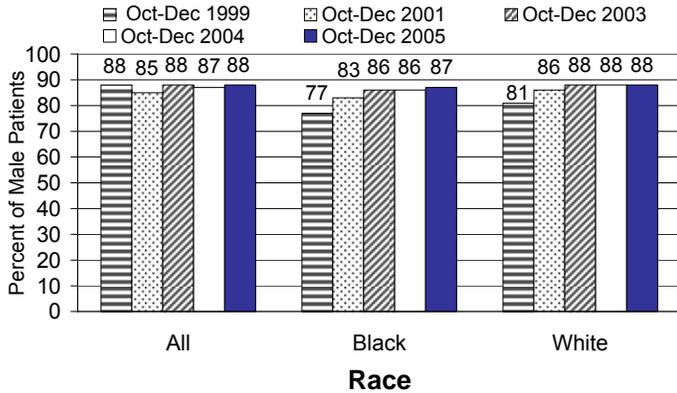


Figure 17: Percent of adult female in-center hemodialysis patients with mean delivered, single session spKt/V ≥ 1.2, by race, October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.

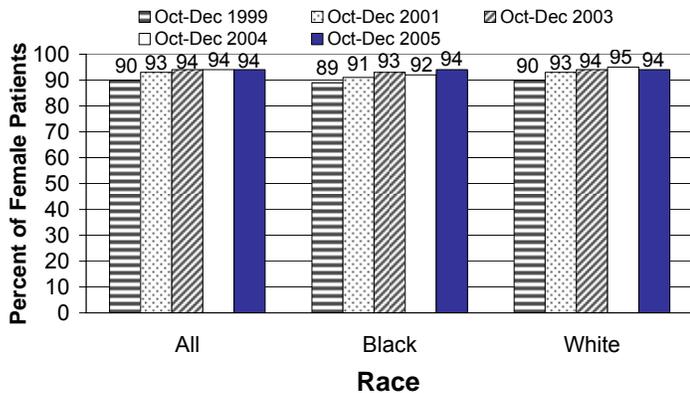
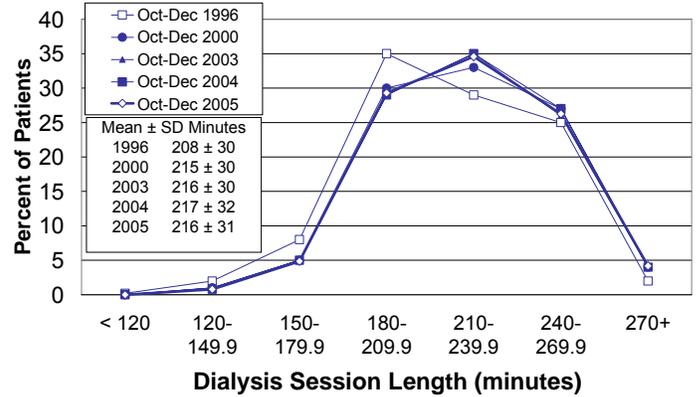


Figure 18 shows a trend for slight increases in dialysis session lengths from late 1996 to late 2005.

Figure 18: Distribution of mean dialysis session length (minutes), October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.



B. VASCULAR ACCESS

1. CPM Findings for October-December 2005

Data to assess three vascular access CPMs included in this report were collected in 2006. The time period from which these data were abstracted was October–December 2005.

Vascular Access CPM I — A primary arteriovenous fistula (AVF) should be the access for at least 50% of all new patients initiating hemodialysis. A native AVF should be the primary access for 40% of all prevalent patients undergoing hemodialysis.

FINDING: 54% of incident patients (initiating their most recent course of hemodialysis on or between January 1, 2005 and August 31, 2005 [n = 1,362]) were dialyzed using an AVF on their last hemodialysis session during October–December 2005 (TABLE 9).

44% of all prevalent patients in the sample for analysis were dialyzed using an AVF during their last hemodialysis session October–December 2005 (TABLE 9).

TABLE 9: Vascular access type for incident[^] and all adult in-center hemodialysis patients during the last hemodialysis session of the study period, by selected patient characteristics, October-December 2005. 2006 ESRD CPM Project.

Patient Characteristic	Incident (n=1,362)				Prevalent (n=8,609)			
	AVF %	Graft w/ AVF %	Graft w/o AVF %	Catheter %	AVF %	Graft w/ AVF %	Graft w/o AVF %	Catheter %
Total	54	*	10	36	44	3	26	27
GENDER								
Men	59	*	7	33	53	2	21	24
Women	46	*	14	40	33	3	32	32
RACE								
American Indian/Alaska Native	61	*	*	*	53	*	22	22
Asian/Pacific Islander	58	*	*	37	47	4	26	23
Black or African American	50	*	14	35	38	3	34	25
White	55	*	8	37	47	2	21	29
Other/Unknown	*	*	*	*	49	*	19	29
ETHNICITY								
Hispanic	63	*	6	31	51	4	22	23
Non-Hispanic	52	*	11	37	42	2	27	28
AGE GROUP (years)								
18-44	51	*	6	41	52	3	20	25
45-54	59	*	9	33	45	3	26	26
55-64	55	*	10	34	44	3	26	27
65-74	54	*	12	34	41	2	30	27
75+	50	*	11	39	40	2	27	31
CAUSE OF ESRD								
Diabetes Mellitus	55	*	11	34	41	3	28	28
Hypertension	51	*	13	36	44	2	28	25
Glomerulonephritis	62	*	*	32	52	3	23	23
Other/Unknown	51	*	6	42	44	3	22	32
DURATION OF DIALYSIS (years)								
< 0.5	47	*	7	47	26	*	8	66
0.5-0.9	56	*	11	33	56	*	11	33
1.0-1.9	N/A	N/A	N/A	N/A	48	3	26	24
2.0-2.9	N/A	N/A	N/A	N/A	47	2	29	21
3.0-3.9	N/A	N/A	N/A	N/A	44	3	33	20
4.0+	N/A	N/A	N/A	N/A	43	4	36	18

[^]An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005.

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

*Value suppressed because n < 11.

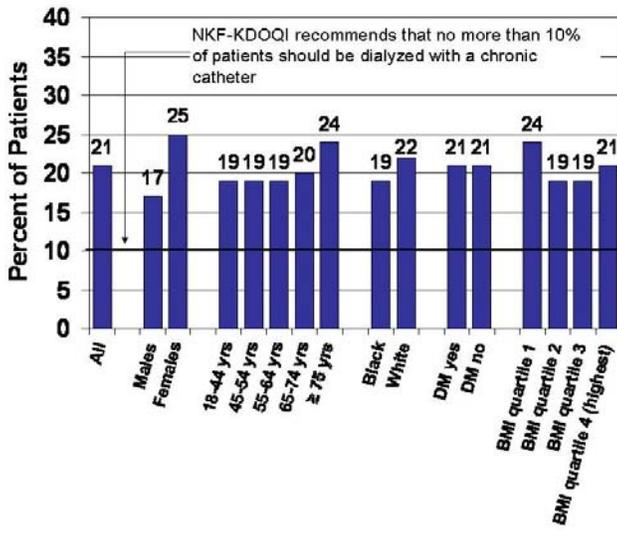
Vascular Access CPM II — Less than 10% of chronic maintenance hemodialysis patients should be maintained on catheters (continuously for 90 days or longer) as their permanent chronic dialysis access.

FINDING: 21% of all patients in the sample for analysis were dialyzed with a chronic catheter continuously for 90 days or longer during October–December 2005 (FIGURE 19).

Vascular Access CPM III — A patient’s AV graft should be routinely monitored for stenosis. (See Vascular Access CPM III in Appendix 1 for a list of techniques and frequency of monitoring used to screen for the presence of stenosis).

FINDING: 69% of patients with an AV graft (n=2,385) had this graft routinely monitored for the presence of stenosis during October–December 2005.

Figure 19: Percent of all adult in-center hemodialysis patients dialyzed with a catheter continuously for 90 days or longer as their vascular access on their last hemodialysis session during October-December 2005, by patient characteristics. 2006 ESRD CPM Project.



Post-dialysis BMI quartiles: 1) <22.7, 2) 22.7-26.4, 3) 26.5-31.3, 4) >31.3

2. Other Vascular Access Findings for October-December 2005

Among prevalent patients, males, Whites, American Indian/Alaska Natives, unknown/other races, Hispanics, patients 18-44 years old, patients with causes of ESRD other than diabetes mellitus, and patients dialyzing six months or longer were more likely to be dialyzed with an AVF compared to women, Blacks, non-Hispanics, patients older than 44 years, patients with diabetes mellitus as the cause of ESRD, and patients dialyzing less than six months (TABLE 9). Many patient groups examined did not meet

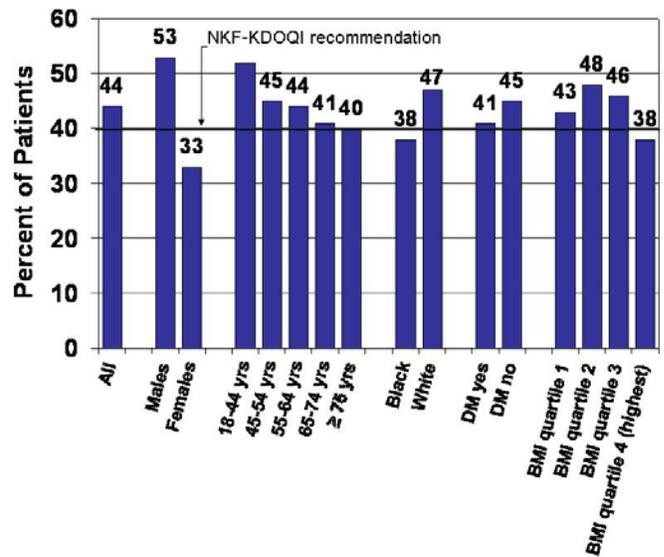
the current NKF-KDOQI recommendation of 40% of prevalent patients having an AVF as their vascular access (4) (TABLE 9 and 10, FIGURE 20). The percentage of prevalent patients with a catheter as their vascular access, by several patient characteristics, is shown in Table 9 and Figure 21. More women, Whites, American Indian/Alaska Natives, unknown/other races, and patients ≥ 75 years old, had a catheter access compared to men, Blacks, and younger patients.

More women were dialyzed with a catheter for 90 days or longer compared to men (FIGURE 19). None of the patient groups examined met the current NKF-KDOQI recommendation of less than 10% of chronic hemodialysis patients with a catheter as their vascular access (4).

There was wide geographic variation in the percentage of all patients dialyzing with an AVF; the percentage ranged from 36% to 58% among the 18 Network areas (FIGURE 22, TABLE 10). This geographic variation in AVF use was also noted for incident patients, ranging from 45% to 66% among the 18 Network areas (FIGURE 23).

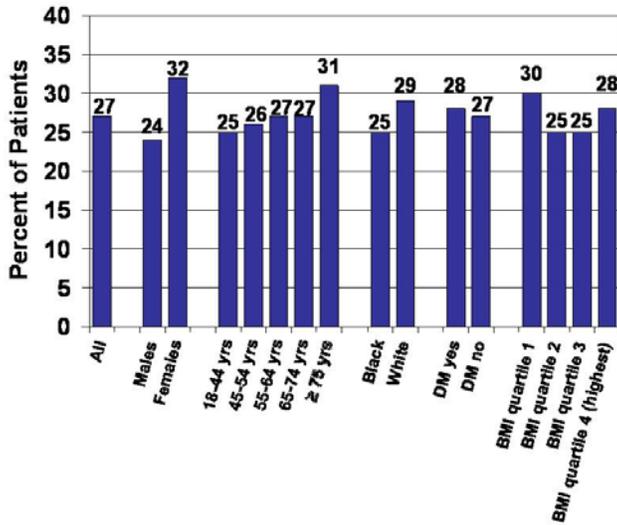
The percentage of patients dialyzed with a catheter exhibited geographic variation, ranging from 22% to 35% among the 18 Network areas (FIGURE 24, TABLE 11). Chronic catheter use (90 days or more) was 21% nationally, and ranged from 17% to 29% across the 18 Network areas (FIGURE 25).

Figure 20: Percent of all adult in-center hemodialysis patients dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October-December 2005, by patient characteristics. 2006 ESRD CPM Project.



Post-dialysis BMI quartiles: 1) <22.7, 2) 22.7-26.4, 3) 26.5-31.3, 4) >31.3

Figure 21: Percent of all adult in-center hemodialysis patients dialyzed with a catheter as their vascular access on their last hemodialysis session during October–December 2005, by patient characteristics. 2006 ESRD CPM Project.



Post-dialysis BMI quartiles: 1) <22.7, 2) 22.7-26.4, 3) 26.5-31.3, 4) >31.3

Figure 22: Percent of all adult in-center hemodialysis patients dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.

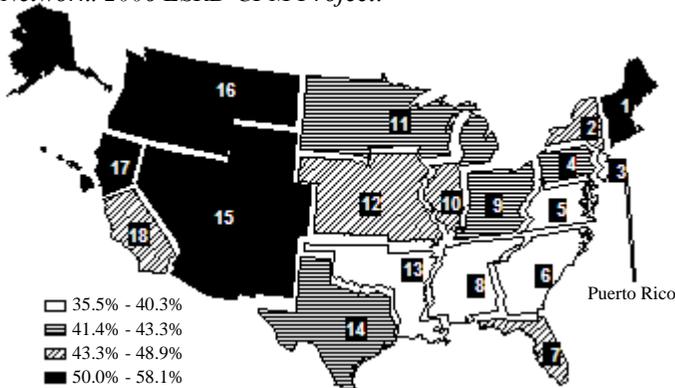
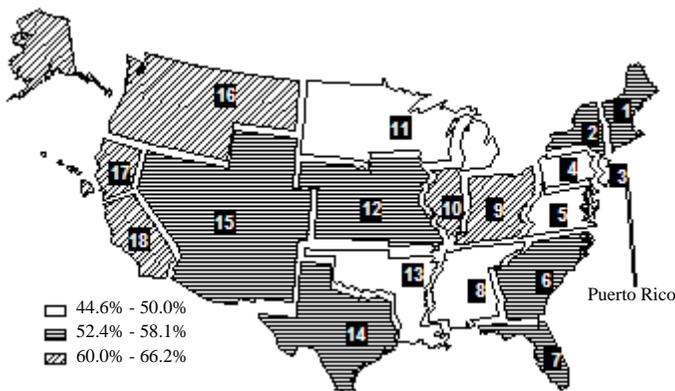


Figure 23: Percent of incident* adult in-center hemodialysis patients dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.



*An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005.

Figure 24: Percent of all adult in-center hemodialysis patients dialyzed with a catheter as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.

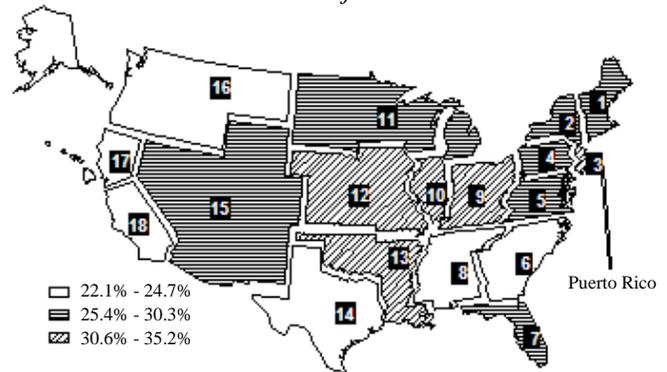
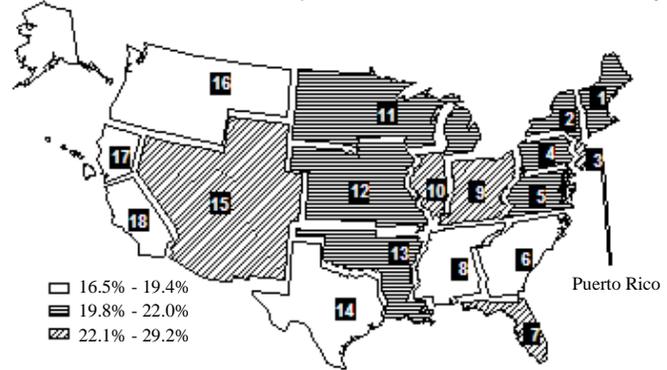


Figure 25: Percent of all adult in-center hemodialysis patients dialyzed with a catheter continuously for 90 days or longer as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.



27% (n=2,373) of all patients in the sample for analysis were dialyzed with a catheter during their last hemodialysis session of the study period (TABLES 9, 11). The most common reasons for catheter placement were: no fistula or graft surgically planned (19%), the fistula was maturing, not ready to cannulate (21%), and no fistula or graft surgically created at this time (19%) (TABLE 12). 18% of patients were not candidates for fistula or graft placement as all sites had been exhausted.

Sixty nine percent of patients with an AVF or AV graft (n=6,167) had their vascular access monitored for stenosis during the study period. For this subset of patients, 48% were monitored with dynamic venous pressure, 8% with static venous pressure, 7% with the dilution technique, 3% (with Color-flow Doppler, and 20% with “Other” techniques (groups not mutually exclusive).

18% of incident patients had an AVF as their vascular access upon initiation of maintenance hemodialysis; 31% of incident patients had an AVF as their vascular access 90 days later (FIGURE 26). 71% of incident patients had a catheter as their vascular access upon initiation of maintenance hemodialysis; 53% of incident patients had a catheter as their vascular access 90 days later (FIGURE 26).

Table 10: Percent of all adult in-center hemodialysis patients with an AV fistula access on their last hemodialysis session during October-December 2005, by gender, race, ethnicity, age, cause of ESRD, and Network, 2006 ESRD CPM Project

PATIENT CHARACTERISTIC	NETWORK																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
ALL	51	48	39	42	36	40	43	36	42	45	41	43	39	43	51	58	50	49	44
GENDER																			
Men	60	57	43	50	47	50	53	46	54	57	50	56	48	52	56	66	53	58	53
Women	38	36	33	33	22	30	32	25	30	33	32	29	30	34	45	49	46	36	33
RACE																			
Black	41	47	37	38	32	42	39	35	43	39	33	39	34	34	43	53	41	33	38
White	53	48	40	45	38	38	47	38	41	51	46	45	42	47	52	57	58	52	47
ETHNICITY																			
Hispanic	48	59	42	*	*	41	44	*	*	57	*	*	*	44	66	*	64	55	51
Non-Hispanic	51	46	38	42	35	40	43	36	42	44	42	43	39	43	46	58	46	44	42
AGE GROUP (years)																			
18-44	52	68	55	47	41	58	43	43	49	51	47	60	41	50	60	66	60	53	52
45-54	51	49	41	40	39	30	45	32	47	46	45	48	48	58	56	61	50	48	45
55-64	57	46	29	43	40	44	48	38	40	43	39	51	38	39	50	54	52	54	44
65-74	53	45	41	43	26	33	40	34	44	50	33	37	34	35	52	61	50	50	41
75+	45	40	37	41	33	37	41	34	36	40	45	34	34	39	44	53	43	41	40
CAUSE OF ESRD																			
Diabetes Mellitus	52	49	32	40	31	37	37	32	35	44	35	39	38	43	52	59	44	52	41
Other Causes Combined	50	47	45	44	38	42	48	39	48	46	46	48	40	43	51	58	55	46	45

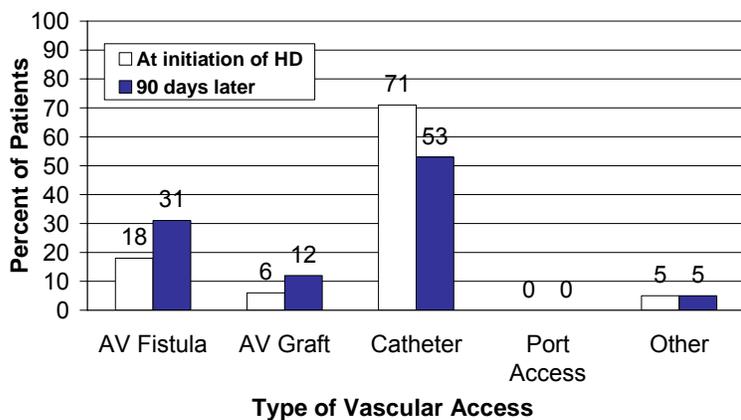
* value suppressed because n<11

Table 11: Percent of all adult in-center hemodialysis patients with a catheter access on their last hemodialysis session during October-December 2005, by gender, race, ethnicity, age, cause of ESRD, and Network. 2006 ESRD CPM Project.

PATIENT CHARACTERISTIC	NETWORK																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
ALL	25	26	35	30	30	25	30	24	32	33	27	32	31	23	29	23	24	22	27
GENDER																			
Men	22	23	32	26	25	23	26	21	26	27	24	25	28	21	28	20	21	16	24
Women	30	30	40	34	36	26	35	27	39	39	30	40	33	25	30	27	27	30	32
RACE																			
Black	23	22	34	21	28	19	30	21	27	33	26	26	28	23	41	*	26	24	25
White	26	30	36	34	34	36	30	28	35	32	28	35	36	23	29	24	23	22	29
ETHNICITY																			
Hispanic	*	23	34	*	*	*	28	*	29	*	*	*	*	24	22	*	18	18	23
Non-Hispanic	26	27	36	30	30	25	31	24	32	33	27	32	31	23	32	23	26	26	28
AGE GROUP (years)																			
18-44	*	19	30	39	30	17	31	25	26	26	33	29	31	24	*	*	*	21	25
45-54	*	21	36	27	28	30	30	28	31	35	22	*	27	17	28	*	27	23	26
55-64	24	28	40	24	33	26	28	20	34	35	28	*	32	22	27	*	21	20	27
65-74	23	20	35	27	29	25	32	25	30	28	26	40	29	24	28	22	22	21	27
75+	29	35	33	33	29	26	30	22	36	38	27	42	34	29	36	25	30	26	31
CAUSE OF ESRD																			
Diabetes Mellitus	23	23	39	29	31	25	36	26	35	34	28	35	30	22	29	21	27	19	28
Other Causes Combined	27	28	33	30	30	25	26	22	30	31	26	29	31	24	29	24	21	26	27

* value suppressed because n<11

Figure 26: Percent of incident* adult in-center hemodialysis patients with different types of vascular access upon initiation of a maintenance course of hemodialysis and 90 days later. 2006 ESRD CPM Project.



*An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005.

TABLE 12: Reasons for catheter placement in adult in-center hemodialysis patients using catheters on their last hemodialysis session during October-December 2005. 2006 ESRD CPM Project.

Reason	n	%
Total	2,376	(100)
No fistula or graft surgically planned	451	(19)
Patient size too small for AV fistula/graft	29	(6)
Peripheral vascular disease	95	(21)
Patient preference	293	(65)
Physician/Surgeon preference	92	(20)
Renal transplantation scheduled	15	(3)
Fistula maturing, not ready to cannulate	506	(21)
Graft maturing, not ready to cannulate	77	(3)
No fistula or graf surgically created at this time	440	(19)
Useable fistula or graft sites have been exhausted	418	(18)
Temporary interruption of fistula due to clotting or revisions	125	(5)
Temporary interruption of graft due to clotting or revisions	107	(5)
Other	249	(10)

*Note: Subtotals may not add up to 2,376 as respondents could choose multiple reasons.

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

3. CPM and other Findings for October-December 2005 compared to previous study periods

The percentage of patients incident to dialysis (initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005) with a catheter for vascular access on their last hemodialysis session during the fourth quarter of the calendar year has remained constant at 27% from 2002 to 2005, lower than 2000 when 37% of incident patients used a catheter at their last hemodialysis session during October-December.

Among prevalent patients, the fraction with a catheter at their last hemodialysis session during October-December decreased somewhat in 2005 to 36%, from 40% in 2003 and 2004 (FIGURE 27).

There has been some improvement in the percentage of all patients dialyzing with an AVF on their last hemodialysis session from late 2000 to late 2005 (30% vs. 44%, respectively) (FIGURE 28). 27% of incident patients were dialyzed with an AVF on their last hemodialysis session in late 2000 compared to 54% in late 2005 (FIGURE 28).

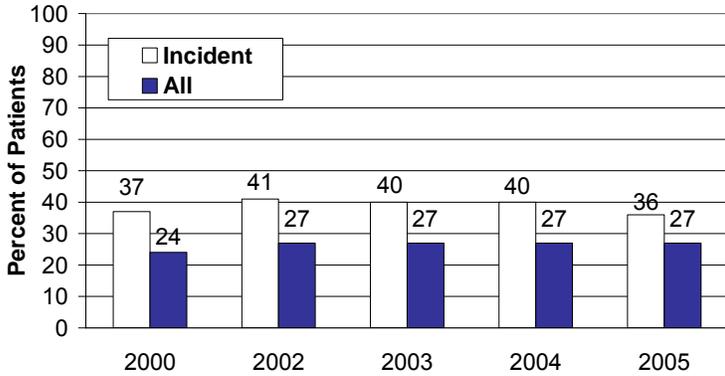
Fourteen percent of all patients were dialyzed with a chronic catheter continuously for 90 days or longer during late 1998 and 1999, compared to 20% of all patients during October-December 2005 (FIGURE 2).

There was little change in the percentage of reported surveillance techniques for patients with either an AVF or an AV graft as their vascular access from late 2001 to late 2005 (FIGURE 29).

TABLE 13: Reasons for catheter placement in adult in-center hemodialysis patients using catheters on their last hemodialysis session during October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.

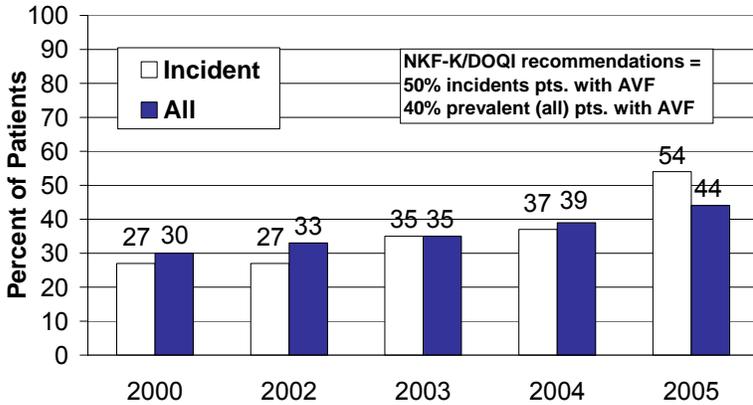
	2002	2003	2004	2005
No fistula or graft surgically planned	22	24	27	19
Fistula or graft maturing, not ready to cannulate	27	23	26	25
Temporary interruption of fistula or graft due to clotting or revisions	14	12	11	10
No fistula or graft surgically created at this time	18	22	21	19
All fistula or graft sites have been exhausted	12	13	11	18

Figure 27: Percent of adult in-center hemodialysis patients (all and incident*) dialyzed with a catheter as their access on their last hemodialysis session during October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



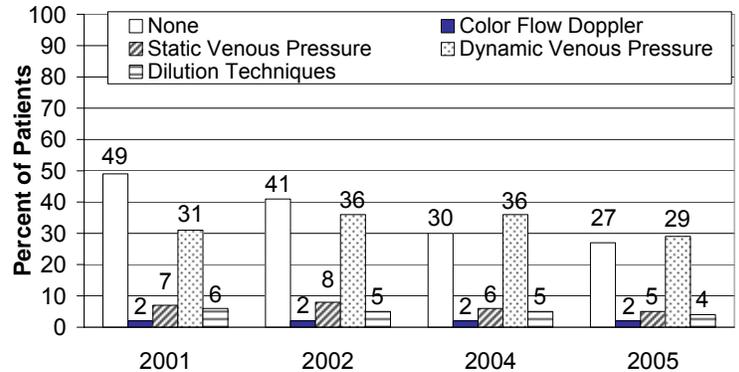
*An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005.

Figure 28: Percent of adult in-center hemodialysis patients (all and incident*) dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



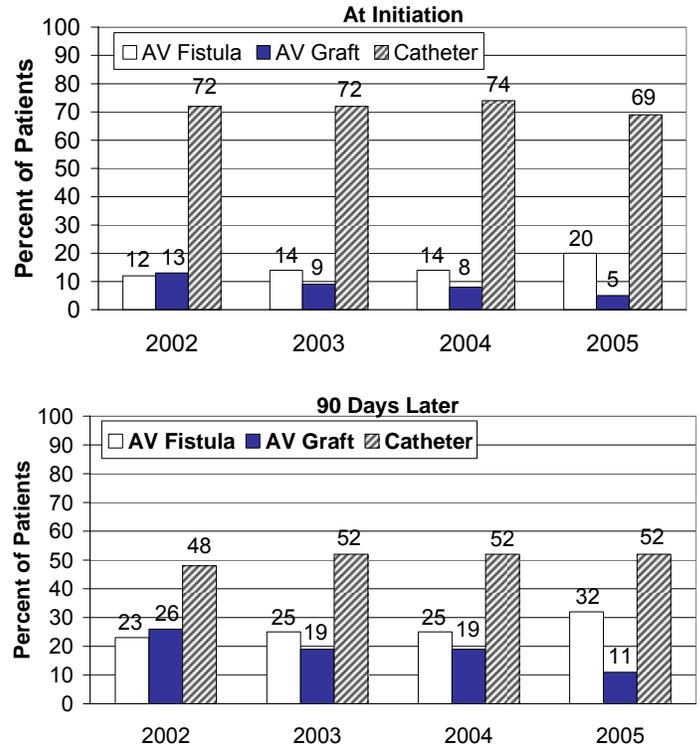
*An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005.

Figure 29: Types of stenosis surveillance reported for adult in-center HD patients with either an AV fistula or an AV graft as their vascular access on their last hemodialysis session during October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



See Appendix 1 for a complete description of the types of stenosis monitoring.

Figure 30: Percent of incident* adult in-center hemodialysis patients with different types of vascular access upon initiation of a maintenance course of hemodialysis and 90 days later, late 2005 compared to previous study periods. 2006 ESRD CPM Project.



*An incident patient is defined as a patient initiating in-center hemodialysis on or between January 1, 2005 and August 31, 2005.

There has been a slight decrease in the reason for a catheter access being "no fistula or graft surgically planned" from late 2002 to late 2005 (22% vs. 19%, respectively) (TABLE 13). There has been a trend for a slightly larger percentage of incident patients to have an AV fistula as their vascular access 90 days after initiation of a maintenance course of hemodialysis over this period (23% vs. 32%, respectively) (FIGURE 30).

C. ANEMIA MANAGEMENT

1. CPM Findings for October–December 2005

Data were collected to assess three anemia management CPMs. The time period from which these data were abstracted was October–December 2005.

Anemia Management CPM I — The target hemoglobin is 11–12 g/dL (110–120 g/L). Patients with a mean hemoglobin > 12 g/dL (120 g/L) and not prescribed epoetin were excluded from analysis for this CPM.

FINDING: For the last quarter of 2005, 35% of the in-center hemodialysis patients who met the inclusion criteria (n=8,141) had a mean hemoglobin 11–12 g/dL (110–120 g/L).

Anemia Management CPM IIa — For all anemic patients (hemoglobin < 11 g/dL [110 g/L]) or patients prescribed epoetin, the percent transferrin saturation and the serum ferritin concentration are assessed (measured) at least once in a three-month period.

FINDING: For the last quarter of 2005, 95% of the in-center hemodialysis patients who met the inclusion criteria (n=8,060) had at least one documented (measured) transferrin saturation value and at least one documented (measured) serum ferritin concentration value during the study period.

Anemia Management CPM IIb — For all anemic patients (hemoglobin < 11 g/dL [110 g/L]) or patients prescribed epoetin, at least one serum ferritin concentration \geq 100 ng/mL and at least one transferrin saturation \geq 20% were documented during the three-month study period.

FINDING: For the last quarter of 2005, 80% of the in-center hemodialysis patients who met the inclusion criteria (n=8,060) had at least one documented transferrin saturation \geq 20% and at least one documented serum ferritin concentration \geq 100 ng/mL during the study period.

Anemia Management CPM III — All anemic patients (hemoglobin < 11 g/dL [110 g/L]), or patients prescribed epoetin, and with at least one transferrin saturation < 20% or at least one serum ferritin

concentration < 100 ng/mL during the study period are prescribed intravenous iron; UNLESS the mean transferrin saturation was \geq 50% or the mean serum ferritin concentration was \geq 800 ng/mL; UNLESS the patient was in the first three months of dialysis and was prescribed a trial dose of oral iron.

FINDING: 81% of the in-center hemodialysis patients who met the inclusion criteria (n=2,963) were prescribed intravenous iron in at least one month during October–December 2005.

2. Other Anemia Management Findings for October–December 2005

NOTE: The following findings apply to all the adult in-center hemodialysis patients in the sample for analysis regardless of when they first initiated dialysis.

The mean \pm SD hemoglobin value for all patients in this sample was 12.0 \pm 1.2 g/dL (120 \pm 12 g/L). The mean hemoglobin values for gender, race, ethnicity, age, diagnosis, duration of dialysis, and selected clinical parameters are shown in Table 14.

The mean hemoglobin value was lower for patients dialyzing less than six months compared to patients dialyzing six months or longer.

The mean hemoglobin value was higher for patients with a mean spKt/V \geq 1.2 compared to patients with a mean spKt/V < 1.2, higher for patients with higher mean serum albumin values, and higher for patients dialyzing with an AVF or AV graft compared to patients dialyzing with a catheter (TABLE 14).

The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was 5% nationally and ranged from 2% to 7% among Networks. The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was higher in patients 18–54 years and patients dialyzing for less than six months compared to older patients and those dialyzing six months or longer, respectively (TABLE 14).

A higher proportion of patients with a mean spKt/V < 1.2 compared to patients with higher mean spKt/V values had a mean hemoglobin value < 10 g/dL (100 g/L). A higher proportion of patients dialyzing with a catheter had a mean hemoglobin < 10 g/dL (100 g/L) compared to patients dialyzing with either an AVF or an AV graft. A higher proportion of patients with a mean serum albumin < 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) compared to patients with higher mean serum albumin values had a mean hemoglobin < 10 g/dL (100 g/L) (TABLE 14).

TABLE 14: Mean hemoglobin values (g/dL) for adult in-center hemodialysis patients in the U.S., by patient characteristics, October–December 2005. 2006 ESRD CPM Project.

Patient Characteristic	Mean hemo- globin (g/dL)	Percent of patients with hemoglobin values					
		<10	10- 10.9	11- 11.9	12- 12.9	13- 13.9	14+
ALL	12.0	5	11	32	35	13	4
GENDER							
Males	12.0	5	11	30	36	13	5
Females	11.9	5	12	34	35	12	2
RACE							
American Indian/Alaska Native	11.9	*	11	35	31	9	*
Asian/Pacific Islander	12.0	*	10	37	38	9	*
Black or African American	12.0	5	12	33	34	12	4
White	12.0	5	11	31	36	13	4
Other/Unknown	12.2	*	*	20	33	23	*
ETHNICITY							
Hispanic	12.1	3	11	30	36	16	4
Non-Hispanic	12.0	5	11	32	35	12	4
AGE GROUP (years)							
18-44	12.0	7	11	27	34	15	6
45-54	12.0	6	12	32	32	13	5
55-64	12.0	5	12	32	37	11	3
65-74	12.0	5	11	34	35	12	3
75+	12.0	4	10	33	38	13	3
CAUSE OF ESRD							
Diabetes Mellitus	12.0	4	12	33	36	12	3
Hypertension	12.0	5	10	33	36	13	4
Glomerulonephritis	12.0	6	11	30	36	11	6
Other/Unknown	12.0	6	12	30	34	14	4
DURATION OF DIALYSIS (years)							
< 0.5	11.5	16	21	25	23	11	4
0.5-0.9	12.2	3	8	28	41	16	5
1.0-1.9	12.1	3	9	31	40	14	3
2.0-2.9	12.0	3	13	34	36	12	2
3.0-3.9	12.0	2	10	36	36	12	3
4.0+	12.0	4	10	34	35	12	5
MEAN spKt/V							
≥ 1.2	12.0	4	11	33	36	13	4
< 1.2	11.7	12	17	26	28	11	5
MEAN SERUM ALBUMIN (g/dL)							
≥ 3.5/3.2 BCG/BCP ^	12.1	3	9	32	38	14	4
< 3.5/3.2 BCG/BCP	11.4	13	20	32	26	8	2
ACCESS TYPE							
AV Fistula	12.1	3	10	31	38	14	4
Graft with AVF	12.1	*	11	29	42	13	*
Graft without AVF	12.0	4	11	36	36	10	4
Catheter	11.8	10	15	29	30	13	3

* Value suppressed because n < 11.

^ BCG/BCP = bromcresol green/bromcresol purple laboratory methods.

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

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Table 15: Percent of all adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by gender, race, ethnicity, age, access type, mean serum albumin, and Network. October - December 2005. 2006 ESRD CPM Project.

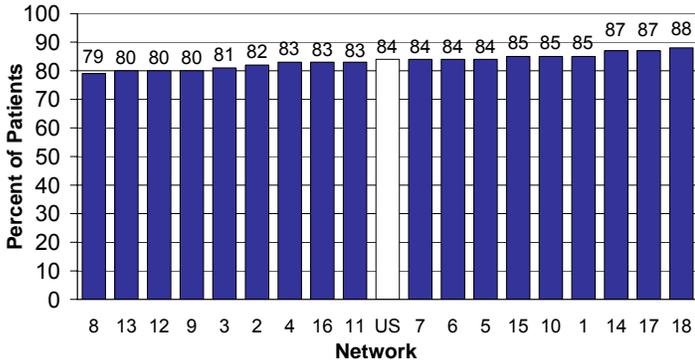
PATIENT CHARACTERISTIC	NETWORK																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
ALL	85	82	81	83	84	84	84	79	80	85	83	80	80	87	85	83	87	88	84
GENDER																			
Men	88	81	79	84	83	83	84	83	80	85	85	84	81	89	83	84	88	88	84
Women	81	83	84	81	86	86	84	76	81	84	81	76	79	84	87	82	86	89	83
RACE																			
Black	79	83	80	88	85	86	84	77	84	83	76	78	81	82	77	79	89	95	83
White	87	81	82	80	84	83	84	83	79	86	86	80	79	89	85	85	84	88	84
ETHNICITY																			
Hispanic	80	79	82	*	*	82	91	*	*	92	88	*	*	88	88	81	88	86	86
Non-Hispanic	86	82	80	83	84	85	83	79	80	84	83	80	80	86	83	83	86	91	83
AGE GROUP (years)																			
18-44	82	78	83	70	81	80	82	86	80	81	85	84	81	76	85	83	83	85	81
45-54	81	87	79	83	82	80	87	76	77	85	77	70	84	84	83	82	85	89	82
55-64	85	80	76	90	81	85	81	78	84	77	85	86	74	90	86	79	93	90	84
65-74	86	78	83	83	89	89	83	76	82	88	78	77	86	89	82	83	86	86	84
75+	88	86	84	83	88	88	86	85	77	91	89	81	76	92	86	87	86	91	86
ACCESS TYPE																			
AV Fistula	90	85	88	87	84	87	89	83	87	89	87	86	83	91	88	86	91	90	88
Graft with AVF	*	90	*	*	*	80	92	*	83	*	92	*	*	*	*	*	*	*	88
Graft without AVF	88	83	84	89	88	87	83	81	78	87	84	82	85	88	91	85	92	91	86
Catheter	72	73	70	70	81	78	77	70	74	78	76	69	70	76	74	73	75	81	75
MEAN SERUM ALBUMIN																			
$\geq 3.5/3.2$ BCG/BCP [^]	89	84	86	86	90	88	89	85	86	88	88	86	85	91	87	87	89	90	88
< 3.5/3.2 BCG/BCP	71	71	66	72	64	66	60	55	57	69	66	61	60	69	73	66	78	79	67

* value suppressed because n<11

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.
[^] bromocresol green/bromocresol purple laboratory methods

Figure 31: Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by Network, October–December 2005. 2006 ESRD CPM Project.

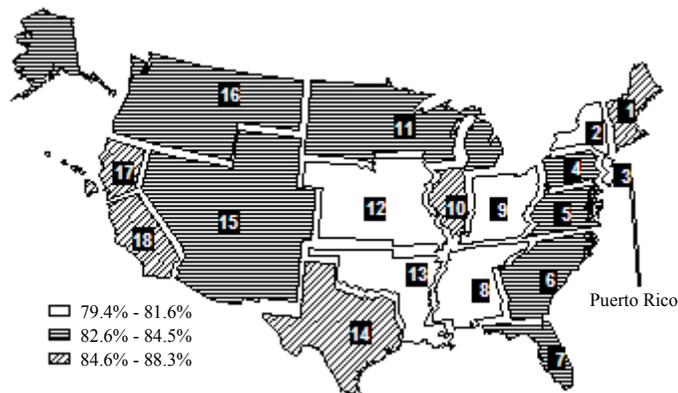


Note: To convert hemoglobin to conventional units of g/dL to SI units (g/L), multiply by 10.

The percentage of all patients with mean hemoglobin ≥ 11 g/dL (110 g/L) was 84% nationally and ranged from 79% to 88% by Network (TABLE 15, FIGURES 31, 32).

The percentage of patients with mean hemoglobin ≥ 11 g/dL (110 g/L) by selected patient characteristics and clinical parameters is shown in Figure 33. More patients dialyzing for six months or longer had a mean hemoglobin ≥ 11 g/dL (110 g/L) compared to patients dialyzing less than six months (87% vs. 63%, respectively). A higher percentage of patients dialyzing with an AVF, Graft with AVF, or Graft without AVF met this threshold compared to patients dialyzing with a catheter (88%, 88% and 86% compared to 75%, respectively). Patients with higher mean spKt/V and serum albumin values were more likely to meet this hemoglobin target than patients with lower spKt/V and serum albumin values.

Figure 32: Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by Network, October–December 2005. 2006 ESRD CPM Project.



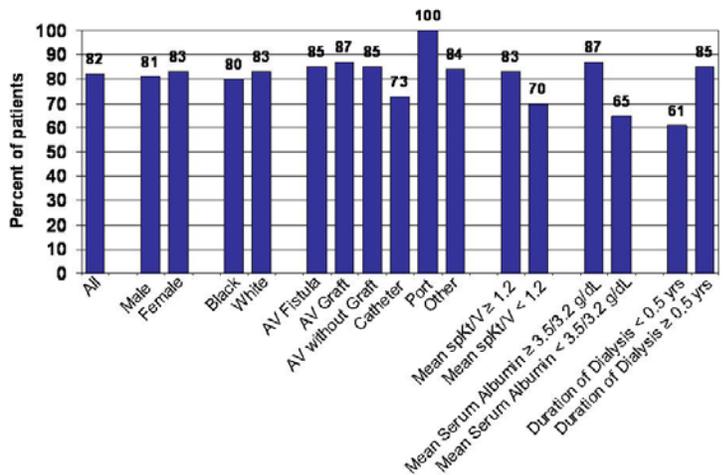
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

During this study period, data were collected on additional measures related to anemia management (TABLE 16).

The national average \pm SD transferrin saturation for the patients in the sample was $28 \pm 12\%$ and ranged from 25% to 30% among the 18 Network areas (TABLE 16). Table 16 also provides the percentage of patients with mean transferrin saturation $\geq 20\%$ nationally (78%) and by Network area, ranging from 68% to 83%.

The national average \pm SD serum ferritin concentration for the patients in the sample was 593 ± 405 ng/mL and ranged from 491 to 659 ng/mL among the 18 Network areas. The percentage of patients with a mean serum ferritin concentration ≥ 100 ng/mL nationally was 95%, ranging from 92% to 97% among the 18 Network areas (TABLE 16).

Figure 33: Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by selected patient characteristics and clinical parameters, October–December 2005. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

75% of all patients in the sample were prescribed either intravenous (IV) or oral iron at least once during the three-month study period. The percentage of patients with IV iron prescribed nationally was 69%, ranging from 63% to 76% among the 18 Network areas (TABLE 16).

For the subset of patients with both mean transferrin saturation $< 20\%$ and mean serum ferritin concentration < 100 ng/mL ($n=193$ or 2% of patients), only 73% were prescribed IV iron at least once during the three-month study period.

Table 16: Regional variation for various anemia management measures for adult in-center hemodialysis patients including the percent of patients with mean hemoglobin ≥ 11 g/dL, mean hemoglobin (g/dL), and mean serum albumin ≥ 4.0 (BCG)[^] for these patients nationally and by Network. October - December 2005. 2006 ESRD CPM Project.

ANEMIA MANAGEMENT MEASURE:	NETWORK																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
Percent of patients with mean hemoglobin ≥ 11 g/dL	85	82	81	83	84	84	84	84	79	80	85	83	80	87	85	83	87	88	84
Mean hemoglobin (g/dL)	11.9	11.9	12.0	12.0	12.0	12.0	12.0	11.9	11.9	11.9	12.0	12.1	11.8	12.1	12.1	12.0	12.0	12.0	12.0
Percent of patients with mean serum albumin ≥ 4.0 g/dL (BCG) [^]	32	33	34	29	36	32	36	34	28	32	32	30	25	31	35	31	37	39	33
Average transferrin saturation (TSAT) (%)	27	29	28	27	29	29	29	27	26	27	28	26	27	29	27	25	27	30	28
Percent of patients with mean TSAT $\geq 20\%$	76	79	78	78	81	83	81	76	75	77	77	73	77	82	77	68	71	83	78
Average serum ferritin concentration (ng/mL)	567	593	584	541	596	608	624	578	601	601	601	563	558	622	659	538	491	555	639
Percent of patients with mean serum ferritin concentration ≥ 100 ng/mL	96	92	95	93	94	97	93	96	94	94	94	95	95	95	95	93	94	95	95
Percent of patients with mean serum ferritin concentration ≥ 800 ng/mL	22	25	24	19	24	24	28	21	25	22	22	20	22	28	31	18	13	19	28
Percent of all patients with IV iron prescribed	72	63	71	76	69	69	66	75	69	72	69	66	66	68	69	70	69	67	69
Percent of patients prescribed ESA ^{^^}	96	96	96	97	97	96	96	96	94	96	96	91	97	97	96	94	96	95	95
Percent of patients with mean hemoglobin <11 g/dL with ESA prescribed	99	97	96	100	99	97	95	96	93	94	94	91	100	97	94	92	96	89	96

* value suppressed because n<11

[^]For subset of patients with serum albumin tested by the bromocresol green (BCG) laboratory method

^{^^}ESA - Erythropoietin Stimulating Agents

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

3. CPM and other Findings for October-December 2005 compared to previous study periods

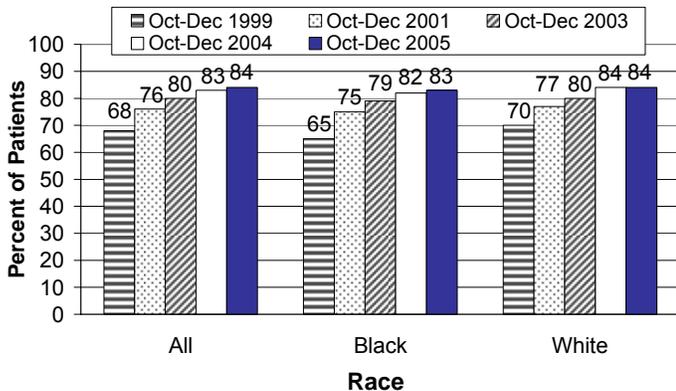
NOTE: The following findings apply to all the adult in-center hemodialysis patients in the sample for analysis regardless of when they first initiated dialysis.

The mean ± SD hemoglobin from October–December 2001 to October–December 2005 increased from 11.7 ± 1.2 g/dL (117 ± 12) g/L to 11.9 ± 1.2 g/dL (119 ± 12 g/L) (FIGURE 7), and the percentage of patients with a mean hemoglobin ≥ 11 g/dL (110 g/L) increased significantly from 76% to 84% (FIGURES 6, 34).

In addition to the improvement in the percentage of patients with mean hemoglobin ≥ 11 g/dL (110 g/L), there was also a decrease in the percentage of patients with mean hemoglobin < 10 g/dL (100 g/L). In October–December 2005, 5% of Black patients and 5% of White patients had a mean hemoglobin < 10 g/dL (100 g/L).

Figure 35 depicts the status of iron stores for the sampled patients in late 2005 compared to selected previous study periods. 69% of patients were prescribed IV iron in late 2005 compared to 59% in late 1998. Within the subgroup of patients with mean transferrin saturation < 20% and mean serum ferritin concentration < 100 ng/mL, 73% of patients were prescribed IV iron at least once over the three-month study period in late 2005, compared to 37% in late 1996.

Figure 34: Percent of adult in-center hemodialysis patients with mean hemoglobin values ≥ 11 g/dL, by race, October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.



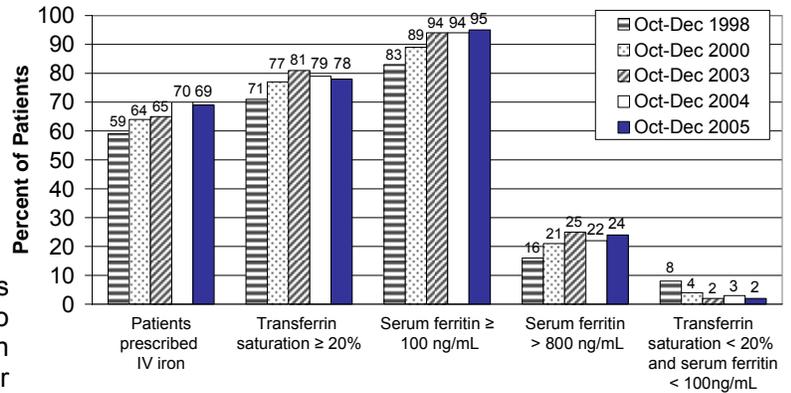
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

D. SERUM ALBUMIN

1. CPM Findings for October–December 2005

Because serum albumin is not considered to be an official CPM for this project, there are no CPM findings to report for this section.

Figure 35: Percent of adult in-center hemodialysis patients with specific anemia management indicators, October–December 2005 compared to selected previous study periods. 2006 ESRD CPM Project.



2. Other Serum Albumin Findings for October–December 2005

The two commonly used laboratory methods for determining serum albumin values, bromcresol green (BCG) and bromcresol purple (BCP), have been reported to yield systematically different results (6). Therefore, we assessed the serum albumin values reported for these two methods separately. The mean ± SD serum albumin value for patients whose value was determined by the BCG method (n=8,163) was 3.8 ± 0.4 g/dL (38 ± 4 g/L), and by the BCP method (n=445) was 3.4 ± 0.5 g/dL (34 ± 5 g/dL) (FIGURE 36).

Lower serum albumin values have been shown to be associated with diminished survival (29-31). Figure 36 displays the distribution of serum albumin values by laboratory method.

The percentages of patients with mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) and ≥ 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) by gender, race, ethnicity, age, diagnosis, duration of dialysis, and selected clinical parameters are shown in Table 17. Higher percentages of men, Blacks, patients 18-44 years old, patients with causes of ESRD other than diabetes mellitus, and patients dialyzing six months or longer had a mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) compared to women, Whites, patients older than 44 years, patients with diabetes mellitus as the cause of ESRD, and patients dialyzing less than six months (TABLES 17, 18, FIGURES 37, 38). Only 15% of patients dialyzing less than six months achieved a serum albumin that met the outcome goal of ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) compared to 35% of patients dialyzing six months or more.

TABLE 17: Percent of adult in-center hemodialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP)* and $\geq 3.5/3.2$ g/dL (BCG/BCP) in the U.S., by patient characteristics, October-December 2005. 2006 ESRD CPM Project.

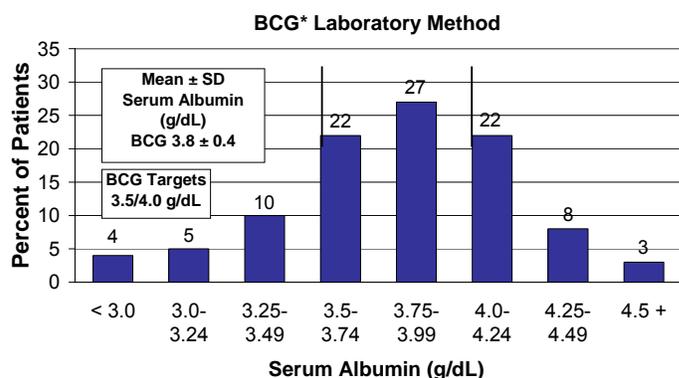
Patient Characteristic	Percent of Patients with Mean	
	$\geq 4.0/3.7$ g/dL	$\geq 3.5/3.2$ g/dL
TOTAL	33	80
GENDER		
Men	37	82
Women	27	78
RACE		
American Indian/ Alaska Native	19	72
Asian/Pacific Islander	39	85
Black or African American	36	83
White	30	78
Other/Unknown	30	81
ETHNICITY		
Hispanic	37	81
Non-Hispanic	32	80
AGE GROUP (years)		
18-44	51	88
45-54	37	83
55-64	33	81
65-74	29	79
75+	20	75
CAUSE OF ESRD		
Diabetes Mellitus	26	77
Hypertension	37	84
Glomerulonephritis	47	86
Other/Unknown	35	79
DURATION OF DIALYSIS (years)		
< 0.5	15	60
0.5-0.9	26	75
1.0-1.9	36	84
2.0-2.9	32	84
3.0-3.9	36	85
4.0+	39	85
MEAN spKt/V		
≥ 1.2	33	82
< 1.2	26	71
MEAN Hgb (g/dL)		
≥ 11	35	84
< 11	18	61
ACCESS TYPE		
AV Fistula	39	86
Graft with AVF	37	84
Graft without AVF	34	85
Catheter	21	67

*Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods.

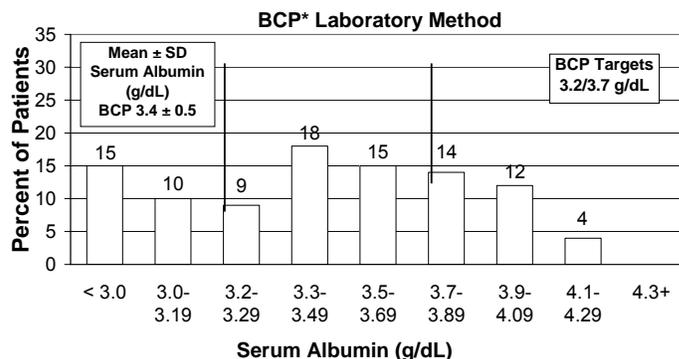
Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 36: Distribution of mean serum albumin for adult in-center hemodialysis patients, by laboratory method, October-December 2005. 2006 ESRD CPM Project.



*Note: BCG=bromcresol green laboratory method.
Note: To convert serum albumin conventional unites of g/dL to SI units (g/L), multiply by 10.



*Note: BCP=bromcresol purple laboratory method.
Note: To convert serum albumin conventional unites of g/dL to SI units (g/L), multiply by 10.

A higher percentage of patients with higher mean hemoglobin and mean spKt/V values had a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) compared to patients with lower mean hemoglobin and mean spKt/V values. More patients dialyzing with either an AVF, graft with AVF, or graft without AVF compared to patients dialyzing with a catheter had a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) (39%, 37%, and 34% vs. 21% respectively) (TABLES 17, 18).

TABLE 18: Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP method)** by gender, race, ethnicity, age, cause of ESRD, access type, mean spKt/V, mean hemoglobin, and Network, October - December 2005. 2006 ESRD CPM Project.

PATIENT CHARACTERISTIC	NETWORK																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.	
ALL	32	31	33	28	36	33	36	35	28	32	31	25	31	31	35	31	37	39	33	
GENDER																				
Men	36	37	36	32	40	40	40	39	33	35	34	29	37	37	38	35	41	42	37	
Women	26	23	29	23	31	24	30	30	23	30	27	21	26	25	29	26	32	35	27	
RACE																				
Black	34	38	36	30	38	35	34	39	33	34	43	29	36	34	39	*	36	46	36	
White	30	26	30	27	32	27	38	29	26	31	25	23	26	30	36	32	37	37	30	
ETHNICITY																				
Hispanic	*	35	39	*	*	*	44	*	*	41	*	*	*	31	38	*	41	39	37	
Non-Hispanic	32	30	30	27	35	33	34	35	28	31	30	24	31	31	33	30	36	38	32	
AGE GROUP (years)																				
18-44	54	54	53	32	61	52	46	51	48	50	52	39	49	53	56	63	49	56	51	
45-54	44	46	44	41	38	25	48	39	34	29	40	36	31	34	36	*	38	40	37	
55-64	36	34	31	31	32	34	31	36	26	37	28	32	32	27	31	25	45	45	33	
65-74	28	19	35	24	36	24	34	30	26	31	27	*	27	33	38	*	38	36	29	
75+	18	18	17	20	20	28	26	21	18	19	20	17	22	12	23	28	21	23	20	
CAUSE OF ESRD																				
Diabetes Mellitus	28	26	26	25	29	21	25	26	20	23	27	23	23	27	29	23	33	29	26	
Other Causes Combined	34	34	39	30	40	40	43	42	35	40	34	28	38	36	41	36	40	48	38	
ACCESS TYPE																				
AV Fistula	41	40	42	33	42	42	43	42	35	38	33	34	38	39	41	34	39	44	39	
Graft with AVF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	40	37
Graft without AVF	33	24	31	32	39	32	36	35	26	31	38	30	38	32	37	*	43	42	34	
Catheter	*	22	25	16	25	20	24	25	19	24	17	*	17	18	22	24	24	24	21	
MEAN spKt/V																				
≥ 1.2	32	31	34	29	36	33	36	37	29	32	32	27	32	32	35	30	38	39	33	
< 1.2	*	*	*	*	40	27	31	*	*	37	23	*	*	*	*	*	31	37	26	
MEAN Hb (g/dL)																				
≥ 11	34	32	36	31	39	35	39	39	32	35	34	29	34	34	37	34	40	40	35	
< 11	*	24	24	*	18	18	18	21	11	*	16	*	20	15	20	*	*	29	18	

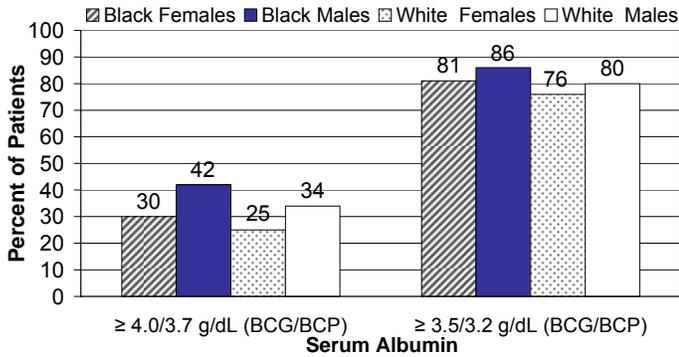
* value suppressed because n<11

**Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

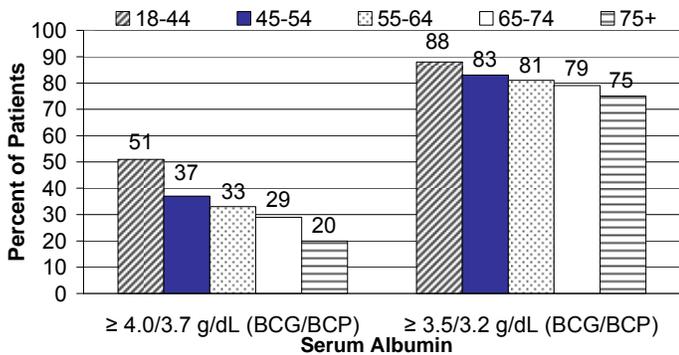
Figure 37: Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* and $\geq 3.5/3.2$ g/dL (BCG/BCP), by race and gender, October–December 2005. 2006 ESRD CPM Project.



*Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 38: Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* and $\geq 3.5/3.2$ g/dL (BCG/BCP), by age, October–December 2005. 2006 ESRD CPM Project.

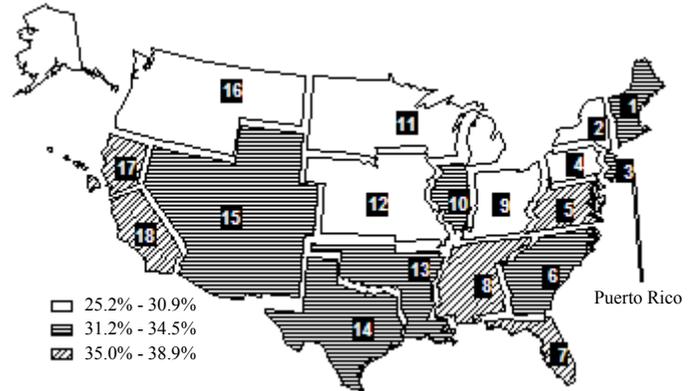


*Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Nationally, 33% of patients had mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) ranging from 25% to 39% among the 18 Networks (FIGURE 39, TABLE 18); 80% of patients had mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) ranging from 75%-84% among the 18 Networks (APPENDIX 6). The percentage of patients in each Network area with mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP), by gender, race, ethnicity, age group, cause of ESRD, and selected clinical parameters is shown in Table 18.

Figure 39: Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* by Network, October–December 2005. 2006 ESRD CPM Project.



*Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods.

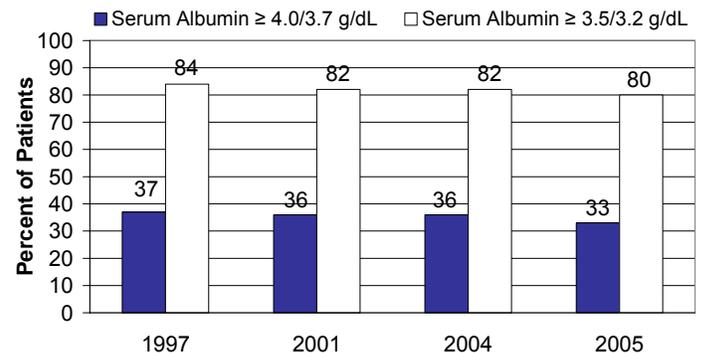
Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

3. Findings for October–December 2005 compared to previous study periods

No clinically important changes or improvements were noted in the proportion of adult in-center hemodialysis patients with a serum albumin that met the outcome goal of $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) during October–December 2005 compared to previous study periods.

Figure 40 shows the percentage of patients with mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) and the percentage of patients with mean serum albumin values $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) during October–December 2005 compared to selected previous study periods.

Figure 40: Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* and $\geq 3.5/3.2$ g/dL (BCG/BCP), October–December 2005 compared to selected previous study periods. 2006 ESRD CPM Project.



*Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

VI. ADULT PERITONEAL DIALYSIS PATIENTS

This section describes the findings for adult peritoneal dialysis patients for selected CPMs and other quality indicators related to adequacy of peritoneal dialysis, anemia management, and serum albumin. Each of these sections is further broken down into three parts:

- (1) National findings for selected CPM results for October 2005–March 2006 (the serum albumin information is not considered a CPM for this Report);
- (2) A description of other quality indicators and data analyses; and
- (3) A comparison of CPMs and other indicators and findings between October 2005–March 2006 and previous study periods.

A national random sample of adult (≥ 18 years) peritoneal dialysis patients who were alive and dialyzing on December 31, 2005, was selected (sample size=1,469). 1,409 patients (96%) were included in the sample for analysis (TABLE 3).

A. ADEQUACY OF PERITONEAL DIALYSIS

1. CPM Findings for October 2005–March 2006

Data to assess three peritoneal dialysis adequacy CPMs were collected in 2006. The time period from which these data were abstracted was October 2005–March 2006. Tidal peritoneal dialysis patients ($n=63$) were excluded from the CPM calculations.

Peritoneal Dialysis Adequacy CPM I — The patient's total solute clearance for urea and creatinine is measured routinely (defined for this Report as at least once during the six-month study period).

FINDING: 80% of adult peritoneal dialysis patients had both a weekly Kt/V_{urea} and a weekly creatinine clearance measurement reported at least once during the six-month study period (FIGURE 3).

Peritoneal Dialysis Adequacy CPM II — The patient's total solute clearance for urea (weekly Kt/V_{urea}) and creatinine (weekly creatinine clearance) is calculated in a standard way. (See Peritoneal Dialysis Adequacy CPM II in Appendix 1).

FINDING: 41% of adult peritoneal dialysis patients who had reported adequacy measurements documented in their charts at least once during the six-month study period had these reported measurements (Kt/V_{urea} and creatinine clearance) calculated in a standard way as described in Peritoneal Dialysis Adequacy CPM II in Appendix 1 (FIGURE 3).

Peritoneal Dialysis Adequacy CPM III — For patients on CAPD, the delivered peritoneal dialysis dose is a weekly Kt/V_{urea} of at least 2.0 and a weekly creatinine clearance of at least 60 L/week/1.73 m² OR there is evidence that the dialysis prescription was changed if

the adequacy measurements were below these thresholds during the six-month study period.

For CCPD patients (cycler patients with a daytime dwell), the delivered peritoneal dialysis dose is a weekly Kt/V_{urea} of at least 2.1 and a weekly creatinine clearance of at least 63 L/week/1.73m² OR there was evidence the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period.

For NIPD patients (cycler patients without a daytime dwell), the delivered peritoneal dialysis dose is a weekly Kt/V_{urea} of at least 2.2 and a weekly creatinine clearance of at least 66/L/week/1.73m² OR there was evidence the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period.

For the October 2005-March 2006 study period, CCPD patients and NIPD patients were not distinguishable. For Cycler patients, the delivered peritoneal dialysis dose is a weekly Kt/V_{urea} of at least 2.1 and a weekly creatinine clearance of at least 63 L/week/1.73m².

FINDING: 72% of CAPD patients had a mean weekly $Kt/V_{urea} \geq 2.0$ and a mean weekly creatinine clearance ≥ 60 L/week/1.73 m² OR there was evidence that the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period (FIGURE 4).

ALTERNATE FINDING: 80% (129/160) of CAPD patients with a Peritoneal Equilibration Test (PET) result within 12 months of or during the study period met the revised 2000 NKF-KDOQI thresholds for peritoneal dialysis adequacy (3): a mean weekly $Kt/V_{urea} \geq 2.0$ and a weekly creatinine clearance ≥ 60 L/week/1.73m² for high and high-average transporters or ≥ 50 L/week/1.73m² for low and low-average transporters — OR evidence that the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period.

FINDING: 59% of cycler patients had a mean weekly $Kt/V_{urea} \geq 2.1$ and a mean weekly creatinine clearance ≥ 63 L/week/1.73 m² OR there was evidence that the dialysis prescription was changed if the adequacy measurements were below these thresholds during the six-month study period (FIGURE 4).

2. Other Peritoneal Dialysis Adequacy Findings for October 2005-March 2006

There were 452 patients categorized as CAPD patients and 732 patients categorized as cycler patients during the study period. Tidal peritoneal dialysis patients ($n=63$) were excluded from the peritoneal dialysis adequacy analyses

reported below. By using values abstracted from medical records of peritoneal dialysis patients, it was possible to calculate at least one of the adequacy measures (weekly Kt/V_{urea} or weekly creatinine clearance) for 1,075 (80%) of the 1,346 patients included for these analyses during the 2006 study period.

Table 20 shows 62% of high/high-average transporter and 71% of low/low-average transporter CAPD patients had a mean weekly $Kt/V_{urea} \geq 2.0$. 70% of high/high-average transporter and 72% of low/low-average transporter CAPD patients had a mean weekly creatinine clearance meeting NKF-KDOQI guidelines.

57% of cyclor patients had a mean calculated weekly Kt/V_{urea} and 48% had a mean calculated weekly creatinine clearance that met recommended NKF-KDOQI guidelines during the 2006 study period. (TABLE 21).

The distribution of PET results is depicted in Table 19. Most patients had a result in the High-Average range.

TABLE 19: Distribution of Peritoneal Equilibration Test (PET) results for adult peritoneal dialysis patients by modality, October 2005-March 2006. 2006 ESRD CPM Project.

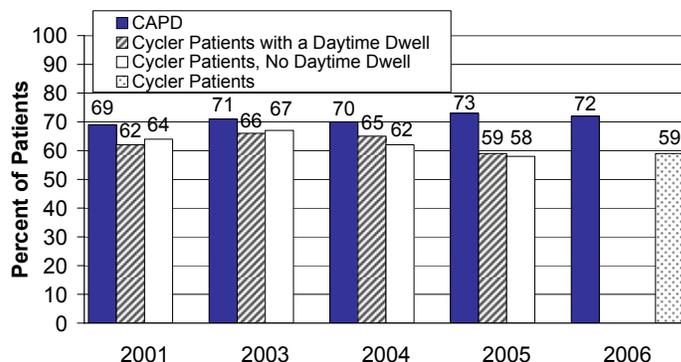
	CAPD		Cycler Patients	
	n	(%)	n	(%)
Low (0.34-0.49)	15	(8)	25	(9)
Low-Average (0.50-0.64)	55	(30)	80	(30)
High-Average (0.65-0.81)	87	(48)	133	(50)
High (0.82-1.03)	25	(14)	30	(11)

3. CPM and other Findings for October 2005–March 2006 compared to previous study periods

The adequacy of peritoneal dialysis was reported for 80% of adult peritoneal dialysis patients at least once during the 2006 six-month study period, October 2005–March 2006 (PD Adequacy CPM I), compared to 82% during the 2005 study period. (FIGURE 3).

There was little change in the percentage of CAPD patients meeting NKF-KDOQI thresholds for peritoneal dialysis adequacy (3) from the 2001 study period to the 2006 study period (FIGURES 4, 41).

Figure 41: Percent of adult peritoneal dialysis patients meeting 1997 NKF-DOQI guidelines for weekly Kt/V_{urea} and weekly creatinine clearance (PD Adequacy CPM III). 2006 ESRD CPM Project.



Note: For Oct 2005-Mar 2006 collection, CCPD and NIPD were not distinguishable.

Table 20 depicts the percentage of CAPD patients by transporter type with a mean calculated weekly Kt/V_{urea} and a mean calculated weekly creatinine clearance meeting recommended NKF-KDOQI guidelines for those patients with sufficient data to calculate adequacy measures over the past five study periods.

There has been little change over the past five study periods in the percentages of cycler patients meeting the NKF-KDOQI thresholds for weekly Kt/V_{urea} or weekly creatinine clearance values (TABLE 21).

B. ANEMIA MANAGEMENT

1. CPM Findings for October 2005–March 2006

Data to assess three anemia management CPMs were collected in 2006. The time period from which these data were abstracted was October 2005–March 2006.

Anemia Management CPM I — The target hemoglobin is 11–12 g/dL (110-120 g/L). Patients with a mean hemoglobin > 12 g/dL (120 g/L) and not prescribed epoetin were excluded from analysis for this CPM.

FINDING: For the six-month study period, 30% of the peritoneal dialysis patients who met the inclusion criteria had a mean hemoglobin 11–12 g/dL (110-120 g/L) during October 2005- March 2006.

TABLE 20: Percent of adult CAPD patients with mean \pm SD weekly adequacy values meeting 2000 NKF-KDOQI guidelines and median adequacy values, by transporter type (4 hr. D/P Cr Ratio), October 2005-March 2006. 2006 ESRD CPM Project.

Adequacy Measure	Oct 2001-Mar 2002		Oct 2002-Mar 2003		Oct 2003-Mar 2004		Oct 2004-Mar 2005		Oct 2005-Mar 2006	
	High-Avg/ High*	Low/ Low-Avg	High-Avg/ High	Low/ Low-Avg	High-Avg/ High	Low/ Low-Avg	High-Avg/ High	Low/ Low-Avg	High-Avg/ High	Low/ Low-Avg
Weekly Kt/V_{urea}										
% meeting NKF - KDOQI [^]	73%	69%	74%	81%	59%	75%	68%	62%	62%	71%
Mean \pm SD	2.41 \pm 0.71	2.40 \pm 0.69	2.36 \pm 0.59	2.37 \pm 0.48	2.24 \pm 0.67	2.34 \pm 0.64	2.41 \pm 0.70	2.28 \pm 0.77	2.29 \pm 0.55	2.26 \pm 0.60
Median	2.27	2.23	2.26	2.4	2.09	2.29	2.36	2.1	2.27	2.25
Weekly Creatinine Clearance (L/week/1.73 m²)										
% meeting NKF - KDOQI	73%	80%	66%	79%	70%	64%	73%	61%	70%	72%
Mean \pm SD	79.9 \pm 28.4	77.5 \pm 32.3	80.1 \pm 30.0	72.9 \pm 26.6	78.1 \pm 27.8	75.9 \pm 28.4	81.0 \pm 27.6	75.4 \pm 32.2	81.12 \pm 30.89	77.14 \pm 26.91
Median	72.5	67.6	72.8	69.6	74.3	71.3	76.4	67.8	69.1	78.4

[^]For CAPD patients, the delivered PD dose should be a weekly Kt/V_{urea} \geq 2.0 and a weekly creatinine clearance \geq 60 L/week/1.73m² for high-average and high transporters, and \geq 50 L/week/1.73m² for low and low-average transporters.

*Transporter type (4 hr. D/P Cr Ratio): Low = 0.34-0.49; Low-Average = 0.50-0.64; High-Average = 0.65-0.81; High = 0.82-1.03.

TABLE 21: Percent of adult cycler patients with mean \pm SD Weekly adequacy values meeting 2000 NKF-K/DOQI guidelines and median adequacy values, October 2005-March 2006. 2006 CPM Project.

Adequacy Measure	Oct 2001 - Mar 2002		Oct 2002 - Mar 2003		Oct 2003 - Mar 2004		Oct 2004 - Mar 2005		Oct 2005 - Mar 2006	
	w/daytime dwell	no daytime dwell	w/daytime dwell	Cycler [^]						
Adequacy Measure										
Weekly Kt/V_{urea}										
% meeting NKF - KDOQI [^]	66%	61%	64%	58%	59%	56%	57%	60%	57%	
Mean \pm SD	2.33 \pm 0.55	2.39 \pm 0.70	2.31 \pm 0.54	2.53 \pm 0.8	2.29 \pm 0.6	2.39 \pm 0.73	2.23 \pm 0.61	2.37 \pm 0.77	2.26 \pm 0.62	
Median	2.25	2.29	2.25	2.38	2.23	2.3	2.19	2.34	2.17	
Weekly Creatinine Clearance (L/week/1.73 m²)										
% meeting NKF - KDOQI	55%	53%	49%	56%	48%	44%	49%	50%	48%	
Mean \pm SD	71.0 \pm 26.3	76.2 \pm 31.8	66.5 \pm 22.2	74.3 \pm 33.0	67.5 \pm 24.2	71.9 \pm 30.7	66.8 \pm 23.2	72.4 \pm 29.9	66.72 \pm 24.48	
Median	65.7	68.1	62.3	70.2	62.5	62.3	62.4	66.4	61.9	

[^]For Cycler patients with daytime dwell (CCPD patients), Kt/V_{urea} \geq 2.1; creatinine clearance \geq 63 L/week/1.73m².

For nighttime Cycler patients (no daytime dwell) (NIPD patients), Kt/V_{urea} \geq 2.2; creatinine clearance \geq 66 L/week/1.73m².

For Oct 2005-Mar 2006 collection, CCPD and NIPD were not distinguishable. For Cycler patients, Kt/V_{urea} \geq 2.1; creatinine clearance \geq 63 L week/1.73m².

Anemia Management CPM IIa — For all anemic patients (hemoglobin < 11g/dL [110 g/L]) or patients prescribed epoetin, the percent transferrin saturation and serum ferritin concentration are assessed (measured) at least two times during the six-month study period.

FINDING: 76% of the peritoneal dialysis patients who met the inclusion criteria had at least two documented (measured) transferrin saturation values and at least two documented (measured) serum ferritin concentration values during October 2005-March 2006.

Anemia Management CPM IIb — For all anemic patients (hemoglobin < 11 g/dL [110 g/L]) or patients prescribed epoetin, at least one serum ferritin concentration ≥ 100 ng/mL and at least one transferrin saturation ≥ 20% were documented during the six-month study period.

FINDING: 83% of the adult peritoneal dialysis patients who met the inclusion criteria had at least one documented transferrin saturation ≥ 20% and at least one documented serum ferritin concentration ≥ 100 ng/mL during October 2005–March 2006.

Anemia Management CPM III — All anemic patients (hemoglobin < 11 g/dL [110 g/L]) or patients prescribed epoetin, with at least one transferrin saturation < 20% or at least one serum ferritin concentration < 100 ng/mL during the study period are prescribed intravenous iron; UNLESS the mean transferrin saturation was ≥ 50% or the mean serum ferritin concentration was ≥ 800 ng/ml; or UNLESS the patient was in the first three months of dialysis and was prescribed a trial dose of oral iron.

FINDING: 39% of the peritoneal dialysis patients who met the inclusion criteria were prescribed intravenous iron at least once during October 2005–March 2006.

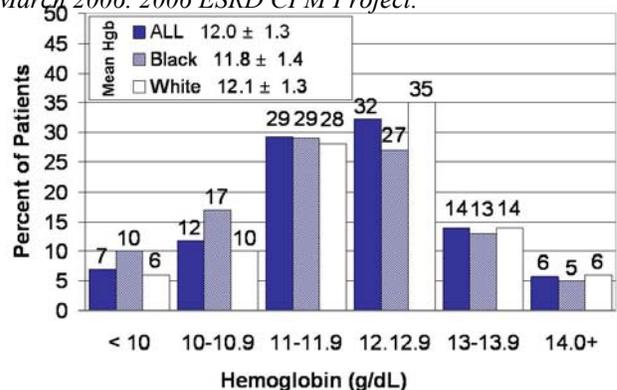
2. Other Anemia Management Findings for October 2005-March 2006

The mean ± SD hemoglobin for adult peritoneal dialysis patients in the sample was 12.0 ± 1.3 g/dL (120 ± 13 g/L) (FIGURES 9, 42). The distributions of mean hemoglobin values for all patients and by race are depicted in Figure 42. The mean hemoglobin values and the proportion of patients within different hemoglobin categories for gender, race, ethnicity, age, diagnosis, duration of dialysis, mean serum albumin concentration and weekly creatinine clearance are shown in Table 22. Nationally, 81% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L) (FIGURES 8, 42; TABLE 22). Significantly more Whites and patients older than 45 years had a mean hemoglobin ≥ 11 g/dL (110 g/L) compared to Blacks and younger patients (TABLE 22). A larger percentage of patients with higher mean serum albumin and weekly creatinine clearance had a mean hemoglobin ≥ 11 g/dL (110 g/L) compared to

patients with lower mean serum albumin and weekly creatinine clearance values.

The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was 7% (FIGURE 42, TABLE 22). The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was significantly higher in patients with lower mean serum albumin values compared to patients with higher mean serum albumin values (TABLE 22).

Figure 42: Distribution of mean hemoglobin values for adult peritoneal dialysis patients in the U.S., by race, October 2005-March 2006. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

The mean ± SD transferrin saturation for the patients in this sample was 30 ± 11% and 85% of patients had mean transferrin saturation ≥ 20%. The mean ± SD serum ferritin concentration was 450 ± 411 ng/mL, with 88% of patients having a mean serum ferritin concentration ≥ 100 ng/mL. 16% of patients had a mean serum ferritin > 800 ng/mL. Four percent of patients had both a mean transferrin saturation < 20% and a mean serum ferritin concentration < 100 ng/mL.

91% of the patients in the sample for analysis were prescribed ESAs during the six-month study period. ESAs were prescribed 96% of the time when the mean hemoglobin values were < 10 g/dL (100 g/L), 98% of the time when the mean hemoglobin values were 10-10.9 g/dL (100-109 g/L), 98% of the time when mean hemoglobin values were 11-11.9 g/dL (110-119 g/L), 93% of the time when mean hemoglobin values were 12-12.9 g/dL (120-129 g/L), 81% of the time when mean hemoglobin values were 13-13.9 g/dL (130-139 g/L), and 51% of the time when mean hemoglobin values were 14 g/dL (140 g/L) or greater.

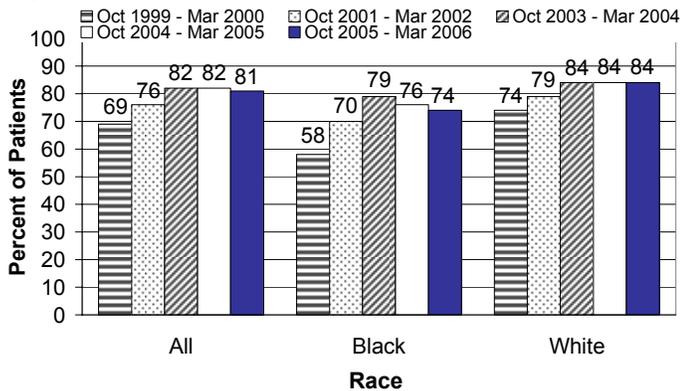
3. CPM and other Findings for October 2005–March 2006 compared to previous study periods

The percentage of peritoneal dialysis patients with mean hemoglobin ≥ 11 g/dL (110 g/L) increased from 62% to 81% from the 1999 to the 2006 study periods (FIGURE 8). This improvement was noted for both Black patients (from 58% to 74%) and for White patients (74% to 84%)

(FIGURE 43). The percentage of adult (aged ≥ 18 years) peritoneal dialysis patients with mean hemoglobin < 10 g/dL (100 g/L) decreased from 18% in the 1998 study period to 7% in the 2006 study period.

The mean ± SD hemoglobin increased from 11.8 ± 1.4 g/dL (118 ± 14 g/L) during the 2002 study period to 12.0 ± 1.3 g/dL (120 ± 13 g/L) during the 2006 study period (FIGURE 9).

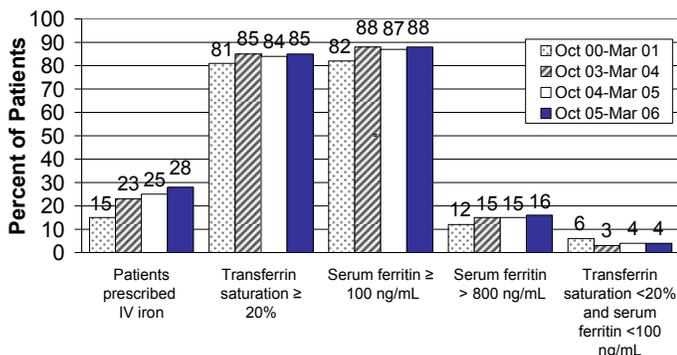
Figure 43: Percent of adult peritoneal dialysis patients with mean hemoglobin ≥ 11 g/dL, by race, October 2005–March 2006 compared to selected previous study periods. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 44 depicts the status of iron stores for the sampled patients for study period 2006 compared to selected previous study periods. Overall, 28% of patients were prescribed IV iron during the 2006 study period compared to 15% during the 2001 study period. Four percent of patients had a mean transferrin saturation < 20% and mean serum ferritin concentration < 100 ng/mL during the 2006 study period compared to 6% during the 2001 study period.

Figure 44: Percent of adult peritoneal dialysis patients with specific anemia management indicators, October 2005–March 2006 compared to selected previous study periods. 2006 ESRD CPM Project.



C. SERUM ALBUMIN

1. CPM Findings for October 2005–March 2006

Because serum albumin is not considered to be an official CPM for this Report, there are no CPM findings to report for this section.

TABLE 22: Mean hemoglobin values (g/dL) for adult peritoneal dialysis patients, by patient characteristics, October 2005–March 2006. 2006 ESRD CPM Project.

Patient Characteristic	Mean hemoglobin (g/dL)	Percent of patients with hemoglobin values					
		<10	10-10.9	11-11.9	12-12.9	13-13.9	14+
ALL	12.0	7	12	29	32	14	6
GENDER							
Males	12.2	5	10	27	35	15	8
Females	11.9	9	13	31	30	13	4
RACE							
American Indian/ Alaska Native	12.1	*	*	*	*	*	*
Asian/Pacific Islander	12.2	*	*	37	29	17	*
Black or African American	11.8	10	17	29	27	13	5
White	12.1	6	10	28	35	14	6
ETHNICITY							
Hispanic	12.0	*	13	29	38	11	*
Non-Hispanic	12.0	7	12	29	32	14	6
AGE GROUP (years)							
18-44	11.9	10	13	28	28	13	7
45-54	11.9	6	15	28	33	13	5
55-64	12.0	7	12	29	32	14	6
65-74	12.2	6	6	26	37	19	6
75+	12.1	*	9	37	34	11	*
CAUSE OF ESRD							
Diabetes Mellitus	12.0	6	12	29	34	14	5
Glomerulonephritis	11.9	7	11	30	34	14	*
Hypertension	12.1	5	14	28	32	15	6
Other/Unknown	12.0	9	11	29	29	14	8
DURATION OF DIALYSIS (years)							
< 0.5	12.1	8	10	27	33	18	*
0.5-0.9	12.3	*	9	27	39	16	7
1.0-1.9	12.0	5	14	29	31	16	4
2.0-2.9	11.9	8	10	30	37	11	*
3.0-3.9	12.0	*	9	37	28	12	*
4.0+	11.9	9	15	29	28	11	8
MEAN SERUM ALBUMIN (g/dL)							
≥ 3.5/3.2 BCG/BCP [^]	12.2	4	11	25	36	17	7
< 3.5/3.2 BCG/BCP [^]	11.7	11	13	37	26	9	4
MEAN WEEKLY CREATININE CLEARANCE (L/WEEK/1.73 m²)							
≥ 60	12.1	5	11	31	35	13	6
< 60	12.0	6	13	33	30	13	5

* value suppressed because n < 11

[^]Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods

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

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

2. Other Serum Albumin Findings for October 2005–March 2006

The mean ± SD serum albumin value for peritoneal dialysis patients when determined by the BCG method (n=1,338) was 3.6 ± 0.5 g/dL (36 ± 5 g/L) and when determined by the BCP method (n=70) was 3.3 ± 0.6 g/dL (34 ± 6 g/L) (APPENDIX 9). A serum albumin of ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) is the outcome goal. Nationally, 19% of patients had a mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP). 62% of patients had a mean serum albumin ≥ 3.5/3.2 g/dL (35/32 g/L) by BCG/BCP methods (TABLE 23).

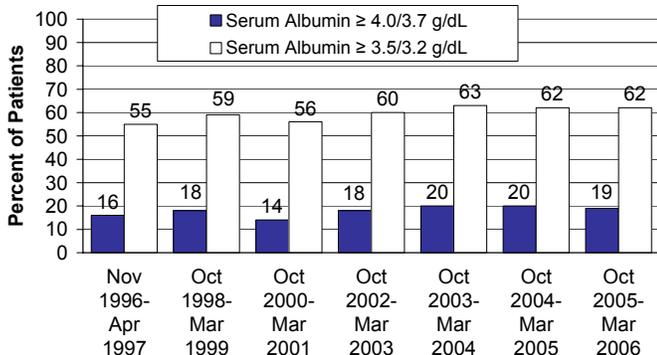
The percentage of patients with mean serum albumin values ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) by gender, race, ethnicity, age, diagnosis, duration of dialysis, and selected clinical parameters is shown in Table 23. The percentage of patients meeting the mean serum albumin outcome goal tended to be higher for men compared to women, for patients 18-44 years compared to older patients, for patients with causes of their ESRD other than diabetes mellitus compared to patients with diabetes mellitus as the cause, and for patients with mean hemoglobin ≥ 11 g/dL compared to patients with lower hemoglobin values (TABLE 23).

3. Findings for October 2005–March 2006 compared to previous study periods

Figure 45 shows the percentage of patients with mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) and the percentage of patients with mean serum albumin ≥ 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) during the 2006 study period compared to previous study periods.

There has been slight though inconsistent improvement in the proportion of adult peritoneal dialysis patients achieving a mean serum albumin of ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) from the 1997 study period to the 2006 study period.

Figure 45: Percent of adult peritoneal dialysis patients with mean serum albumin ≥ 4.0/3.7 g/dL (BCG/BCP)* and ≥ 3.5/3.2 g/dL (BCG/BCP), October 2005–March 2006 compared to previous study periods. 2006 ESRD CPM Project.



*Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods.
 Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

TABLE 23: Percent of adult in-center peritoneal patients with mean serum albumin values ≥ 4.0/3.7 g/dL (BCG/BCP)^ and ≥ 3.5/3.2 g/dL (BCG/BCP) in the U.S., by patient characteristics, October 2005–March 2006. 2006 ESRD CPM Project.

Patient Characteristic	Percent of Patients with Mean Serum Albumin	
	≥ 4.0/3.7 g/dL	≥ 3.5/3.2 g/dL
ALL	19	62
GENDER		
Men	22	65
Women	16	59
RACE		
American Indian/Alaska Native	*	*
Asian/Pacific Islander	26	73
Black or African American	17	57
White	19	64
ETHNICITY		
Hispanic	27	69
Non-Hispanic	18	61
AGE GROUP (years)		
18-44	35	75
45-54	18	66
55-64	15	56
65-74	9	55
75+	10	52
CAUSE OF ESRD		
Diabetes Mellitus	10	55
Glomerulonephritis	31	74
Hypertension	24	66
Other/Unknown	19	62
DURATION OF DIALYSIS (years)		
< 0.5	22	65
0.5-0.9	17	67
1.0-1.9	21	68
2.0-2.9	19	59
3.0-3.9	19	58
4.0+	15	57
MEAN Hgb (g/dL)		
≥ 11	20	65
< 11	15	51
MEAN WEEKLY CREATININE CLEARANCE (L/week/1.73m²)		
≥ 60	21	61
< 60	18	65
MODALITY		
CAPD	17	60
Cycler	20	67

* value suppressed because n<11

^Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

VII. PEDIATRIC IN-CENTER HEMODIALYSIS PATIENTS

All patients aged < 18 years identified as receiving in-center hemodialysis on December 31, 2005 were included in this study (n=803). 743 patients (93%) of this group met the case definition and were included in the sample for analysis. (See footnote to Table 5 on page 12 for case definition.)

At this time, CPMs have not been developed for the pediatric age group. Therefore, the pediatric analysis is presented independently of the adult analysis.

This section describes the findings for pediatric (aged < 18 years) in-center hemodialysis patients for core indicators related to urea clearance, vascular access, anemia management and serum albumin. Each subsection is further broken down into two parts:

- (1) National findings for selected core indicators for October-December 2005; and
- (2) A comparison of core indicator results or findings for October-December 2005 to previous study periods.

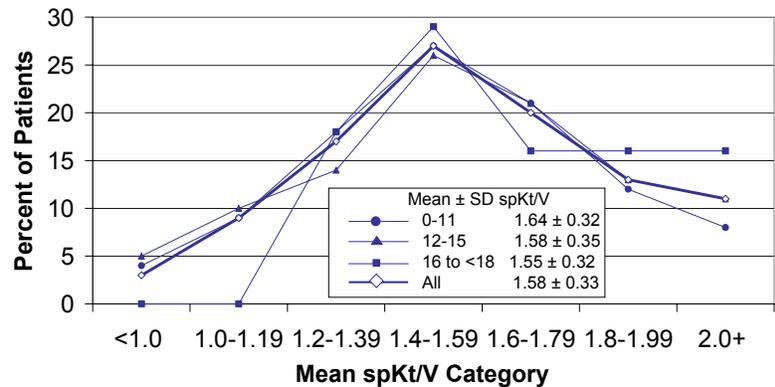
A. CLEARANCE

1. Findings for October–December 2005 (for patients < 18 years)

The percentage of patients in the sample for analysis with at least one calculated spKt/V measure available (n=743) who had a mean spKt/V ≥ 1.2 in the last quarter of 2005 was 88%. The mean \pm SD delivered, calculated, single-session spKt/V of all pediatric in-center hemodialysis patients in the sample for analysis in the last quarter of 2005 was 1.58 ± 0.33 (FIGURE 46). The distribution of spKt/V values for these patients by age is shown in Figure 46. The spKt/V was calculated using the Daugirdas II method; one blood sample was obtained after dialysis reflecting a single pool distribution (26). The mean \pm SD delivered calculated URR for this population was $73\% \pm 9\%$. 87% of patients had a mean delivered calculated URR $\geq 65\%$.

The mean spKt/V values and the percentage of patients with mean spKt/V ≥ 1.2 , for all patients by gender, race, ethnicity, age, dialysis session length, duration of dialysis, quintile of post-dialysis body weight, access type, and mean hemoglobin and serum albumin categories, are shown in Table 24.

Figure 46: Distribution of mean delivered, calculated, single-session spKt/V values for all pediatric (aged <18 years) in-center hemodialysis patients, by age group, October-December 2005. 2006 ESRD CPM Project.



A higher proportion of patients dialyzing six months or longer compared to patients dialyzing less than six months had a mean spKt/V ≥ 1.2 (92% vs. 72%), as did patients in the lowest quintile of post-dialysis body weight compared to patients in the highest quintile (95% vs. 72%), patients with dialysis sessions 240 minutes or longer compared to patients with dialysis sessions less than 180 minutes (94% vs. 72%), and patients with a mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) compared to patients who did not meet that target (89% vs. 82%).

The mean \pm SD time spent on dialysis per dialysis session was 202 ± 33 minutes. The mean time spent on dialysis was longer for males compared to females (206 minutes vs. 199 minutes), Blacks compared to Whites (205 minutes vs. 201 minutes), for patients aged 16 to < 18 years compared to patients aged 12 to 15 years and 0 to 11 years (209 minutes vs. 201 and 194 minutes, respectively), for patients dialyzing six months or longer compared to patients dialyzing less than six months (205 minutes vs. 191 minutes), for patients in the highest quintile of post-dialysis body weight compared to those patients in the lowest quintile (217 minutes vs. 191 minutes) and for patients dialyzing with an AVF compared to those patients with an AV graft or catheter access (210 minutes vs. 203 minutes and 199 minutes, respectively).

TABLE 24: Mean delivered calculated, single session spKt/V for all pediatric (aged <18 years) in-center hemodialysis patients and percent of patients with mean spKt/V ≥ 1.2, by patient characteristics, October-December 2005. 2006 ESRD CPM Project.

Patient Characteristics	Mean spKt/V	% spKt/V ≥ 1.2%
ALL	1.58	88
GENDER		
Males	1.53	86
Females	1.65	90
RACE		
American Indian/Alaska Native	1.79	88
Asian/Pacific Islander	1.70	95
Black or African American	1.51	86
White	1.62	90
Other/Unknown	*	*
ETHNICITY		
Hispanic	1.62	90
Non-Hispanic	1.57	87
AGE GROUP (years)		
0-4	1.69	100
5-9	1.61	94
10-14	1.59	86
15 to <18	1.56	87
DIALYSIS SESSION LENGTH (minutes)		
< 180	1.48	72
180 - 209	1.55	87
210 - 239	1.60	92
240 +	1.69	94
DURATION OF DIALYSIS (years)		
< 0.5	1.44	72
0.5-0.9	1.53	92
1.0-1.9	1.62	92
2.0-2.9	1.64	89
3.0-3.9	1.60	88
4.0+	1.67	95
QUINTILE POST-DIALYSIS BODY WEIGHT (kg)		
7.8 - 30.6	1.68	95
30.7 - 41.2	1.70	94
41.3 - 50.4	1.64	91
50.5 - 62.2	1.52	90
62.3 - 186.5	1.38	72
ACCESS TYPE		
AV Fistula	1.60	91
Graft with AVF	*	*
Graft without AVF	1.71	98
Catheter	1.55	85
MEAN Hgb (g/dL)		
≥ 11	1.57	89
< 11	1.60	86
MEAN SERUM ALBUMIN (g/dL)		
≥ 3.5/3.2 BCG/BCP [^]	1.59	89
< 3.5/3.2 BCG/BCP [^]	1.56	82

* value suppressed because n<11

[^]Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

2. Findings for October-December 2005 compared to previous study periods (for patients < 18 years)

The mean ± SD delivered spKt/V for patients aged < 18 years increased from 1.55 ± 0.32 in October-December 2002 to 1.58 ± 0.33 in October-December 2005. The percentage of these patients receiving dialysis with a mean delivered spKt/V ≥ 1.2 increased from 87% in late 2002 to 88% in late 2005.

Figure 47: Percent of all pediatric (aged < 18 years) male in-center hemodialysis patients with mean delivered, calculated, single session spKt/V ≥ 1.2, by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.

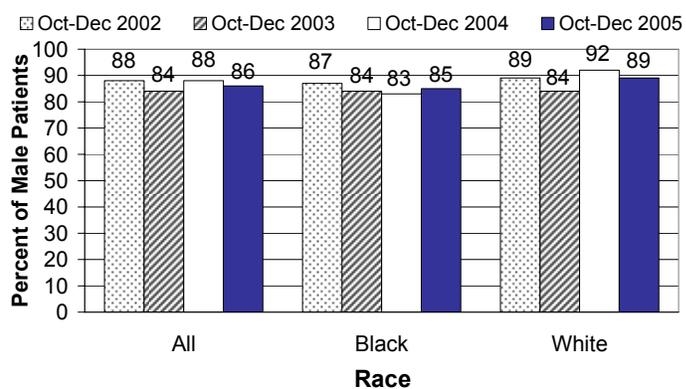
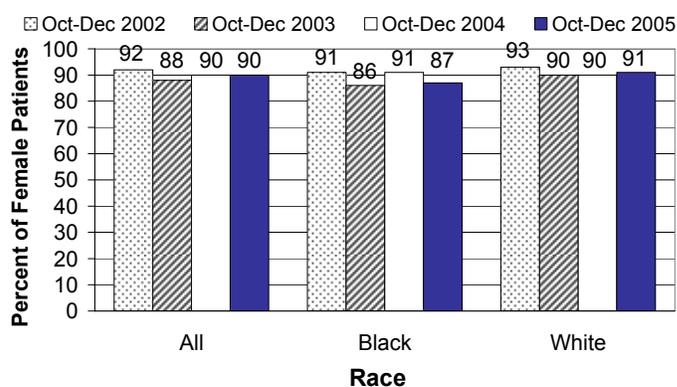


Figure 48: Percent of all pediatric (aged < 18 years) female in-center hemodialysis patients with mean delivered, calculated, single session spKt/V ≥ 1.2, by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



B. VASCULAR ACCESS

1. Findings for October-December 2005 (for patients < 18 years)

31% of patients were dialyzed with an AV fistula (AVF), 8% with an AV graft, and 61% with a catheter during October-December 2005 (TABLE 25). The percentage of patients with an AVF, AV graft and catheter by selected patient characteristics is shown in Table 25. Opportunities for improvement in the use of AVF exist for all groups.

TABLE 25: Vascular access type for all pediatric (aged < 18 years) in-center hemodialysis patients on their last hemodialysis session during October-December 2005, by selected patient characteristics. 2006 ESRD CPM Project.

Patient Characteristic	Percent of Patients with		
	AV Fistula	Graft **	Catheter
Total	31	8	61
GENDER			
Males	33	8	60
Females	29	8	63
RACE			
American Indian/Alaska Native	*		60
Asian/Pacific Islander	*	*	73
Black or African American	32	10	59
White	31	7	62
Other/Unknown	*		*
ETHNICITY			
Hispanic	36	6	59
Non-Hispanic	29	9	62
AGE GROUP (years)			
< 12	19	*	78
12 to <18	35	9	56
DURATION OF DIALYSIS (years)			
< 0.5	10	*	89
0.5-0.9	41	*	55
1.0-1.9	38	9	53
2.0-2.9	29	*	64
3.0-3.9	39	*	51
4.0+	34	17	49

* value suppressed because n<11

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

** Includes Grafts with and without AVF.

451 (61%) patients had a catheter as their current access in late 2005. In patients who had catheters for hemodialysis access, no AVF or AV graft was planned for 47% of the patients out of which more than half had no such permanent access was planned because of patient size, another 20% had no AVF or AV graft created at the end of 2005, and an AVF had been created but was not ready to cannulate for 11% (TABLE 26). 8% of patients were not candidates for AVF or AV graft placement as all sites had been exhausted.

Out of the 451 patients receiving dialysis through a catheter, 349 (47% of all patients) were dialyzed with a chronic catheter, defined as the continuous use of a catheter 90 days or longer, during October-December 2005 (TABLE 26).

58% of patients (166/290) with an AVF or an AV graft had their access routinely monitored for stenosis. (See Appendix 1 for a complete description of the types of

stenosis monitoring.) Within this subset of patients, 40% were monitored with dynamic venous pressure, 12% with static venous pressure, 16% with the dilution technique, and 19% with other types of monitoring (groups not mutually exclusive).

TABLE 26: Reasons for catheter placement in all pediatric (aged < 18 years) in-center hemodialysis patients using catheters on their last hemodialysis session during October-December 2005. 2006 ESRD CPM Project.

Reason	n	%
Total	451	(100)
No fistula or graft surgically planned	211	(47)
Patient size too small for AV fistula/graft	114	
Peripheral vascular disease	*	
Patient preference	40	
Physician/Surgeon preference	57	
Renal transplantation scheduled	51	
Fistula maturing, not ready to cannulate	51	(11)
Graft maturing, not ready to cannulate	*	
No fistula or graft surgically created at this time	92	(20)
Useable fistula or graft sites have been exhausted	35	(8)
Temporary interruption of fistula due to clotting or revisions	*	
Temporary interruption of graft due to clotting or revisions	*	
Other	47	(10)

* value suppressed because n<11

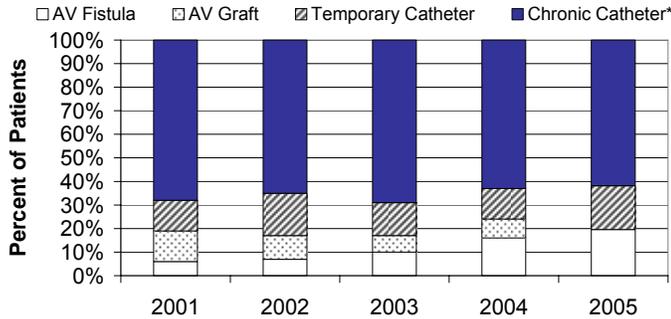
Note: Percentages may not add up to 100% due to rounding.

2. Findings for October-December 2005 compared to previous study periods (for patients < 18 years)

A higher percentage of patients aged 11 years or younger was dialyzed with an AVF in late 2005 compared to late 2001 (19% vs. 6%) (FIGURE 49). A slightly lower percentage of patients was dialyzed with a catheter in late 2005 compared to late 2002 (78% vs. 83%), though temporary catheter use has increased since 2004 (13% vs. 18%) (FIGURE 49). Fewer patients were dialyzed with a chronic catheter for 90 days or longer in late 2005 compared to late 2002 (65% in 2002 and 60% in 2005).

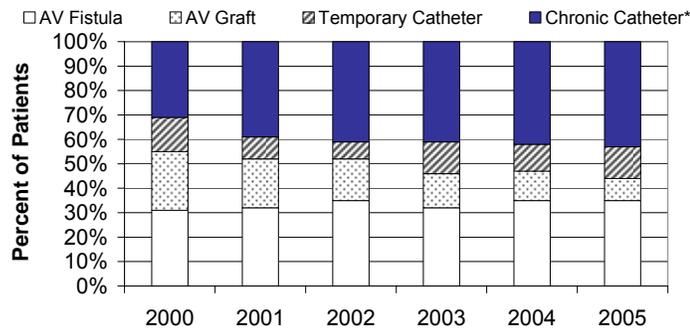
The trend for vascular access use among patients aged 12 to < 18 years is shown in Figure 50. A higher percentage of patients in this age group had an AV fistula as their vascular access in late 2005 compared to patients aged 0-11 years (35% vs. 19%, respectively). Chronic catheter use was lower among patients aged 12 to < 18 years compared to patients aged 0 to 11 years in late 2005 (43% vs. 60%, respectively) (FIGURES 49, 50). AV Fistula use among patients 12 to <18 years old has increased since late 2001 (35% vs. 31%). However, chronic catheter use in this age group has also increased since late 2000 (43% vs. 31%), whereas AV Graft use has decreased since late 2000 (24% vs. 9%).

Figure 49: Vascular access type for pediatric (<12 years) in-center hemodialysis patients on their last hemodialysis session during the study period, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



*Chronic catheter use defined as continuous catheter use 90 days or longer.

Figure 50: Vascular access type for pediatric (aged 12 to < 18 years) in-center hemodialysis patients on their last hemodialysis session during the study period, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



*Chronic catheter use defined as continuous catheter use 90 days or longer.

C. ANEMIA MANAGEMENT

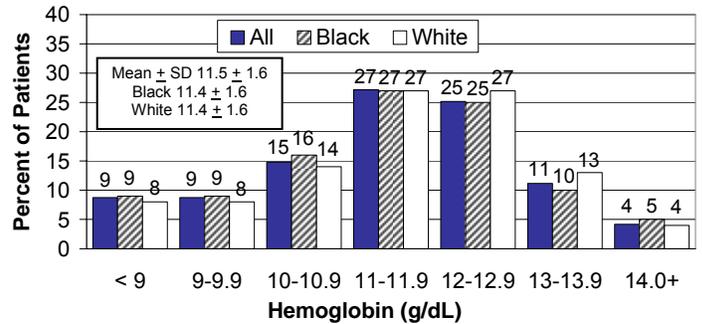
1. Findings for October-December 2005 (for patients < 18 years)

The mean ± SD hemoglobin for all patients in the sample was 11.5 ± 1.6 g/dL (115 ± 16 g/L) (FIGURES 12, 51, TABLE 27). The distributions of mean hemoglobin values for all patients, and by race, are shown in Figure 51. The mean hemoglobin values and distribution of hemoglobin values by gender, race, ethnicity, age, duration of dialysis, access type, and mean spKt/V and serum albumin concentrations are shown in Table 27.

The percentage of patients with mean hemoglobin < 9 g/dL (90 g/L) was 9%. The percentage of patients with mean hemoglobin < 10 g/dL (100 g/L) was 18%. The prevalence of patients with mean hemoglobin <10 g/dL (100 g/L) was higher in the younger age groups. The mean hemoglobin level was also progressively lower with a progressively younger age group. The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was higher in patients dialyzing less than six months compared to those patients

dialyzing six months or longer and higher in patients with a catheter or an AV graft access compared to patients dialyzing with an AVF. A higher percentage of patients with a mean serum albumin < 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) compared to patients with higher serum albumin values had a mean hemoglobin < 10 g/dL (100 g/L) (TABLE 27).

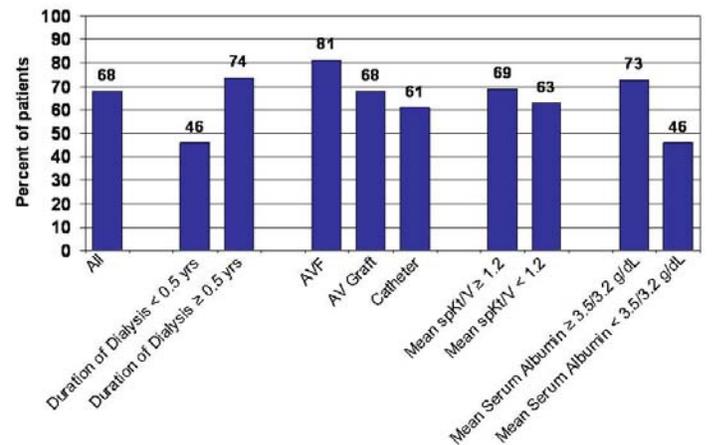
Figure 51: Distribution of mean hemoglobin values (g/dL) for all pediatric (aged < 18 years) in-center hemodialysis patients, by race, October-December 2005. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

68% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L). The percentage of patients with mean hemoglobin ≥ 11 g/dL (110 g/L) by selected patient characteristics is shown in Figure 52.

Figure 52: Percent of all pediatric (aged < 18 years) in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by selected patient characteristics and clinical parameters, October-December 2005. 2006 ESRD CPM Project.



Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/dL), multiply by 10.

TABLE 27: Mean hemoglobin values (g/dL) and distribution of hemoglobin values for all pediatric (aged < 18 years) in-center hemodialysis patients, by patient characteristics, October-December 2005. 2006 ESRD CPM Project.

Patient Characteristic	Mean hemoglobin (g/dL)	Percent of patients with hemoglobin values						
		<9	9-9.9	10-10.9	11-11.9	12-12.9	13-13.9	14+
ALL	11.5	9	9	15	27	25	11	4
GENDER								
Males	11.5	8	10	16	24	26	12	5
Females	11.4	10	7	13	31	24	11	3
RACE								
American Indian/Alaska Native	12.1	*	*	*	*	*	*	*
Asian/Pacific Islander	10.5	*	*	*	*	*	*	*
Black or African American	11.4	9	9	16	27	25	10	5
White	11.6	8	8	14	27	27	13	4
Other/Unknown	*	*	*	*	*	*	*	*
ETHNICITY								
Hispanic	11.6	8	7	11	30	28	13	*
Non-Hispanic	11.4	9	9	17	26	24	10	4
AGE GROUP (years)								
0-4	10.6	*	*	29	*	*	*	*
5-9	10.8	20	*	16	30	15	*	*
10-14	11.5	7	10	16	30	24	9	*
15 to < 18	11.7	7	7	12	26	29	14	5
DURATION OF DIALYSIS (years)								
< 0.5	10.7	16	17	21	22	15	*	*
0.5-0.9	12.0	*	*	12	26	26	18	*
1.0-1.9	11.8	*	9	13	28	32	12	*
2.0-2.9	11.5	*	*	*	29	34	*	*
3.0-3.9	11.6	*	*	*	21	21	*	*
4.0+	11.6	7	6	15	33	25	11	*
ACCESS TYPE								
AV Fistula	12.0	*	*	12	27	36	12	7
Graft with AVF	*	*	*	*	*	*	*	*
Graft without AVF	11.7	*	24	29	31	*	*	*
Catheter	11.2	12	11	15	27	20	11	3
MEAN spKt/V								
≥ 1.2	11.5	9	7	15	27	27	11	4
< 1.2	11.4	*	14	*	23	22	*	*
MEAN SERUM ALBUMIN (g/dL)								
≥ 3.5/3.2 BCG/BCP^	11.7	6	7	14	28	28	12	5
< 3.5/3.2 BCG/BCP^	10.7	20	15	19	23	14	8	*

* value suppressed because n < 11

^Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods

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

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

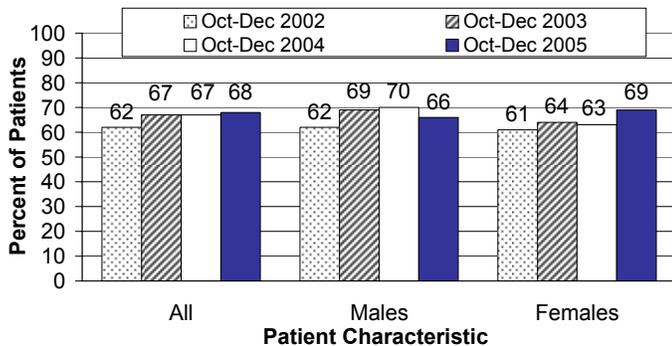
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

The mean ± SD transferrin saturation for these patients was 29 ± 14%. 74% of patients had a mean transferrin saturation ≥ 20% (FIGURE 55). The mean ± SD serum ferritin concentration was 471 ± 471 ng/mL. 83% of patients had a mean serum ferritin concentration ≥ 100 ng/mL; 17% of patients had a mean serum ferritin concentration > 800 ng/mL during the study period. 8% of patients had a mean transferrin saturation < 20% and a mean serum ferritin < 100 ng/mL.

2. Findings for October-December 2005 compared to previous study periods (for patients < 18 years)

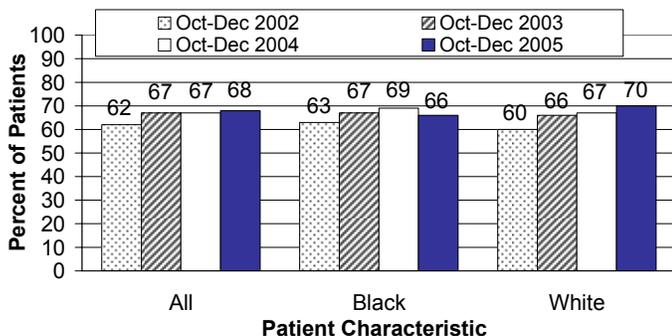
The mean ± SD hemoglobin for patients aged 0 to < 18 increased from 11.2 ± 1.6 g/dL (112 ± 16 g/L) to 11.5 ± 1.6 (115 ± 16 g/L) from late 2001 to late 2005. 62% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L) in late 2001 and 68% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L) in late 2005 (FIGURES 53, 54). 17% of patients aged 18 years or younger had a mean hemoglobin < 10 g/dL (100 g/L) in late 2005 compared to 20% in late 2002. Trends in iron management indicators for pediatric patients < 18 years are shown in Figure 55.

Figure 53: Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by gender, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



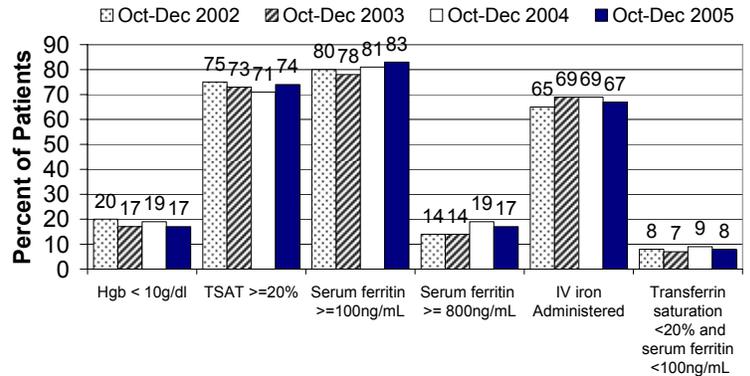
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 54: Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 55: Percent of pediatric (aged < 18 years) in-center hemodialysis patients with specific anemia management indicators, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

D. SERUM ALBUMIN

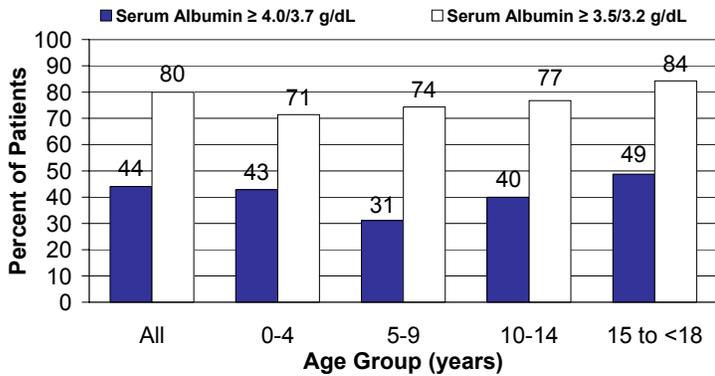
1. Findings for October-December 2005 (for patients < 18 years)

The mean ± SD serum albumin value for pediatric patients when determined by the BCG method (n=611) was 3.9 ± 0.5 g/dL (39 ± 5 g/L), and when determined by the BCP method (n=132) was 3.5 ± 0.5 g/dL (35 ± 6 g/L). Figure 56 shows the percentage of pediatric patients with mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) and ≥ 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) by age group. Nationally, 44% of patients had a mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP). 80% of patients had a mean serum albumin ≥ 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP). The percentage of patients with mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) and ≥ 3.5/3.2 g/dL (35/32 g/L) (BCG/BCP) by gender, race, ethnicity, age, duration of dialysis, access type, and mean delivered spKt/V and hemoglobin categories is shown in Table 28. The percentage of patients with mean serum albumin ≥ 4.0/3.7 g/dL (40/37 g/L) (BCG/BCP) tended to be higher for males, Whites, Hispanics, patients dialyzing 6 months or longer compared to patients dialyzing less than 6 months, for patients dialyzing with either an AVF or an AV graft compared to catheters, and for patients with a mean hemoglobin ≥ 11 g/dL (110 g/L) compared to patients with lower mean hemoglobin values.

2. Findings for October-December 2005 compared to previous study periods (for patients < 18 years)

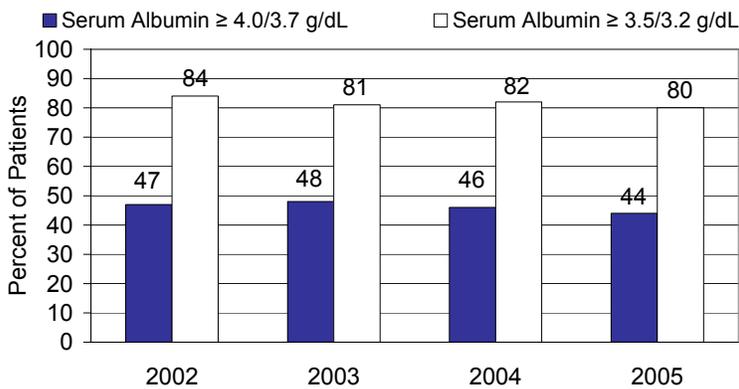
There has been little change in the percentage of pediatric patients aged < 18 years achieving mean serum albumin targets from late 2002 to late 2005 (FIGURE 57).

Figure 56: Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* and $\geq 3.5/3.2$ g/dL (BCG/BCP), by age, October-December 2005. 2006 ESRD CPM Project.



*BCG/BCP = bromocresol green/bromocresol purple laboratory methods.
 Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 57: Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* and $\geq 3.5/3.2$ g/dL (BCG/BCP), October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.



*BCG/BCP = bromocresol green/bromocresol purple laboratory methods.
 Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

TABLE 28: Percent of all pediatric (aged < 18 years) in-center hemodialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP)^ and $\geq 3.5/3.2$ g/dL (BCG/BCP) in the U.S., by patient characteristics, October-December 2005. 2006 ESRD CPM Project.

Patient Characteristic	Percent of Patients with Mean Serum Albumin	
	$\geq 4.0/3.7$ g/dL	$\geq 3.5/3.2$ g/dL
ALL	44	80
GENDER		
Males	50	84
Females	38	76
RACE		
American Indian/Alaska Native	*	75
Asian/Pacific Islander	*	73
Black or African American	39	80
White	49	82
Other/Unknown	*	*
ETHNICITY		
Hispanic	50	85
Non-Hispanic	41	78
AGE GROUP (years)		
0-4	43	71
5-9	31	74
10-14	40	77
15 to < 18	49	84
DURATION of DIALYSIS (years)		
< 0.5	32	66
0.5-0.9	51	82
1.0-1.9	47	85
2.0-2.9	49	84
3.0-3.9	52	85
4.0+	43	85
ACCESS TYPE		
AV Fistula	57	89
Graft **	51	90
Catheter	37	75
Catheter ≥ 90 days	39	79
MEAN spKt/V		
≥ 1.2	44	82
< 1.2	43	71
MEAN Hgb (g/dL)		
≥ 11	50	87
< 11	31	67

*value suppressed because n < 11

** Includes grafts with and without AVF

^Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods.

Note: Percentages may not add up to 100% due to rounding

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

VIII. PEDIATRIC PERITONEAL DIALYSIS PATIENTS

This is the second year that data were collected for pediatric peritoneal dialysis patients. All patients aged < 18 years identified as receiving peritoneal dialysis on December 31, 2005 were included in this study (n = 807). 781 patients (97%) of this group met the case definition and were included in the sample for analysis. (See footnote to Table 6 on page 12 for case definition.)

At this time, CPMs have not been developed for the pediatric age group. Therefore, the pediatric analysis is presented independently of the adult analysis.

This section describes the national findings for pediatric (aged < 18 years) peritoneal dialysis patients for core indicators related to peritoneal dialysis clearance, anemia management and serum albumin. Each subsection is further broken down into two parts:

- (1) National findings for selected core indicators for October 2005-March 2006; and
- (2) A comparison of core indicator results or findings for October 2005-March 2006 to the previous study period.

A. CLEARANCE

1. Findings for October 2005 – March 2006 (for patients < 18 years)

There were 21 patients categorized as CAPD patients and 540 patients categorized as CCPD or cycler patients during the study period. Tidal peritoneal dialysis patients (n = 49) were excluded from the peritoneal dialysis clearance analyses reported below. By using values abstracted from medical records of peritoneal dialysis patients, it was possible to calculate at least one of the clearance measures (weekly Kt/V_{urea} or weekly creatinine clearance) for 470 (64%) of the 732 patients included for these analyses during the 2006 study period. For calculated clearance measures, total body water was calculated using a formula validated for pediatric peritoneal dialysis patients (32).

Table 29 depicts the percentage of CAPD and cycler patients with a mean calculated weekly Kt/V_{urea} and a mean calculated weekly creatinine clearance meeting certain targets. 71% of cycler patients had a mean calculated weekly Kt/V_{urea} and 23% had a mean calculated weekly creatinine clearance that met certain targets during the 2006 study period (TABLE 29).

Table 30 presents the distribution of peritoneal equilibration test results. Only 130 pediatric PD patients underwent peritoneal equilibration testing. The distribution appears to follow a normal curve with the majority of patients following a pattern of low average to high average PET results.

TABLE 29: Description of peritoneal dialysis clearance for pediatric (aged < 18 years) peritoneal dialysis patients, by modality. October 2005 - March 2006. 2006 ESRD CPM Project.

Weekly Kt/V	CAPD Patients ≥ 2.0	Cycler Patients ≥ 2.1
% meeting NKF - KDOQI	67%	71%
Mean ± SD	2.43 ± 0.64	2.53 ± 0.77
Median	2.46	2.44

Weekly Creatinine Clearance (L/week/1.73m ²)	CAPD Patients ≥ 63	Cycler Patients ≥ 66
% meeting NKF - KDOQI	50%	23%
Mean ± SD	68.36 ± 25.75	52.79 ± 22.56
Median	61.2	47.3

* value suppressed because n<11

For CAPD patients, the delivered PD dose target was a weekly Kt/V_{urea} ≥ 2.0 a weekly creatinine clearance ≥ 60 L/week/1.73m²

For Cycler patients, the target was a weekly Kt/V_{urea} ≥ 2.1 and a weekly creatinine clearance ≥ 63 L/week/1.73m²

TABLE 30: Distribution of Peritoneal Equilibration Test (PET) results for pediatric (aged < 18) peritoneal dialysis patients, October 2005-March 2006. 2006 ESRD CPM Project.

	n	(%)
Low (0.34-0.49)	22	(17)
Low-Average (0.50-0.64)	41	(32)
High-Average (0.65-0.81)	46	(35)
High (0.82-1.03)	21	(16)

2. Findings for October 2005 – March 2006 compared to the previous study period (for patients < 18 years)

The mean ± SD weekly Kt/V_{urea} for patients aged < 18 years was 2.46 ± 0.75 for CAPD patients, 2.54 ± 0.75 for cycler patients with a daytime dwell and 2.36 ± 0.93 for cycler patients without a daytime dwell in the 2005 study period. This compares to 2.43 ± 0.64 for CAPD patients and 2.53 ± 0.77 for cycler patients in the 2006 study period.

The percentages of patients meeting the weekly Kt/V_{urea} target in the 2005 study period were 65% of CAPD patients, 72% of cycler patients with a daytime dwell and 63% of cycler patients without a daytime dwell. This compares to 67% of CAPD patients and 71% of cycler patients in the 2006 study period. (Note: For the October 2005-March 2006 collection period, CCPD and NIPD were not distinguishable.)

The mean ± SD weekly creatinine clearance for patients aged < 18 years was 62.1 ± 34.3 for CAPD patients, 53.8 ±

21.9 for cycler patients with a daytime dwell and 53.2 ± 30.6 for cycler patients without a daytime dwell in the 2005 study period. This compares to 68.36 ± 25.75 for CAPD patients and 52.79 ± 22.56 for cycler patients in the 2006 study period.

24% of cycler patients with a daytime dwell met the weekly creatinine clearance target in the 2005 study period, compared to 23% of cycler patients in the 2006 study period. There were not enough CAPD patients or cycler patients without a daytime dwell to calculate this statistic in the 2005 study period.

B. ANEMIA MANAGEMENT

1. Findings for October 2005 – March 2006 (for patients < 18 years)

The mean \pm SD hemoglobin for pediatric (aged < 18 years) peritoneal dialysis patients was 11.6 ± 1.4 g/dL (116 ± 14 g/L). The distributions of mean hemoglobin values for all patients and by race and ethnicity are shown in Figures 58 and 59. The mean hemoglobin values and the proportion of patients within different hemoglobin categories for gender, race, ethnicity, age, diagnosis, duration of dialysis, mean serum albumin value and weekly Kt/V_{urea} are shown in Table 31. Nationally, 71% of patients had a mean hemoglobin ≥ 11 g/dL (110 g/L). Significantly more Whites and Hispanic patients had a mean hemoglobin ≥ 11 g/dL compared to Blacks and non-Hispanic patients (TABLE 31). A larger percentage of patients with higher mean serum albumin values had a mean hemoglobin ≥ 11 g/dL (110 g/L) compared to patients with lower mean serum albumin values. Nationally, 56% of patients prescribed ESAs had a mean hemoglobin 11-12.9 g/dL (110-129 g/L). There was no clear relationship between mean hemoglobin target measures and patient age, duration of peritoneal dialysis, or etiology of ESRD.

The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was 12% (FIGURES 58, 59, and TABLE 31). The prevalence of patients with mean hemoglobin < 10 g/dL (100 g/L) was significantly higher among Blacks compared to Whites (21% vs. 10%), among non-Hispanic patients compared to Hispanic patients (13% vs. 8%), and among patients with lower mean serum albumin values compared to patients with higher mean serum albumin values (18% vs. 8%) (TABLE 31).

The mean \pm SD transferrin saturation for all patients was 30 ± 13 and 78% of patients had mean transferrin saturation $\geq 20\%$. The mean \pm SD serum ferritin concentration was 295 ± 319 ng/mL, with 72% of patients having a mean serum ferritin concentration ≥ 100 ng/mL and 8% of patients having mean serum ferritin > 800 ng/mL. 63 patients (9% of patients) had both a mean transferrin saturation < 20% and a mean serum ferritin concentration < 100 ng/mL.

98% of patients were prescribed ESAs during the six-month study period. ESAs were prescribed 100% of the

time when the mean hemoglobin values were < 10 g/dL (100 g/L), 100% of the time when the mean hemoglobin values were 10-10.9 g/dL (100-109 g/L), 99% of the time when mean hemoglobin values were 11-11.9 g/dL (110-119 g/L), 96% of the time when mean hemoglobin values were 12-12.9 g/dL (120-129 g/L), 94% of the time when mean hemoglobin values were 13-13.9 g/dL (130-139 g/L), and 88% of the time when mean hemoglobin values were 14 g/dL (140 g/L) or greater.

Iron by either the oral or IV route was prescribed at least once during the six months for 87% of the patients in this sample, and three times over the six-month study period for 68% of the patients. Overall, 12% of patients were prescribed IV iron. Of the patients prescribed iron, 92% were prescribed oral iron and 14% were prescribed IV iron (not mutually exclusive categories). Among those patients with mean transferrin saturation < 20% and mean serum ferritin < 100 ng/mL ($n=63$), 92% were prescribed either oral or IV iron at least once during the six months, and 78% three times over the six-month study period.

2. Findings for October 2005 – March 2006 compared to the previous study period (for patients < 18 years)

The percentage of pediatric (aged < 18 years) peritoneal dialysis patients with mean hemoglobin ≥ 11 g/dL (110 g/L) increased from 69% to 71% from the 2005 study period to the 2006 study period. This improvement was noted for Black patients (from 55% to 60%) while there was no change for White patients (74%). The percentage of pediatric peritoneal dialysis patients with mean hemoglobin < 10 g/dL (100 g/L) decreased from 14% in the 2005 study period to 12% in the 2006 study period. The mean \pm SD hemoglobin of 11.6 ± 1.5 g/dL (116 ± 15 g/L) was the same in both the 2005 and 2006 study periods.

Overall, 12% of pediatric patients were prescribed IV iron during the 2006 study period, a slight increase compared to 11% during the 2005 study period. Nine percent of patients had a mean transferrin saturation < 20% and mean serum ferritin concentration < 100 ng/mL during the 2006 study period, an increase compared to 7% of patients during the 2005 study period.

C. SERUM ALBUMIN

1. Findings for October 2005 – March 2006 (for patients < 18 years)

The mean \pm SD serum albumin value for pediatric (aged < 18 years) peritoneal dialysis patients when determined by the BCG method ($n=652$) was 3.6 ± 0.6 g/dL (36 ± 6 g/L) and when determined by the BCP method ($n=128$) was 3.4 ± 0.5 g/dL (34 ± 5 g/L). Nationally, 26% of patients had a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP). 63% of patients had a mean serum albumin $\geq 3.5/3.2$ g/dL (35/32 g/L) by the BCG/BCP method (TABLE 32).

TABLE 31: Mean hemoglobin values (g/dL) and distribution of hemoglobin values for all pediatric (aged < 18 years) peritoneal dialysis patients, by patient characteristics, October-March 2006. 2006 ESRD CPM Project.

Patient Characteristic	Mean hemoglobin (g/dL)	Percent of patients with hemoglobin values						
		<9	9-9.9	10-10.9	11-11.9	12-12.9	13-13.9	14+
ALL	11.6	4	8	17	30	26	11	4
GENDER								
Males	11.7	4	8	14	30	28	12	4
Females	11.5	5	8	21	29	23	10	4
RACE								
American Indian/Alaska Native	*	*	*	*	*	*	*	*
Asian/Pacific Islander	12.1	*	*	*	*	*	*	*
Black or African American	11.2	9	12	19	29	20	9	*
White	11.8	3	7	16	30	27	12	5
ETHNICITY								
Hispanic	11.9	*	7	14	31	30	11	6
Non-Hispanic	11.5	5	8	18	29	24	11	4
AGE GROUP (years)								
0-4	11.6	*	7	20	31	26	11	*
5-9	11.4	*	*	20	29	25	*	*
10-14	11.7	5	7	15	31	26	11	5
15 to <18	11.6	*	11	16	27	26	12	*
CAUSE OF ESRD								
Congenital/Urologic	11.7	4	7	18	28	28	11	4
Other Causes Combined	11.6	4	9	17	31	24	11	5
DURATION OF DIALYSIS (years)								
< 0.5	11.8	*	9	19	27	23	16	*
0.5-0.9	11.9	*	*	17	31	30	11	*
1.0-1.9	11.4	6	7	17	34	27	7	*
2.0-2.9	11.5	*	*	18	20	28	*	*
3.0-3.9	11.4	*	*	*	37	22	*	*
4.0+	11.5	*	12	17	30	22	11	*
MEAN WEEKLY Kt/V_{urea}								
≥2.0	11.7	3	6	16	30	28	12	4
< 2.0	11.7	*	10	15	35	21	13	*
MEAN SERUM ALBUMIN (g/dL)								
≥ 3.5/3.2 BCG/BCP [^]	11.8	3	5	15	31	28	13	5
< 3.5/3.2 BCG/BCP	11.3	6	12	20	28	22	8	*

* value suppressed because n<11

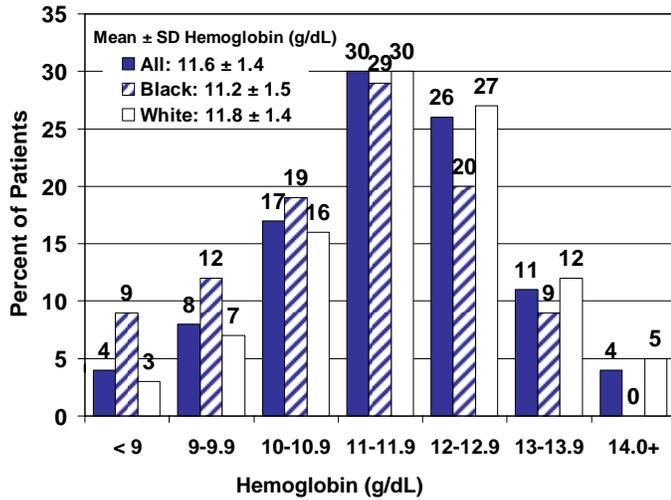
[^]Note: BCG/BCP = bromocresol green/bromocresol purple laboratory methods

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

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

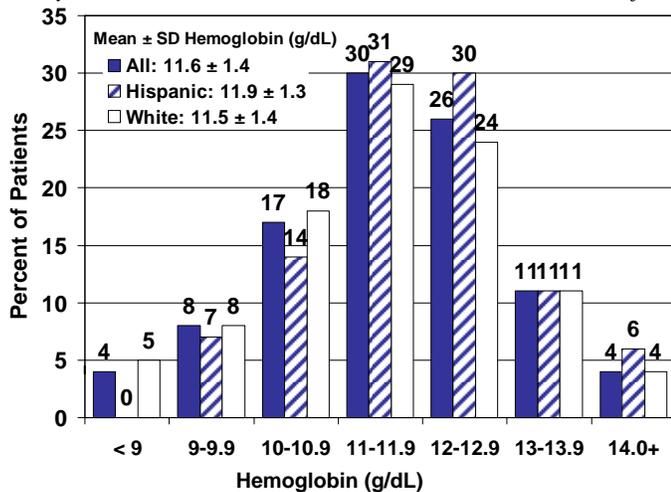
Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 58: Distribution of mean hemoglobin values (g/dL) for all pediatric (aged < 18 years) peritoneal dialysis patients, by race, October 2005–March 2006. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Figure 59: Distribution of mean hemoglobin values (g/dL) for all pediatric (aged < 18 years) peritoneal dialysis patients, by ethnicity, October 2005 – March 2006. 2006 ESRD CPM Project.



Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

The percentage of patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (40/37 g/L) and $\geq 3.5/3.2$ g/dL (35/32 g/L) (BCG/BCP) by gender, race, ethnicity, age, diagnosis, duration of dialysis, and selected clinical parameters is shown in Table 32. The percentage of patients with a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) tended to be higher for females compared to males, for White patients compared to Black patients, for Hispanics compared to non-Hispanics, and for patients 15 to < 18 years compared to younger patients (TABLE 32). A higher percentage of patients with higher mean hemoglobin values tended to have a mean serum albumin $\geq 4.0/3.7$ g/dL (40/37 g/L) goal compared to patients with lower mean hemoglobin values.

2. Findings for October 2005 – March 2006 compared to the previous study period (for patients < 18 years)

The proportion of pediatric (aged < 18 years) peritoneal dialysis patients achieving a mean serum albumin of $\geq 4.0/3.7$ g/dL (40/37 g/L) (BCG/BCP) decreased from 33% in the 2005 study period to 26% in the 2006 study period.

TABLE 32: Percent of all pediatric (aged < 18 years) peritoneal dialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP)^ and $\geq 3.5/3.2$ g/dL (BCG/BCP) in the U.S., by patient characteristics, October 2005 - March 2006. 2006 ESRD CPM Project.

Patient Characteristic	Percent of Patients with Mean Serum Albumin	
	$\geq 4.0/3.7$ g/dL	$\geq 3.5/3.2$ g/dL
ALL	26	63
GENDER		
Males	26	63
Females	27	63
RACE		
American Indian/Alaska Native	*	*
Asian/Pacific Islander	*	70
Black or African American	21	58
White	29	65
ETHNICITY		
Hispanic	37	70
Non-Hispanic	22	60
AGE GROUP (years)		
0-4	18	52
5-9	17	53
10-14	26	65
15 to <18	40	76
CAUSE OF ESRD		
Other Causes Combined	29	65
Congenital/Urologic	22	60
DURATION OF DIALYSIS		
< 0.5	26	56
0.5-0.9	26	63
1.0-1.9	29	66
2.0-2.9	33	74
3.0-3.9	23	60
4.0+	17	59
MEAN Hgb (g/dL)		
≥ 11	31	68
< 11	16	51
MEAN WEEKLY Kt/V_{urea}		
≥ 2.0	29	66
< 2.0	26	59
MODALITY		
CAPD	*	67
Cycler	27	65

* value suppressed because n<11

^Note: BCG/BCP = bromcresol green/bromcresol purple laboratory methods
Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

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X. List of Tables and Figures

Table	Title	Page
1.	Number of adult in-center hemodialysis patients in each Network in December 2005, sample size and response rate for the 2006 ESRD CPM Project.	9
2.	Characteristics of adult in-center hemodialysis patients in the 2006 ESRD CPM Project compared to those of all in-center hemodialysis patients in the U.S. in 2004.	10
3.	Number of adult peritoneal dialysis patients in each Network in December 2005, sample size and response rate for the 2006 ESRD CPM Project.	11
4.	Characteristics of adult peritoneal dialysis patients in the 2006 ESRD CPM Project compared to those of all peritoneal dialysis patients in the U.S. in 2004.	11
5.	Characteristics of pediatric (aged < 18 years) in-center hemodialysis patients in the 2006 ESRD CPM Project.	12
6.	Characteristics of pediatric (aged < 18 years) peritoneal dialysis patients in the 2006 ESRD CPM Project.	12
7.	Mean delivered calculated, single session spKt/V and percent of adult in-center hemodialysis patients with mean delivered calculated, single session spKt/V ≥ 1.2 and ≥ 1.3 by patient characteristics, October-December 2005. 2006 ESRD CPM Project.	26
8.	Percent of adult in-center hemodialysis patients receiving dialysis with a mean delivered, single session spKt/V ≥ 1.2 , by gender, race, ethnicity, body weight, dialysis session length and Network, October-December 2005. 2006 ESRD CPM Project.	27
9.	Vascular access type for incident and all adult in-center hemodialysis patients during the last hemodialysis session of the study period, by selected patient characteristics, October-December 2005. 2006 ESRD CPM Project.	29
10.	Percent of all adult in-center hemodialysis patients with an AV fistula access on their last hemodialysis session during October–December 2005, by gender, race, ethnicity, age, cause of ESRD, and Network. 2006 ESRD CPM Project.	32
11.	Percent of all adult in-center hemodialysis patients with a catheter access on their last hemodialysis session during October–December 2005, by gender, race, ethnicity, age, cause of ESRD, and Network. 2006 ESRD CPM Project.	33
12.	Reasons for catheter placement in adult in-center hemodialysis patients using catheters on their last hemodialysis session during October-December 2005. 2006 ESRD CPM Project.	34
13.	Reasons for catheter placement in adult in-center hemodialysis patients using catheters on their last hemodialysis session during October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	34
14.	Mean hemoglobin values (g/dL) for adult in-center hemodialysis patients in the U.S., by patient characteristics, October–December 2005. 2006 ESRD CPM Project.	37
15.	Percent of all adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by gender, race, ethnicity, age, access type, mean serum albumin, and Network, October-December 2005. 2006 ESRD CPM Project.	38
16.	Regional variation for various anemia management measures for adult in-center hemodialysis patients including the percent of patients with mean hemoglobin ≥ 11 g/dL, mean hemoglobin (g/dL), and mean serum albumin ≥ 4.0 (BCG) for these patients nationally and by Network, October-December 2005. 2006 ESRD CPM Project.	40

Table	Title	Page
17.	Percent of adult in-center hemodialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP) in the U.S., by patient characteristics, October-December 2005. 2006 ESRD CPM Project.	42
18.	Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP method) by gender, race, ethnicity, age, cause of ESRD, access type, mean spKt/V, mean hemoglobin, and Network, October-December 2005. 2006 ESRD CPM Project.	43
19.	Distribution of Peritoneal Equilibration Test (PET) results for adult peritoneal dialysis patients by modality, October 2005-March 2006. 2006 ESRD CPM Project.	46
20.	Percent of adult CAPD patients with mean \pm SD weekly adequacy values meeting 2000 NKF-/DOQI guidelines and median adequacy values, by transporter type (4 hr. D/P Cr Ratio), October 2005–March 2006. 2006 ESRD CPM Project.	47
21.	Percent of adult cycler patients with mean \pm SD weekly adequacy values meeting 2000 NKF-K/DOQI guidelines and median adequacy values, October 2005–March 2006. 2006 ESRD CPM Project.	47
22.	Mean hemoglobin values (g/dL) for adult peritoneal dialysis patients, by patient characteristics, October 2005-March 2006. 2006 ESRD CPM Project.	49
23.	Percent of adult peritoneal dialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP) in the U.S., by patient characteristics, October 2005-March 2006. 2006 ESRD CPM Project.	50
24.	Mean delivered calculated, single session spKt/V for all pediatric (aged < 18 years) in-center hemodialysis patients and percent of patients with mean spKt/V ≥ 1.2 , by patient characteristics, October-December 2005. 2006 ESRD CPM Project.	52
25.	Vascular access type for all pediatric (aged < 18 years) in-center hemodialysis patients on their last hemodialysis session during October-December 2005, by selected patient characteristics. 2006 ESRD CPM Project.	53
26.	Reasons for catheter placement in all pediatric (aged < 18 years) in-center hemodialysis patients using catheters on their last hemodialysis session during October-December 2005. 2006 ESRD CPM Project.	53
27.	Mean hemoglobin values (g/dL) and distribution of hemoglobin values for all pediatric (aged < 18 years) in-center hemodialysis patients, by patient characteristics, October-December 2005. 2006 ESRD CPM Project.	55
28.	Percent of all pediatric (aged < 18 years) in-center hemodialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP) in the US, and $\geq 3.5/3.2$ g/dL (BCG/BCP), by patient characteristics, October-December 2005. 2006 ESRD CPM Project.	57
29.	Description of peritoneal dialysis clearance for pediatric (aged < 18 years) peritoneal dialysis patients, by modality, October 2005 – March 2006. 2006 ESRD CPM Project.	58
30.	Distribution of Peritoneal Equilibration Test (PET) results for pediatric (aged < 18 years) peritoneal dialysis patients, October 2005-March 2006. 2006 ESRD CPM Project.	58
31.	Mean hemoglobin values (g/dL) and distribution of hemoglobin values for all pediatric (aged < 18 years) peritoneal dialysis patients, by patient characteristics, October 2005 – March 2006. 2006 ESRD CPM Project.	60
32.	Percent of all pediatric (aged < 18 years) peritoneal dialysis patients with mean serum albumin values $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP) in the U.S., by patient characteristics, October 2005 – March 2006. 2006 ESRD CPM Project.	61

Figure	Title	Page
1.	Geographical boundaries of the 18 ESRD Network Organizations (map).	1
2.	Vascular access type for all adult in-center hemodialysis patients on their last hemodialysis session during the study period. 2006 ESRD CPM Project.	17
3.	Percent of adult peritoneal dialysis patients with total solute clearance for urea and creatinine measured at least once during the study period (PD Adequacy CPM I) and with total solute clearance calculated in a standard way (PD Adequacy CPM II), October 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.	17
4.	Percent of adult peritoneal dialysis patients meeting 1997 NKF-DOQI guidelines for weekly Kt/V_{urea} and weekly creatinine clearance (PD Adequacy CPM III). 2006 ESRD CPM Project.	17
5.	Percent of adult in-center hemodialysis patients with mean delivered calculated, single session single pool (sp)Kt/V ≥ 1.2 in October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	17
6.	Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	18
7.	Distribution of mean hemoglobin values for adult in-center hemodialysis patients, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	18
8.	Percent of adult peritoneal dialysis patients with mean hemoglobin ≥ 11 g/dL, October 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.	18
9.	Distribution of mean hemoglobin values for adult peritoneal dialysis patients, October 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.	18
10.	Distribution of mean delivered calculated, single session spKt/V values for pediatric (aged < 18 years) in-center hemodialysis patients, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	19
11.	Vascular access type for pediatric (aged < 18 years) in-center hemodialysis patients on their last hemodialysis session during the study period. 2006 ESRD CPM Project.	19
12.	Distribution of mean hemoglobin values for pediatric (aged < 18 years) in-center hemodialysis patients, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	19
13.	Distribution of mean delivered calculated, single session spKt/V values for adult in-center hemodialysis patients, October-December 2005. 2006 ESRD CPM Project.	25
14.	Percent of adult in-center hemodialysis patients receiving dialysis with a mean delivered, single session spKt/V ≥ 1.2 , by Network, October-December 2005. 2006 ESRD CPM Project.	25
15.	Percent of adult in-center hemodialysis patients receiving dialysis with a mean delivered, single session spKt/V ≥ 1.2 , by Network, October-December 2005. 2006 ESRD CPM Project.	25
16.	Percent of adult male in-center hemodialysis patients with mean delivered, single session spKt/V ≥ 1.2 , by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	28

Figure	Title	Page
17.	Percent of adult female in-center hemodialysis patients with mean delivered, single session $\text{spKt/V} \geq 1.2$, by race, October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.	28
18.	Distribution of mean dialysis session length (minutes), October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.	28
19.	Percent of all adult in-center hemodialysis patients dialyzed with a catheter continuously for 90 days or longer as their vascular access on their last hemodialysis session during October–December 2005, by patient characteristics. 2006 ESRD CPM Project.	30
20.	Percent of all adult in-center hemodialysis patients dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October–December 2005, by patient characteristics. 2006 ESRD CPM Project.	30
21.	Percent of all adult in-center hemodialysis patients dialyzed with a catheter as their vascular access on their last hemodialysis session during October–December 2005, by patient characteristics. 2006 ESRD CPM Project.	31
22.	Percent of all adult in-center hemodialysis patients dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.	31
23.	Percent of incident adult in-center hemodialysis patients dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.	31
24.	Percent of all adult in-center hemodialysis patients dialyzed with a catheter as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.	31
25.	Percent of all adult in-center hemodialysis patients dialyzed with a catheter continuously for 90 days or longer as their vascular access on their last hemodialysis session during October–December 2005, by Network. 2006 ESRD CPM Project.	31
26.	Percent of incident adult in-center hemodialysis patients with different types of vascular access upon initiation of a maintenance course of hemodialysis and 90 days later. 2006 ESRD CPM Project.	34
27.	Percent of adult in-center hemodialysis patients (all and incident) dialyzed with a catheter as their access on their last hemodialysis session during October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.	35
28.	Percent of adult in-center hemodialysis patients (all and incident) dialyzed with an AV fistula as their vascular access on their last hemodialysis session during October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.	35
29.	Types of stenosis surveillance reported for adult in-center hemodialysis patients with either an AV fistula or an AV graft as their vascular access on their last hemodialysis session during October–December 2005 compared to previous study periods. 2006 ESRD CPM Project.	35
30.	Percent of incident adult in-center hemodialysis patients with different types of vascular access upon initiation of a maintenance course of hemodialysis and 90 days later, late 2005 compared to previous study periods. 2006 ESRD CPM Project.	35
31.	Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by Network, October–December 2005. 2006 ESRD CPM Project.	39
32.	Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by Network, October–December 2005. 2006 ESRD CPM Project.	39

Figure	Title	Page
33.	Percent of adult in-center hemodialysis patients with mean hemoglobin ≥ 11 g/dL, by selected patient characteristics and clinical parameters, October-December 2005. 2006 ESRD CPM Project.	39
34.	Percent of adult in-center hemodialysis patients with mean hemoglobin values ≥ 11 g/dL, by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	41
35.	Percent of adult in-center hemodialysis patients with specific anemia management indicators, October-December 2005 compared to selected previous study periods. 2006 ESRD CPM Project.	41
36.	Distribution of mean serum albumin for adult in-center hemodialysis patients, by laboratory method, October-December 2005. 2006 ESRD CPM Project.	42
37.	Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP), by race and gender, October-December 2005. 2006 ESRD CPM Project.	44
38.	Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP), by age, October-December 2005. 2006 ESRD CPM Project.	44
39.	Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)* by Network, October-December 2005. 2006 ESRD CPM Project.	44
40.	Percent of adult in-center hemodialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP), October-December 2005 compared to selected previous study periods. 2006 ESRD CPM Project.	44
41.	Percent of adult peritoneal dialysis patients meeting 1997 NKF-DOQI guidelines for weekly Kt/V_{urea} and weekly creatinine clearance (PD Adequacy CPM III). 2006 ESRD CPM Project.	46
42.	Distribution of mean hemoglobin values for adult peritoneal dialysis patients in the U.S., by race, October 2005-March 2006. 2006 ESRD CPM Project.	48
43.	Percent of adult peritoneal dialysis patients with mean hemoglobin ≥ 11 g/dL, by race, October 2005-March 2006 compared to selected previous study periods. 2006 ESRD CPM Project.	49
44.	Percent of adult peritoneal dialysis patients with specific anemia management indicators, October 2005-March 2006 compared to selected previous study periods. 2006 ESRD CPM Project.	49
45.	Percent of adult peritoneal dialysis patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP) and $\geq 3.5/3.2$ g/dL (BCG/BCP), October 2005-March 2006 compared to previous study periods. 2006 ESRD CPM Project.	50
46.	Distribution of mean delivered calculated, single session spKt/V values for all pediatric (aged <18 years) in-center hemodialysis patients, by age group, October-December 2005. 2006 ESRD CPM Project.	51
47.	Percent of all pediatric (aged < 18 years) male in-center hemodialysis patients with mean delivered calculated, single session spKt/V ≥ 1.2 , by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	52

Figure	Title	Page
48.	Percent of all pediatric (aged <18 years) female in-center hemodialysis patients with mean delivered calculated, single session spKt/V \geq 1.2, by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	52
49.	Vascular access type for pediatric (< 12 years) in-center hemodialysis patients on their last hemodialysis session during the study period, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	54
50.	Vascular access type for pediatric (aged 12 to < 18 years) in-center hemodialysis patients on their last hemodialysis session during the study period, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	54
51.	Distribution of mean hemoglobin values (g/dL) for all pediatric (aged < 18 years) in-center hemodialysis patients, by race, October-December 2005. 2006 ESRD CPM Project.	54
52.	Percent of all pediatric (aged < 18 years) in-center hemodialysis patients with mean hemoglobin \geq 11 g/dL, by selected patient characteristics and clinical parameters, October-December 2005. 2006 ESRD CPM Project.	54
53.	Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean hemoglobin \geq 11 g/dL, by gender, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	56
54.	Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean hemoglobin \geq 11 g/dL, by race, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	56
55.	Percent of pediatric (aged < 18 years) in-center hemodialysis patients with specific anemia management indicators, October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	56
56.	Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean serum albumin \geq 4.0/3.7 g/dL (BCG/BCP) and \geq 3.5/3.2 g/dL (BCG/BCP), by age, October-December 2005. 2006 ESRD CPM Project.	57
57.	Percent of pediatric (aged < 18 years) in-center hemodialysis patients with mean serum albumin \geq 4.0/3.7 g/dL (BCG/BCP) and \geq 3.5/3.2 g/dL (BCG/BCP), October-December 2005 compared to previous study periods. 2006 ESRD CPM Project.	57
58.	Distribution of mean hemoglobin values (g/dL) for all pediatric (aged < 18 years) peritoneal dialysis patients, by race, October 2005 – March 2006. 2006 ESRD CPM Project.	61
59.	Distribution of mean hemoglobin values (g/dL) for all pediatric (aged < 18 years) peritoneal dialysis patients, by ethnicity, October 2005 – March 2006. 2006 ESRD CPM Project.	61

XI. Appendices

Appendix 1. ESRD Clinical Performance Measures (CPMs) for 2006 Data Collection Effort Study period for HD patients is Oct, Nov, Dec 2005; for PD patients is Oct, Nov, Dec 2005 and Jan, Feb, Mar 2006

Hemodialysis (HD) Adequacy

1. HD Adequacy CPM I: Monthly Measurement of Delivered Hemodialysis Dose.

HD Adequacy Guideline 1: Regular Measurement of the Delivered Dose of Hemodialysis (Evidence).

The dialysis care team should routinely measure and monitor the delivered dose of hemodialysis.

HD Adequacy Guideline 6: Frequency of Measurement of Hemodialysis Adequacy (Opinion).

The delivered dose of hemodialysis should be measured at least once a month in all adult and pediatric hemodialysis patients. The frequency of measurement of the delivered dose of hemodialysis should be increased when:

1. Patients are noncompliant with their hemodialysis prescriptions (missed treatments, late for treatments, early sign-off from hemodialysis treatments, etc.).
2. Frequent problems are noted in delivery of the prescribed dose of hemodialysis (such as variably poor blood flows, or treatment interruptions because of hypotension or angina pectoris).
3. Wide variability in urea kinetic modeling results is observed in the absence of prescription changes.
4. The hemodialysis prescription is modified.

Numerator:

Number of patients in denominator with documented monthly adequacy measurements (URR or spKt/V) during the study period. (The study period for HD patients is Oct, Nov, Dec 2005).

Denominator:

All adult (≥ 18 years old) HD patients in the sample for analysis.

2. HD Adequacy CPM II: Method of Measurement of Delivered Hemodialysis Dose.

HD Adequacy Guideline 2: Method of Measurement of Delivered Dose of Hemodialysis (Evidence).

The delivered dose of hemodialysis in adult and pediatric patients should be measured using formal urea kinetic modeling (UKM), employing the single-pool, variable volume model.

Numerator:

Number of patients in denominator for whom delivered HD dose was calculated using formal urea kinetic modeling or Daugirdas II during the study period.

Denominator:

All adult (≥ 18 years old) HD patients in the sample for analysis.

3. HD Adequacy CPM III: Minimum Delivered Hemodialysis Dose.

HD Adequacy Guideline 4: Minimum Delivered Dose of Hemodialysis (Adults-Evidence, Children-Opinion). The dialysis care team should deliver a spKt/V of at least 1.2 (single-pool, variable volume) for both adult and pediatric hemodialysis patients. For those using the urea reduction ratio (URR), the delivered dose should be equivalent to a spKt/V of 1.2, i.e., an average URR of 65%; however URR can vary substantially as a function of fluid removal.

Numerator:

Number of patients in denominator whose average delivered dose of HD (calculated from data points on the data collection form) was a spKt/V ≥ 1.2 during the study period.

Denominator:

All adult (≥ 18 years old) HD patients in the sample for analysis who have been on HD for six months or more and dialyzing three times per week.

Peritoneal Dialysis (PD) Adequacy

4. PD Adequacy CPM I: Measurement of Total Solute Clearance at Regular Intervals.

PD Adequacy Guideline 4: Measures of Peritoneal Dialysis Dose and Total Solute Clearance (Opinion).

Both total weekly creatinine clearance normalized to 1.73 m² body surface area (BSA) and total weekly Kt/V_{urea} should be used to measure delivered peritoneal dialysis doses.

PD Adequacy Guideline 11: Dialysate and Urine Collections (Opinion).

Two to three total solute removal measurements are required during the first six months of peritoneal dialysis (See Guideline 3). After six months, if the dialysis prescription is unchanged:

1. Perform both complete dialysate and urine collections every four months; and
2. Perform urine collections every two months until the renal weekly Kt/V_{urea} is < 0.1.

Thereafter, urine collections are no longer necessary, as the residual renal function contribution to total Kt/V_{urea} becomes negligible (See Guideline 5).

Numerator:

Number of patients in denominator with total solute clearance for urea and creatinine measured at least once in a 6 month time period. (The study period for PD patients is Oct, Nov, Dec 2005 and Jan, Feb, Mar 2006).

Denominator:

All adult (≥ 18 years old) PD patients in sample for analysis, excluding tidal dialysis patients.

5. PD Adequacy CPM II: Calculate Weekly Kt/V_{urea} and Creatinine Clearance in a Standard Way.

PD Adequacy Guideline 4: Measures of Peritoneal Dialysis Dose and Total Solute Clearance (Opinion).

Both total weekly creatinine clearance normalized to 1.73 m² body surface area (BSA) and total weekly Kt/V_{urea} should be used to measure delivered peritoneal dialysis doses.

PD Adequacy Guideline 6: Assessing Residual Renal Function (Evidence).

Residual renal function (RRF), which can provide a significant component of total solute and water removal, should be assessed by measuring the renal component of Kt/V_{urea} and estimating the patient's glomerular filtration rate (GFR) by calculating the mean of urea and creatinine clearance.

PD Adequacy Guideline 9: Estimating Total Body Water and Body Surface Area (Opinion).

V (total body water) should be estimated by either the Watson or Hume method in adults using actual body weight.

Watson method:

For Men: V (liters) = 2.447 + 0.3362*Wt(kg) + 0.1074*Ht(cm) - 0.09516*Age(years)

For Women: V = -2.097 + 0.2466*Wt + 0.1069*Ht

Hume method:

For Men: V = -14.012934 + 0.296785*Wt + 0.192786*Ht

For Women: V = -35.270121 + 0.183809*Wt + 0.344547*Ht

BSA should be estimated by either the DuBois and DuBois method, the Gehan and George method, or the Haycock method using actual body weight.

For all formulae, Wt is in kg and Ht is in cm:

DuBois and DuBois method: BSA (m²) = 0.007184*Wt^{0.425}*Ht^{0.725}

Gehan and George method: BSA (m²) = 0.0235*Wt^{0.51456}*Ht^{0.42246}

Haycock method: BSA (m²) = 0.024265*Wt^{0.5378}*Ht^{0.3964}

Numerator:

The number of patients in denominator with all of the following:

- a. Weekly creatinine clearance normalized to 1.73 m² body surface area (BSA) and total weekly Kt/V_{urea} used to measure delivered PD dose; and
- b. Residual renal function (unless negligible*) is assessed by measuring the renal component of Kt/V_{urea} and estimating the patient's glomerular filtration rate (GFR) by calculating the mean of urea and creatinine clearance; and

c. Total body water (V) estimated by either the Watson or Hume method using actual body weight, and BSA estimated by either the DuBois and DuBois method, the Gehan and George method, or the Haycock method of using actual body weight, during the study period.

* negligible = < 200 mL urine in 24 hours.

Denominator:

All adult (≥ 18 years old) PD patients in the sample for analysis, excluding tidal dialysis patients.

6. PD Adequacy CPM III: Delivered Dose of Peritoneal Dialysis.

PD Adequacy Guideline 15: Weekly Dose of CAPD (Evidence).

For CAPD, the delivered peritoneal dialysis dose should be a total Kt/V_{urea} of at least 2.0 per week and a total creatinine clearance (CrCl) of at least 60 L/week/1.73 m².

PD Adequacy Guideline 16: Weekly Dose of NIPD and CCPD (Opinion).

For NIPD, the weekly delivered peritoneal dialysis dose should be a total Kt/V_{urea} of at least 2.2 and a weekly total CrCl of at least 66 L/1.73 m².

For CCPD, the weekly delivered peritoneal dialysis dose should be a total Kt/V_{urea} of at least 2.1 and a weekly total CrCl of at least 63 L/1.73 m².

Numerator:

a. For CAPD patients in the denominator, the delivered PD dose was a weekly Kt/V_{urea} of at least 2.0 and a weekly CrCl of at least 60 L/week/1.73 m² or evidence that the prescription was changed according to NKF-KDOQI recommendations, during the study period.

b. For cycler patients in the denominator without a daytime dwell (NIPD), the delivered PD dose was a weekly Kt/V_{urea} of at least 2.2 and a weekly CrCl of at least 66 L/week/1.73 m² or evidence that the prescription was changed according to NKF-KDOQI recommendations, during the study period. For cycler patients in the denominator with a daytime dwell (CCPD), the delivered PD dose was a weekly Kt/V_{urea} of at least 2.1 and a weekly CrCl of at least 63 L/week/1.73 m² or evidence that the prescription was changed according to NKF-KDOQI recommendations, during the study period.

Denominator:

All adult (≥ 18 years old) PD patients in the sample for analysis, excluding tidal dialysis patients.

Vascular Access

7. Vascular Access CPM I: Maximizing Placement of Arterial Venous Fistulae (AVF).

Vascular Access Guideline 29A: Goals of Access Placement-Maximizing Primary Arterial Venous Fistulae (Opinion). Primary arterial venous fistulae (AVF) should be constructed in at least 50% of all new patients electing to receive hemodialysis as their initial form of renal replacement therapy. Ultimately, 40% of prevalent patients should have a native AV fistula. (See Guideline 3, Selection of Permanent Vascular Access and Order of Preference of AV Fistulae).

Numerator:

a. The number of incident patients in the denominator who were dialyzed using an AVF during their last HD treatment during the study period. (The study period for HD patients is Oct, Nov, Dec 2005).

b. The number of prevalent patients in the denominator who were dialyzed using an AVF during their last HD treatment during the study period.

Denominator:

a. Incident adult (≥ 18 years old) HD patients (defined as those patients initiating their most recent course of HD on or between Jan 1 and Aug 31, 2005) in the sample for analysis.

b. Prevalent adult (≥ 18 years old) HD patients in the sample for analysis.

8. Vascular Access CPM II: Minimizing Use of Catheters as Chronic Dialysis Access.

Vascular Access Guideline 30A: Goals of Access Placement- Use of Catheters for Chronic Dialysis (Opinion). Less than 10% of chronic maintenance hemodialysis patients should be maintained on catheters as their permanent chronic dialysis access. In this context, chronic catheter access is defined as the use of a dialysis catheter for more than three months in the absence of a maturing permanent access.

Numerator:

The number of patients in the denominator who were dialyzed with a chronic catheter continuously for 90 days or longer prior to the last HD session during the study period.

Denominator:

All adult (≥ 18 years old) patients in the sample for analysis.

9. Vascular Access CPM III: Surveillance of Arterial Venous Grafts for Stenosis.

Vascular Access Guideline 10: Surveillance of Dialysis AV Grafts for Stenosis (Evidence/Opinion).

Physical examination of an access graft should be performed weekly and should include, but not be limited to, inspection and palpation for pulse and thrill at the arterial, mid, and venous sections of the graft (Opinion). Dialysis arterial venous graft accesses should be surveyed for hemodynamically significant stenosis. The DOQI Work Group recommends an organized surveillance approach with regular assessment of clinical parameters of the arterial venous access and dialysis adequacy. Data from the surveillance tests, clinical assessment, and dialysis adequacy measurements should be collected and maintained for each patient's access and made available to all staff. The data should be tabulated and tracked within each dialysis center as part of a Quality Assurance/ Continuous Quality Improvement (QA/CQI) program (Opinion). Prospective surveillance of arterial venous grafts for hemodynamically significant stenosis, when combined with correction, improves patency and decreases the incidence of thrombosis (Evidence). Techniques, not mutually exclusive, that can be used to survey for stenosis in arterial venous grafts include:

A. Intra-access flow (Evidence)

B. Static venous pressures (Evidence)

C. Dynamic venous pressures (Evidence)

Other studies or information that can be useful in detecting arterial venous graft stenosis include:

D. Measurement of access recirculation using urea concentrations (See Guideline 12) (Evidence)

E. Measurement of recirculation using dilution flow techniques (nonurea-based) (Evidence)

F. Unexplained decreases in the measured amount of hemodialysis delivered (URR, Kt/V) (Evidence)

G. Physical findings of persistent swelling of the arm, clotting of the graft, prolonged bleeding after needle withdrawal, or altered characteristics of pulse or thrill in a graft (Evidence/Opinion)

H. Elevated negative arterial pre-pump pressures that prevent increasing to acceptable blood flow (Evidence/Opinion)

I. Doppler ultrasound (Evidence/Opinion)

Persistent abnormalities in any of these parameters should prompt referral for venography (Evidence).

Numerator:

The number of patients in the denominator whose AV graft was routinely surveyed (screened) for the presence of stenosis during the study period by one of the following methods and with the stated frequency: Color-flow Doppler at least once every 3 months; Static venous pressure at least once every 2 weeks; Dynamic venous pressure every HD session; Dilution technique at least once every 3 months.

Denominator:

All adult (≥ 18 years old) patients in the sample for analysis who were on HD continuously during the study period and who were dialyzed through an arterial venous graft during their last HD session during the study period.

Anemia Management

10. Anemia Management CPM I: Target Hemoglobin for Epoetin Therapy.

Anemia Management Guideline 4: Target Hemoglobin (Hgb) for Epoetin Therapy (Evidence/Opinion).

The target range for hemoglobin should be 11-12 g/dL (110-120 g/L) (Evidence). This target is for epoetin therapy and is not an indication for blood transfusion therapy (Opinion).

Numerator:

Number of patients in denominator with documented mean Hgb of 11-12 g/dL (110-120 g/L) during the study period. (The study period for HD patients is Oct, Nov, Dec 2005 and Oct, Nov, Dec 2005 and Jan, Feb, Mar 2006 for PD patients).

Denominator:

All adult (≥ 18 years old) HD or PD patients in the sample for analysis, exclude patients with mean Hgb > 12 g/dL (120 g/L) who are not prescribed epoetin at any time during the study period.

11. Anemia Management CPM IIa: Assessment of Iron Stores among Anemic Patients or Patients Prescribed Epoetin.

Anemia Management Guideline 5: Assessment of Iron Status (Evidence).

Iron status should be monitored by the percent transferrin saturation and the serum ferritin concentration.

Anemia Management Guideline 6A: Target Iron Level (Evidence).

Chronic renal failure patients should have sufficient iron to achieve and maintain a Hgb of 11 to 12 g/dL (110-120 g/L).

Anemia Management Guideline 7A: Monitoring Iron Status (Opinion).

During the initiation of epoetin therapy and while increasing the epoetin dose in order to achieve an increase in hematocrit/hemoglobin, the transferrin saturation and the serum ferritin concentration should be checked every month in patients not receiving intravenous iron, and at least once every 3 months in patients receiving intravenous iron, until target hematocrit/hemoglobin is reached.

Anemia Management Guideline 7B: Monitoring Iron Status (Opinion).

Following attainment of the target hematocrit/hemoglobin, transferrin saturation and serum ferritin concentration should be determined at least once every 3 months.

Numerator:

a. The number of HD patients in the denominator with at least one documented transferrin saturation and serum ferritin concentration result every three months.

b. The number of PD patients in the denominator with at least two documented transferrin saturation and serum ferritin concentration results over the six-month study period.

[Note: Not directly comparable to Numerator "a", but most feasible given probable frequency of visits for PD patients.]

Denominator:

a. All adult (≥ 18 years old) HD patients included in the sample for analysis, if first monthly Hgb is < 11 g/dL (110 g/L) for at least one of the study months or if prescribed epoetin at any time during the study period regardless of Hgb.

b. All adult (≥ 18 years old) PD patients included in the sample for analysis, if first monthly Hgb is < 11 g/dL (110 g/L) for at least one of the two-month periods during the six-month study period or if prescribed epoetin at any time during the study period regardless of Hgb.

12. Anemia Management CPM IIb: Maintenance of Iron Stores-Target.

Anemia Management Guideline 6B: Target Iron Level (Evidence).

To achieve and maintain target Hgb of 11-12 g/dL (110-120 g/L), sufficient iron should be administered to maintain a transferrin saturation of $\geq 20\%$, and a serum ferritin concentration of ≥ 100 ng/mL.

Numerator:

a. The number of HD patients in the denominator with at least one documented transferrin saturation $\geq 20\%$ and at least one documented serum ferritin concentration ≥ 100 ng/mL during a three-month period.

b. The number of PD patients in the denominator with at least one documented transferrin saturation $\geq 20\%$ and at least one documented serum ferritin concentration ≥ 100 ng/mL during the six-month study period.

[Note: Not directly comparable to Numerator "a", but most feasible given probable frequency of visits for PD patients.]

Denominator:

a. All adult (≥ 18 years old) HD patients included in sample, if first monthly Hgb is < 11 g/dL (110 g/L) for at least one of the study months or if prescribed epoetin at any time during the study period regardless of Hgb.

b. All adult (≥ 18 years old) PD patients included in sample, if first monthly Hgb is < 11 g/dL (110 g/L) for at least one of the two-month periods during the six-month study period or if prescribed epoetin at any time during the study period regardless of Hgb.

13. Anemia Management CPM III: Administration of Supplemental Iron.

Anemia Management Guideline 8A: Administration of Supplemental Iron (Evidence).

Supplemental iron should be administered to prevent iron deficiency and to maintain adequate iron stores so that chronic renal failure patients can achieve and maintain a Hgb of 11 to 12 g/dL (110-120 g/L) in conjunction with epoetin therapy.

Anemia Management Guideline 8C: Administration of Supplemental Iron (Evidence/Opinion).

The adult pre-dialysis, home hemodialysis, and peritoneal dialysis patient may not be able to maintain adequate iron status with oral iron. Therefore, 500 to 1000 mg of iron dextran may be administered intravenously in a single infusion, and repeated as needed, after an initial one-time test dose of 25 mg.

Anemia Management Guideline 8D: Administration of Supplemental Iron (Opinion/Evidence).

A trial of oral iron is acceptable in the hemodialysis patient, but is unlikely to maintain the transferrin saturation > 20%, serum ferritin concentration > 100 ng/mL, and Hgb at 11-12 g/dL (110-120 g/L).

Anemia Management Guideline 8G: Administration of Supplemental Iron (Opinion/Evidence).

Most patients will achieve a Hgb 11 to 12 g/dL (110-120 g/L) with transferrin saturation and serum ferritin concentration < 50% and < 800 ng/mL, respectively. In patients in whom transferrin saturation is \geq 50% and/or serum ferritin concentration is \geq 800 ng/mL, intravenous iron should be withheld for up to three months, at which time the iron parameters should be re-measured before intravenous iron is resumed. When the transferrin saturation and serum ferritin concentration have fallen to < 50% and < 800 ng/mL, respectively, intravenous iron can be resumed at a dose reduced by one-third to one-half.

Anemia Management Guideline 8H: Administration of Supplemental Iron (Opinion).

It is anticipated that once optimal hematocrit/hemoglobin and iron stores are achieved, the required maintenance dose of intravenous iron may vary from 25 to 100 mg/week for hemodialysis patients. The goal is to provide a weekly dose of intravenous iron in hemodialysis patients that will allow the patient to maintain the target hematocrit/hemoglobin at a safe and stable iron level. The maintenance iron status should be monitored by measuring the transferrin saturation and serum ferritin concentration every three months.

Numerator:

- a. The number of HD patients in the denominator prescribed intravenous iron in at least one of the study months.
- b. The number of PD patients in denominator prescribed intravenous iron in at least one of the two-month periods during the six-month study period

Denominator:

- a. All adult (\geq 18 years old) HD patients included in the sample for analysis if first monthly Hgb < 11 g/dL (110 g/L) for at least one month out of a three-month period or prescribed epoetin at any time during the study period regardless of Hgb level, with at least one transferrin saturation < 20% or at least one serum ferritin concentration < 100 ng/mL. EXCLUDE patients with mean transferrin saturation \geq 50% or mean serum ferritin concentration \geq 800 ng/mL and EXCLUDE patients in first three months of dialysis and prescribed oral iron.
- b. All adult (\geq 18 years old) PD patients included in the sample for analysis if the first Hgb in a two-month period < 11 g/dL (110 g/L) for at least one of the two-month periods during the six-month study period or prescribed epoetin at any time during the study period regardless of Hgb level, with at least one transferrin saturation < 20% or at least one serum ferritin concentration < 100 ng/mL. EXCLUDE patients with mean transferrin saturation \geq 50% or mean serum ferritin concentration \geq 800 ng/mL and EXCLUDE patients in first three months of dialysis and prescribed oral iron.

Appendix 2

IN-CENTER HEMODIALYSIS (HD) CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006

[Before completing please read instructions at the bottom of this page and on pages 5 and 6]

PATIENT IDENTIFICATION	MAKE CORRECTIONS TO PATIENT INFORMATION ON LABEL IN THE SPACE BELOW
<div style="background-color: #cccccc; width: 80%; margin: 0 auto; padding: 10px; border: 1px solid #ccc;"> Place Patient Data Label Here </div>	
12. If this patient is unknown or was not dialyzed in the facility at any time during OCT 2005-DEC 2005 return the blank form to the Network.	
13. Patient's Ethnicity (Check appropriate box). <input type="checkbox"/> Not Hispanic or Latino <input type="checkbox"/> Hispanic or Latino: Please specify country/area of origin or ancestry _____	
14. Patient's height (MUST COMPLETE): _____ inches OR _____ centimeters (only for patients < 18 years old, provide date when height was measured: ____/____/____) (mm) (dd) (yyyy)	
Individual Completing Form (Please print): First name: _____ Last name: _____ Title: _____ Phone number: (____) _____ - _____ Fax number: (____) _____ - _____	

INSTRUCTIONS FOR COMPLETING THE IN-CENTER HEMODIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006

The label on the top left side of this form contains the following patient identifying information (#'s 1-11). If the information is incorrect make corrections to the right of the label.

- | | |
|---|--|
| 1. LAST and first name
3. SOCIAL Security Number (SSN)
5. GENDER (1=Male; 2=Female)
7. PRIMARY cause of renal failure by CMS-2728 code
9. ESRD Network number - Do not make corrections to this item. | 2. DATE of birth (DOB) as MM/DD/YYYY
4. HEALTH Insurance Claim Number (HIC), (same as Medicare number)
6. RACE, check all that apply (1=American Indian/Alaska Native; 2=Asian; 3=Black or African American; 4=White; 6=Native Hawaiian or Other Pacific Islander)
8. DATE, as MM/DD/YYYY, that the patient FIRST began a regular course of dialysis
10. Facility's Medicare provider number
11. The most RECENT date this patient returned to hemodialysis following: transplant failure, an episode of regained kidney function, or switched modality. |
|---|--|
12. If the patient is unknown or if the patient was not dialyzed in the facility at any time during OCT 2005 through DEC 2005, send the blank form back to the ESRD Network office. Provide the name and address of the facility providing services to this patient on December 31, 2005, if known.
13. Patient's Ethnicity. Please verify the patient's ethnicity with the patient and check appropriate box. If "Hispanic or Latino" is checked, please specify country/area of origin or ancestry.
14. Enter the patient's height in inches or centimeters. HEIGHT MUST BE ENTERED, do not leave this field blank. You may ask the patient his/her height to obtain this information. If the patient had both legs amputated, record pre-amputation height.

PLEASE COMPLETE ITEMS 15 AND 16 ON PAGE 2, ITEM 17 ON PAGE 3, AND ITEMS 18 AND 19 ON PAGE 4 OF THIS DATA COLLECTION FORM.
 INSTRUCTIONS FOR COMPLETING THESE ITEMS ARE ON PAGES 5 AND 6.

IN-CENTER HEMODIALYSIS (HD) CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)			
15. ANEMIA MANAGEMENT: For each lab question below, enter the 1st pre-dialysis lab value obtained for each month: OCT, NOV, DEC 2005. Include the date each lab was drawn. Enter NF/NP if the lab value cannot be located.			
	OCT 2005	NOV 2005	DEC 2005
A. First pre-dialysis laboratory hemoglobin (Hgb) of the month:	_____. ____ g/dL Date: ____/____/____ (If NF/NP go to 15C)	_____. ____ g/dL Date: ____/____/____ (If NF/NP go to 15C)	_____. ____ g/dL Date: ____/____/____ (If NF/NP go to 15C)
B.1.a. Did the patient have Epoetin prescribed at any time during the 28 days before the Hgb in 15A was drawn?	Epoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Epoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Epoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
B.1.b. Did the patient have Darbepoetin (Aranesp™) prescribed at any time during the 28 days before the Hgb in 15A was drawn?	Darbepoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Darbepoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Darbepoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
C. First pre-dialysis serum ferritin concentration of the month:	_____ ng/mL Date: ____/____/____	_____ ng/mL Date: ____/____/____	_____ ng/mL Date: ____/____/____
D. First pre-dialysis % transferrin saturation (TSAT) of the month:	_____ % Date: ____/____/____	_____ % Date: ____/____/____	_____ % Date: ____/____/____
E. Was iron prescribed at any time during the month?	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 16) <input type="checkbox"/> Unknown (go to 16)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 16) <input type="checkbox"/> Unknown (go to 16)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 16) <input type="checkbox"/> Unknown (go to 16)
F. If yes, what was the prescribed route of iron administration? (Check all that apply).	<input type="checkbox"/> IV <input type="checkbox"/> PO <input type="checkbox"/> Unknown	<input type="checkbox"/> IV <input type="checkbox"/> PO <input type="checkbox"/> Unknown	<input type="checkbox"/> IV <input type="checkbox"/> PO <input type="checkbox"/> Unknown
16. MINERAL METABOLISM MANAGEMENT: Enter the 1st pre-dialysis serum calcium, phosphorus, and albumin obtained for each month: OCT, NOV, DEC 2005. Include the date each lab was drawn. Enter NF/NP if the lab value cannot be located. Check the method used (16D) (BCG [bromcresol green] or BCP [bromcresol purple]) by the lab to determine serum albumin. If the lab method is unknown, please call lab to find out.			
	OCT 2005	NOV 2005	DEC 2005
A. First pre-dialysis serum calcium of the month. Drawn on the same date as 16C:	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____
B. First pre-dialysis serum phosphorus of the month. Drawn on the same date as 16C:	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____
C. First pre-dialysis serum albumin of the month.	_____ gm/dL Date: ____/____/____	_____ gm/dL Date: ____/____/____	_____ gm/dL Date: ____/____/____
D. Check lab method used: BCG = bromcresol green; BCP = bromcresol purple	<input type="checkbox"/> BCG <input type="checkbox"/> BCP	<input type="checkbox"/> BCG <input type="checkbox"/> BCP	<input type="checkbox"/> BCG <input type="checkbox"/> BCP

IN-CENTER HEMODIALYSIS (HD) CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)			
17. ADEQUACY: Enter the information requested below for the dialysis session when the 1st labs of the month were drawn and used to measure adequacy for each month: OCT, NOV, DEC 2005. Include the date the labs were drawn. Enter NF/NP if the information cannot be located.			
	OCT 2005	NOV 2005	DEC 2005
A. How many times per week was this patient prescribed to receive dialysis during the week prior to when the pre and post BUNs were drawn?	_____ times per week	_____ times per week	_____ times per week
B. First pre-dialysis BUN value of the month:	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____
C. First post-dialysis BUN value of the month: (both the pre & post dialysis BUN must be drawn on the same day)	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____	_____ mg/dL Date: ____/____/____
D. Pre- & Post-dialysis weight at session when BUNs above drawn: (Circle either lbs or kgs)	Pre: _____ lbs/kgs Post: _____ lbs/kgs	Pre: _____ lbs/kgs Post: _____ lbs/kgs	Pre: _____ lbs/kgs Post: _____ lbs/kgs
E. Actual DELIVERED time on dialysis at session when BUNs above drawn:	_____ hrs _____ min	_____ hrs _____ min	_____ hrs _____ min
F. First recorded URR of the month:	_____ % Date: ____/____/____	_____ % Date: ____/____/____	_____ % Date: ____/____/____
G. First recorded single-pool Kt/V of the month:	_____._____ Date: ____/____/____	_____._____ Date: ____/____/____	_____._____ Date: ____/____/____
H. Method used to calculate the single-pool Kt/V in 17G: (If unknown, please ask Medical Director)	<input type="checkbox"/> Urea Kinetic Modeling <input type="checkbox"/> Daugirdas II <input type="checkbox"/> Depner <input type="checkbox"/> Derived from URR based on no pt. wts. <input type="checkbox"/> Other _____	<input type="checkbox"/> Urea Kinetic Modeling <input type="checkbox"/> Daugirdas II <input type="checkbox"/> Depner <input type="checkbox"/> Derived from URR based on no pt. wts. <input type="checkbox"/> Other _____	<input type="checkbox"/> Urea Kinetic Modeling <input type="checkbox"/> Daugirdas II <input type="checkbox"/> Depner <input type="checkbox"/> Derived from URR based on no pt. wts. <input type="checkbox"/> Other _____

IN-CENTER HEMODIALYSIS (HD) CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)	
<p>18. VASCULAR ACCESS: What type of access was used on the last hemodialysis session on or between 10/1/2005 and 12/31/2005 at the patient's primary in-center facility? Check only one of the following access types and follow the corresponding directions.</p>	
<p><input type="checkbox"/> AV Fistula <input type="checkbox"/> Graft with AV Fistula <input type="checkbox"/> Graft without AV Fistula</p> <p>If you checked AV Fistula or Graft (with or without AV Fistula) please answer questions 1, 2, and 3 at the right.</p>	<p>If patient had AV Fistula or Graft:</p> <p>1. Was surveillance for the presence of stenosis performed between 10/1/05 and 12/31/05? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown</p> <p>2. If answer to question 1 is "Yes," please check all methods of surveillance (below) that were utilized. (See instructions on page 6). <input type="checkbox"/> Color-Flow Doppler at least once between 10/1/05 and 12/31/05 <input type="checkbox"/> Static Venous Pressure at least once every 2 weeks between 10/1/05 and 12/31/05 <input type="checkbox"/> Dynamic Venous Pressure every HD session between 10/1/05 and 12/31/05 <input type="checkbox"/> Dilution Technique at least once between 10/1/05 and 12/31/05 <input type="checkbox"/> On-Line Clearance (OLC) Based Access Flow at least once between 10/1/05 and 12/31/05 <input type="checkbox"/> Other _____</p> <p>3. Did the patient have an active AV Fistula or Graft (being used for hemodialysis) AND an inactive catheter or port access (not being used for hemodialysis) during the last hemodialysis session on or between 10/1/2005 and 12/31/2005? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><input type="checkbox"/> Catheter <input type="checkbox"/> Port Access</p> <p>If you checked Catheter or Port Access, please answer questions 1 and 2 at the right.(check all that apply to reasons for catheter or port access at this time)</p>	<p>If patient had a catheter or port access: (check all boxes by the reasons that apply)</p> <p>1. Reason for catheter or port access: <input type="checkbox"/> Fistula maturing, not ready to cannulate (with two needles) <input type="checkbox"/> No fistula or graft surgically planned (check all subcategories that apply) <input type="checkbox"/> Graft maturing, not ready to cannulate (with two needles) <input type="checkbox"/> Peripheral vascular disease <input type="checkbox"/> Temporary interruption of fistula due to clotting or revisions <input type="checkbox"/> Patient size too small for AV fistula or graft <input type="checkbox"/> Temporary interruption of graft due to clotting or revisions <input type="checkbox"/> Renal transplantation scheduled <input type="checkbox"/> No fistula or graft surgically created at this time <input type="checkbox"/> Physician/Surgeon preference <input type="checkbox"/> Useable fistula or graft sites have been exhausted (check all subcategories that apply) <input type="checkbox"/> At least one failed fistula exists <input type="checkbox"/> A failed graft exists <input type="checkbox"/> Fistula history uncertain <input type="checkbox"/> Other _____</p> <p>2. Had a catheter or port access been used exclusively for the past 90 days or longer? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown</p>
<p><input type="checkbox"/> Unknown</p>	
<p>19. Did the patient FIRST start hemodialysis during January 1, 2005-August 31, 2005 (see date #8 on page 1)? DO NOT include patients who transferred from peritoneal dialysis, had a newly failed transplant, or returned after an episode of regained kidney function (See instructions on page 6). <input type="checkbox"/> Yes (answer 19A-B) <input type="checkbox"/> No</p>	
<p>A. What type of access was in use at the Initiation of a maintenance course of hemodialysis (First hemodialysis was during JAN 1, 2005 - AUG 31, 2005.)? <input type="checkbox"/> AV Fistula <input type="checkbox"/> Graft <input type="checkbox"/> Catheter <input type="checkbox"/> Port Access <input type="checkbox"/> Unknown</p>	
<p>B. What type of access was in use 90 days later? <input type="checkbox"/> AV Fistula <input type="checkbox"/> Graft <input type="checkbox"/> Catheter <input type="checkbox"/> Port Access <input type="checkbox"/> Unknown</p>	

IN-CENTER HEMODIALYSIS (HD) CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)
INSTRUCTIONS FOR COMPLETING QUESTIONS 15 THROUGH 19 (Continued from page 1): To answer questions 15 through 19, review the patient's clinic or facility medical record for OCT 1, 2005 through DEC 31, 2005. Do not leave any items blank. Enter NF/NP if the information cannot be located.
15A: Enter the patient's first pre-dialysis hemoglobin (Hgb) for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If not found or not performed during the month, enter NF/NP.
15B.1: Check the appropriate box to indicate if the patient had EPOETIN prescribed at any time during the 28 days BEFORE the date of the hemoglobin in 15A or had DARBEPOETIN (Aranesp™) prescribed at any time during the 28 days BEFORE the date of the hemoglobin value in 15A.
15C: Enter the patient's first pre-dialysis serum ferritin concentration for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If a serum ferritin concentration test was not found or not performed during the month, enter NF/NP.
15D: Enter the patient's first pre-dialysis % transferrin saturation (TSAT) for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If a % transferrin saturation (TSAT) test was not found or not performed during the month, enter NF/NP.
15E: Check either "Yes", "No", or "Unknown" to indicate if iron was prescribed at any time during the months of OCT, NOV, and DEC 2005. If there was no prescription for iron go to question 16.
15F: If the answer to 15E is "Yes", please check the appropriate box to indicate the route of iron administration (intravenous[IV] or by mouth [PO]) for OCT, NOV, and DEC 2005. If the patient received iron by mouth and IV during the month please check both boxes.
16A: Enter the patient's first pre-dialysis serum calcium for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If a serum calcium was not found or not performed during the month, enter NF/NP.
16B: Enter the patient's first pre-dialysis serum phosphorus for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If a serum phosphorus was not found or not performed during the month, enter NF/NP.
16C: Enter the patient's first pre-dialysis serum albumin for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If a serum albumin was not found or not performed during the month, enter NF/NP.
16D: Check the method used by the laboratory to determine the serum albumin value (bromocresol green or bromocresol purple). If you do not know what method the laboratory used, call the lab to find out this information.
17A: Enter the number of times per week the patient was prescribed to receive dialysis in OCT, NOV, and DEC 2005. If the prescription varied during a month, enter the prescription in effect the week prior to when the pre- and post-BUNs were drawn. Do not leave this question blank.
17B & C: Enter the patient's first pre- and post-dialysis BUNs for each month. Include the dates the labs were drawn. Both the pre- and post-dialysis BUN must be drawn on the same day. Enter NF/NP if not found or not performed during the month.
17D: Enter the patient's pre- and post-dialysis weight at the dialysis session when the pre- and post-dialysis BUNs in questions 17B&C were drawn. Circle either lbs or kgs as appropriate.
17E: Enter the patient's total treatment time (actual delivered time) on dialysis during the session when the BUNs in questions 17B&C were drawn for months OCT, NOV, DEC 2005. Do not enter the prescribed time on dialysis.
17F: Enter the patient's first URR recorded on the lab sheet for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If not found or not performed during a month, enter NF/NP.
17G: Enter the patient's first single-pool Kt/V recorded on the lab sheet for each month OCT, NOV, DEC 2005. Include the date the lab was drawn. If not found or not performed during a month, enter NF/NP.
17H: Check the box to indicate the method used to calculate the single-pool Kt/V in 17G. If you do not know what method was used, please ask the unit's Medical Director. Please check the "Other" box if you do not use any of the methods listed. If using another method and you know what it is, please write the method in the space provided.

IN-CENTER HEMODIALYSIS (HD) CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)	
18:	Check only one type of vascular access used on last hemodialysis session on or between OCT 1, 2005 and DEC 31, 2005 at the patient's primary in-center facility and then complete the corresponding questions to the right of the access type. Exclude dialysis sessions performed at temporary facilities because of holiday travel or hospitalizations. If a fistula and catheter are being used simultaneously for vascular access, the patient's access type should be considered catheter. ("Port Access" is considered a vascular access device which consists of a valve and cannula that is subcutaneously implanted and is accessed by dialysis needles).
AV Fistula or Graft:	
If the vascular access marked for question 18 was an AV fistula or graft (with or without AV fistula) indicate if routine surveillance for the presence of stenosis between Oct 1, 2005 and Dec 31, 2005 was done. Routine surveillance is the sequential measurement of access flow OR of venous pressure.	
<ul style="list-style-type: none"> • Indicate "YES" for this question if you measure access flow OR venous pressure using any of the following: <ul style="list-style-type: none"> Techniques and frequencies used to measure access flow include: <ul style="list-style-type: none"> a. one of the dilution methods in which the needles are reversed and recirculation is deliberately induced on a regular basis, OR b. conventional Color-Flow Doppler at a minimum of once every three months. Techniques and frequencies used to measure venous pressure include: <ul style="list-style-type: none"> a. dynamic venous pressure measured at every hemodialysis session; uses low blood pump flow rates usually set at 200mL/min., OR b. static venous pressure measured at a minimum of once every two weeks; performed at zero blood pump flow. • Indicate "NO" for this question if you only conduct (or note) the following clinical assessments: <ul style="list-style-type: none"> a. Prolonged bleeding after needle withdrawal. b. Altered characteristics of thrill or bruit. c. Adequacy measurements using Kt/V or URR. d. Recirculation methods. 	
Continue with question 2 if answered "yes" above and check all surveillance methods utilized based on the definitions and intervals given above. If other techniques and/or corresponding intervals were used check "other" and write in the technique and corresponding intervals.	
Continue with question 3 and answer "yes" if patient had a catheter or port access that was being used previously for hemodialysis but had not been removed on last hemodialysis session on or between 10/1/2005 and 12/31/2005.	
Catheter or Port Access:	
If the vascular access marked for question 18 was a catheter or port access, indicate in the appropriate space the reason for the catheter or port access .	
Continue with question 2 and indicate in the appropriate space if one or more catheters or port accesses had been used continuously in this patient for the past 90 days or longer between OCT 1, 2005 and DEC 31, 2005.	
Unknown:	
If the vascular access in question 18 is unknown indicate by checking the "unknown" box and then continue to question 19.	
19:	Check the appropriate space to indicate if the patient FIRST started hemodialysis during January 1, 2005-August 31, 2005 (see date #8 on page 1). These patients would have begun a regular maintenance course of hemodialysis during January 1, 2005 - August 31, 2005. DO NOT include patients who have transferred from peritoneal dialysis, had a newly failed transplant, or returned after an episode of regained kidney function, and were placed on maintenance hemodialysis during the time frame January 1, 2005-August 31, 2005. If "Yes", answer questions 19A-B. If "No", questions 19A-B should be left blank and the form has been completed.
19A:	Check the appropriate space to indicate type of vascular access in use upon Initiation of a maintenance course of hemodialysis. Patient's FIRST hemodialysis would be during the time frame January 1, 2005-August 31, 2005. Exclude patients who have received intermittent dialysis treatments for volume overload or congestive heart failure. ("Port Access" is considered a vascular access device which consists of a valve and cannula that is subcutaneously implanted and is accessed by dialysis needles)
19B:	Check the appropriate space to indicate type of vascular access, for the patient identified in 19A, in use 90 days after the patient first started hemodialysis. ("Port Access" is considered a vascular access device which consists of a valve and cannula that is subcutaneously implanted and is accessed by dialysis needles).

Appendix 3

**PERITONEAL DIALYSIS CLINICAL PERFORMANCE
MEASURES DATA COLLECTION FORM 2006**

[Before completing please read instructions at the bottom of this page and on pages 5 and 6]

PATIENT IDENTIFICATION	MAKE CORRECTIONS TO PATIENT INFORMATION ON LABEL IN THE SPACE BELOW
<div style="background-color: #cccccc; width: 80%; margin: 0 auto; padding: 10px;"> Place Patient Data Label Here </div>	
12. If this patient is unknown or was not dialyzed in the facility at any time during OCT 2005-MAR 2006 return the blank form to the Network.	
13. Patient's Ethnicity (Check appropriate box). <input type="checkbox"/> Not Hispanic or Latino <input type="checkbox"/> Hispanic or Latino: Please specify country/area of origin or ancestry _____	
14a. Patient's height (MUST COMPLETE): _____ inches OR _____ centimeters (only for patients < 18 years old, provide date when height was measured: ____ / ____ / ____) (mm) (dd) (yyyy)	
14b. Patient's weight (abdomen empty) (first clinic visit weight after Sept. 30, 2005): _____ lbs. OR _____ kg.	
Individual Completing Form (Please print): First name: _____ Last name: _____ Title: _____ Phone number: (____) _____ - _____ Fax number: (____) _____ - _____	

INSTRUCTIONS FOR COMPLETING THE PERITONEAL DIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006

The label on the top left side of this form contains the following patient identifying information (#'s 1-11). If the information is incorrect make corrections to the right of the label.

- | | |
|---|--|
| 1. LAST and first name
3. SOCIAL Security Number (SSN)
5. GENDER (1=Male; 2=Female)
7. PRIMARY cause of renal failure by CMS-2728 code
9. ESRD Network number - Do not make corrections to this item. | 2. DATE of birth (DOB) as MM/DD/YYYY
4. HEALTH Insurance Claim Number (HIC), (same as Medicare number)
6. RACE, check all that apply (1=American Indian/Alaska Native; 2=Asian; 3=Black or African American; 4=White; 6=Native Hawaiian or Other Pacific Islander)
8. DATE, as MM/DD/YYYY, that the patient FIRST began a regular course of dialysis
10. Facility's Medicare provider number
11. The most RECENT date this patient returned to peritoneal dialysis following: transplant failure, an episode of regained kidney function, or switched modality |
|---|--|

12. If the patient is unknown or if the patient was not dialyzed in the facility at any time during OCT 2005 through MAR 2006, send the blank form back to the ESRD Network office. Provide the name and address of the facility providing services to this patient on December 31, 2005, if known.
13. Patient's Ethnicity. Please verify the patient's ethnicity with the patient and check appropriate box. If "Hispanic or Latino" is checked, please specify country/area of origin or ancestry.
- 14a. Enter the patient's height in inches or centimeters. HEIGHT MUST BE ENTERED, do not leave this field blank. You may ask the patient his/her height to obtain this information. If the patient had both legs amputated, record pre-amputation height.
- 14b. Enter the patient's weight (abdomen empty) in pounds or kilograms. Use the FIRST CLINIC VISIT weight on or after September 30, 2005. If abdomen is not empty for weight, subtract the weight of the fill fluid from the measured patient weight.

PLEASE COMPLETE ITEMS 15 AND 16 ON PAGE 2, ITEMS 17 AND 18 ON PAGE 3, AND ITEMS 19 AND 20 ON PAGE 4.
INSTRUCTIONS FOR COMPLETING THESE ITEMS ARE ON PAGES 5 AND 6.

PERITONEAL DIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)			
15. ANEMIA MANAGEMENT: For each lab question below, enter the first lab value obtained for each two month time period: OCT-NOV 2005, DEC 2005-JAN 2006, FEB-MAR 2006. Include the date each lab was drawn. Enter NF/NP if the lab value cannot be located.			
	OCT-NOV 2005	DEC 2005-JAN 2006	FEB-MAR 2006
A. First laboratory hemoglobin (Hgb) during the two month time period.	_____._____._____/g/dL Date: ____/____/____ (If NF/NP go to 15C)	_____._____._____/g/dL Date: ____/____/____ (If NF/NP go to 15C)	_____._____._____/g/dL Date: ____/____/____ (If NF/NP go to 15C)
B.1.a. Did the patient have a prescription for Epoetin at any time during the 28 days before the Hgb in 15A was drawn?	Epoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Epoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Epoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
B.1.b. Did the patient have a prescription for Darbepoetin(Aranesp™) at any time during the 28 days before the Hgb in 15A was drawn?	Darbepoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Darbepoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Darbepoetin <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
C. First serum ferritin concentration during the two month time period:	_____._____._____/ng/mL Date: ____/____/____	_____._____._____/ng/mL Date: ____/____/____	_____._____._____/ng/mL Date: ____/____/____
D. First % transferrin saturation (TSAT) during the two month time period:	_____._____._____/% Date: ____/____/____	_____._____._____/% Date: ____/____/____	_____._____._____/% Date: ____/____/____
E. Was iron prescribed at any time during the two month time period?	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 16) <input type="checkbox"/> Unknown (go to 16)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 16) <input type="checkbox"/> Unknown (go to 16)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 16) <input type="checkbox"/> Unknown (go to 16)
F. If yes, what was the prescribed route of iron administration? (Check all that apply).	<input type="checkbox"/> IV <input type="checkbox"/> PO <input type="checkbox"/> Unknown	<input type="checkbox"/> IV <input type="checkbox"/> PO <input type="checkbox"/> Unknown	<input type="checkbox"/> IV <input type="checkbox"/> PO <input type="checkbox"/> Unknown
16. MINERAL METABOLISM MANAGEMENT: Enter the first serum calcium, phosphorus, and albumin obtained for each two month period: OCT-NOV 2005, DEC 2005-JAN 2006, FEB-MAR 2006. Include the date each lab was drawn. Enter NF/NP if the lab value cannot be located. Check the method used (16D) (BCG [bromcresol green] or BCP [bromcresol purple]) by the lab to determine serum albumin. If the lab method is unknown, please call lab to find out.			
	OCT-NOV 2005	DEC 2005-JAN 2006	FEB-MAR 2006
A. First serum calcium during the two month time period. Drawn on the same date as 16C:	_____._____._____/mg/dL Date: ____/____/____	_____._____._____/mg/dL Date: ____/____/____	_____._____._____/mg/dL Date: ____/____/____
B. First serum phosphorus during the two month time period. Drawn on the same date as 16C:	_____._____._____/mg/dL Date: ____/____/____	_____._____._____/mg/dL Date: ____/____/____	_____._____._____/mg/dL Date: ____/____/____
C. First serum albumin during the two month time period.	_____._____._____/gm/dL Date: ____/____/____	_____._____._____/gm/dL Date: ____/____/____	_____._____._____/gm/dL Date: ____/____/____
D. Check lab method used: BCG = bromcresol green; BCP = bromcresol purple	<input type="checkbox"/> BCG <input type="checkbox"/> BCP	<input type="checkbox"/> BCG <input type="checkbox"/> BCP	<input type="checkbox"/> BCG <input type="checkbox"/> BCP

PERITONEAL DIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)	
17. PD ADEQUACY: The following data are requested for the FIRST PD ADEQUACY determination during the months OCT 2005 through MAR 2006. Starting with the first adequacy measurement in these months, enter the adequacy measurements/results listed below that were obtained. (Please DO NOT record more than one adequacy measurement done for any one month.) Please read instructions on Page 5 & 6 before completing this section. Enter NF/NP if information cannot be located.	
17. Was PD adequacy measurement done between 10-1-2005 and 3-31-2006?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
17A. Date of FIRST PD adequacy measurement between 10-1-2005 and 3-31-2006	___ / ___ / ___) (mm) (dd) (yyyy)
17B. Patient's dialysis modality when adequacy measures were performed	<input type="checkbox"/> CAPD <input type="checkbox"/> Cyclor (See definitions in instructions on page 5)
17B.1 If Cyclor, does the prescription include TIDAL dialysis?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
17C. Patient's weight at the time of this adequacy assessment (abdomen empty) (Circle lbs or kgs)	_____ . ___ lbs /kgs
17D. Weekly Kt/Vurea (dialysate and urine clearance)	_____ . _____
17E. Method by which V above was calculated: Check one. (If unknown please call lab.)	<input type="checkbox"/> %BW <input type="checkbox"/> Hume <input type="checkbox"/> Watson <input type="checkbox"/> Other _____
17F. Is Creatinine Clearance corrected for body surface area, using standard methods? (See instructions on page 6)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
17G. Weekly Creatinine Clearance (dialysate and urine clearance)	_____ . ___ L/wk or _____ . ___ L/wk/1.73m ²
17H. 24 hr DIALYSATE volume (prescribed and ultrafiltration)	_____ mL
17I. 24 hr DIALYSATE urea nitrogen:	_____ . ___ mg/dL
17J. 24 hr DIALYSATE creatinine:	_____ . ___ mg/dL
17K. 24 hr URINE volume: (If 24 hr urine was not located check NF/NP.)	_____ mL <input type="checkbox"/> NF/NP
17L. 24 hr URINE urea nitrogen:	_____ . ___ mg/dL
17M. 24 hr URINE creatinine:	_____ . ___ mg/dL
17N. SERUM BUN at the time this PD adequacy assessment was done	_____ mg/dL
17O. SERUM creatinine at the time this PD adequacy assessment was done	_____ . ___ mg/dL
17P. 1. Most recent 4 hour dialysate/plasma creatinine ratio (D/P Cr) from a peritoneal equilibration test (PET). (May be outside of 6-month collection time frame) 2. Date of most recent D/P Cr	_____ . _____ ___ / ___ / ___) (mm) (dd) (yyyy)
18. PERITONEAL DIALYSIS PRESCRIPTION: For the following question – record if the PD prescription in effect at the time the adequacy measures/results recorded in Question 17 was changed. Please read instructions on Page 6 before completing this section.	
18. Based on the adequacy results from questions 17A – 17O, was the prescription changed following the FIRST PD adequacy measurement performed between OCT 1, 2005 and MAR 31, 2006.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown

PERITONEAL DIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)	
19. PD ADEQUACY: The following data are requested for the SECOND PD ADEQUACY determination during the months NOV 2005 through MAR 2006. Starting with the second adequacy measurement in these months, enter the adequacy measurements/results listed below that were obtained. (Please DO NOT record more than one adequacy measurement done for any one month.) Please read instructions on Page 6 before completing this section. Enter NF/NP if information cannot be located.	
19. Was SECOND PD adequacy measurement done between 11-1-2005 and 3-31-2006?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
19A. Date of SECOND PD adequacy measurement between 11-1-2005 and 3-31-2006	____ / ____ / ____ (mm) (dd) (yyyy)
19B. Patient's dialysis modality when adequacy measures were performed	<input type="checkbox"/> CAPD <input type="checkbox"/> Cyclor (See definitions in instructions on page 6)
19B.1. If Cyclor, does the prescription include TIDAL dialysis?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
19C. Patient's weight at the time of this adequacy assessment (abdomen empty) (Circle lbs or kgs)	_____ . ____ lbs /kgs
19D. Weekly Kt/Vurea (dialysate and urine clearance)	_____ . _____
19E. Method by which V above was calculated: Check one. (If unknown please call lab.)	<input type="checkbox"/> %BW <input type="checkbox"/> Hume <input type="checkbox"/> Watson <input type="checkbox"/> Other _____
19F. Is Creatinine Clearance corrected for body surface area, using standard methods? (See instructions on page 6)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
19G. Weekly Creatinine Clearance (dialysate and urine clearance)	_____ . ____ L/wk or _____ . ____ L/wk/1.73m ²
19H. 24 hr DIALYSATE volume (prescribed and ultrafiltration)	_____ mL
19I. 24 hr DIALYSATE urea nitrogen:	_____ . ____ mg/dL
19J. 24 hr DIALYSATE creatinine:	_____ . ____ mg/dL
19K. 24 hr URINE volume: (If 24 hr urine was not located check NF/NP.)	_____ mL <input type="checkbox"/> NF/NP
19L. 24 hr URINE urea nitrogen:	_____ . ____ mg/dL
19M. 24 hr URINE creatinine:	_____ . ____ mg/dL
19N. SERUM BUN at the time this PD adequacy assessment was done	_____ mg/dL
19O. SERUM creatinine at the time this PD adequacy assessment was done	_____ . ____ mg/dL
19P. If the patient has had a 4-Hour D/P Cr performed from a PET since the time of the first adequacy test, during the 6 month collection time frame, enter the value and the date the test was performed. If not performed, enter NP.	_____ . _____ ____ / ____ / ____ (mm) (dd) (yyyy)
20. PERITONEAL DIALYSIS PRESCRIPTION: For the following question – record if the PD prescription in effect at the time the adequacy measures/results recorded in Question 19 was changed. Please read instructions on Page 6 before completing this section.	
20. Based on the adequacy results from questions 19A – 19O, was the prescription changed following the SECOND PD adequacy measurement performed between NOV 1, 2005 and MAR 31, 2006.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown

PERITONEAL DIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)
<p>INSTRUCTIONS FOR COMPLETING QUESTIONS 15 AND 16 (Continued from page 1): To answer questions 15 and 16, review the patient’s clinic or facility medical record FOR EACH TWO MONTH TIME PERIOD: OCT 1, 2005 through NOV 30, 2005, DEC 1, 2005 through JAN 31, 2006, and FEB 1, 2006 through MAR 31, 2006. Do not leave any items blank. Enter NF/NP if the information cannot be located.</p>
<p>15A: Enter the patient’s FIRST hemoglobin (Hgb) value determined by the laboratory for EACH two-month time period. Include the date the lab was drawn. If not found or not performed during the two-month time period, enter NF/NP.</p>
<p>15B.1: Check the appropriate box to indicate if the patient had a prescription for EPOETIN or DARBEPOETIN (Aranesp™) at any time during the 28 days BEFORE the date of the hemoglobin value in 15A.</p>
<p>15C: Enter the patient’s FIRST serum ferritin concentration recorded EACH two-month time period. Include the date the lab was drawn. If a serum ferritin concentration test was not found or not performed every two-month time period, enter the value for the time period when performed and record NF/NP for the other time period(s).</p>
<p>15D: Enter the patient’s FIRST % transferrin saturation (TSAT) recorded EACH two-month time period. Include the date the lab was drawn. If a % transferrin saturation (TSAT) test was not found or not performed every two-month time period, enter the value for the time period when performed and record NF/NP for the other time period(s).</p>
<p>15E: Check either “Yes”, “No”, or “Unknown” to indicate if iron was prescribed at any time during the two-month time periods.</p>
<p>15F: If the answer to 15E is “Yes”, please check the appropriate space to indicate the route of iron administration (intravenous [IV] or by mouth [PO]) for each two-month time period. Check every route of administration that was prescribed each time period.</p>
<p>16A: Enter the patient’s FIRST serum calcium recorded EACH two-month time period. Include the date the lab was drawn.</p>
<p>16B: Enter the patient’s FIRST serum phosphorus recorded EACH two-month time period. Include the date the lab was drawn.</p>
<p>16C: Enter the patient’s FIRST serum albumin recorded EACH two-month time period. Include the date the lab was drawn.</p>
<p>16D: Check the method used by the laboratory to determine the serum albumin value (bromocresol green or bromocresol purple). If you do not know what method the laboratory used, call the lab to find out this information.</p>
<p>INSTRUCTIONS FOR COMPLETING QUESTIONS 17 THROUGH 20: To answer questions 17 through 20 review the patient’s clinic or facility medical record and provide the requested data for each of the first two adequacy measurements and PD prescriptions in effect at the time the adequacy measurements were done during the months OCT 2005 through MAR 2006. DO NOT record more than one adequacy measurement done for any one month.</p>
<p>17. Check “Yes”, “No”, or “Unknown” to indicate if a PD adequacy measurement was done between OCT 1, 2005 and MAR 31, 2006.</p>
<p>17A: Enter the first date on which PD adequacy of dialysis was assessed for the first measure obtained between OCT 1, 2005 and MAR 31, 2006. DO NOT record more than one PD adequacy measurement done for any one month.</p>
<p>17B: Check the modality of peritoneal dialysis this patient was on at the time the corresponding adequacy of dialysis measure was obtained. CHECK either CAPD or Cycler. CAPD includes patients with one overnight exchange using an assist device. Cycler includes patients using an automated device for exchanges.</p>
<p>17B.1: If answer to 17B is cycler, check “Yes”, “No”, or “Unknown” to indicate whether this patient’s peritoneal dialysis prescription included TIDAL dialysis. TIDAL patients are cycler patients for whom the dialysate is partially drained between some exchanges.</p>
<p>17C: Enter the patient’s weight (with abdomen empty) at the clinic/facility visit when the adequacy measurements were obtained, circle lbs or kgs as appropriate. If abdomen is not empty for weight, subtract the weight of the fill fluid from the measured patient weight.</p>

PERITONEAL DIALYSIS CLINICAL PERFORMANCE MEASURES DATA COLLECTION FORM 2006 (CONTINUED)
17D: Enter the TOTAL WEEKLY Kt/Vurea for the first adequacy measurement indicated on 17A between OCT 1, 2005 and MAR 31, 2006. NOTE: Whether or not you have a value for weekly Kt/Vurea for this adequacy assessment, please complete the corresponding values for questions 17H-17I for 24-hour dialysate volume, 24-hour dialysate urea nitrogen and question 17K for 24-hour urine volume. If the patient is not anuric, complete the corresponding value for question 17L, the 24-hour urine urea nitrogen, if this value is available. Enter NF/NP for all values when not found or not performed. If your unit calculates a daily Kt/Vurea, multiply this result by 7.0 and enter the result in the appropriate space(s). If this patient did not dialyze each day of the week, then multiply the daily Kt/Vurea by the number of days the patient did dialyze.
17E: Check the method used to calculate the V in the Kt/Vurea measurement; % BW = percent of body weight; Hume and Watson are two nomograms used to calculate V based on several of these parameters - weight, height, age, gender. If method used to calculate V is not known, please call lab to ascertain method. Please do not leave blank.
17F: Check Yes or No if the weekly creatinine clearance was normalized for body surface area (i.e., the result is multiplied by 1.73m ² and divided by the patient's body surface area [BSA]). Standard methods for establishing BSA are: the DuBois and DuBois method; the Gehan and George method; and the Haycock method. If you do not have this information, call the laboratory that provided the creatinine clearance value for this information. Please do not leave blank.
17G: Enter the TOTAL WEEKLY CREATININE CLEARANCE for the first adequacy measurement indicated on 17A between OCT 1, 2005 and MAR 31, 2006. NOTE: Whether or not you have a value for weekly creatinine clearance for this adequacy assessment, please complete the corresponding values for questions 17H and 17J for 24-hour dialysate volume, 24-hour dialysate creatinine and question 17K for 24-hour urine volume. If the patient is not anuric, complete the corresponding value for question 17M, the 24-hour urine creatinine, if this value is available. Enter NF/NP for all values when not found or not performed. If your unit calculates a daily creatinine clearance multiply this result by 7.0 and enter the result in the appropriate space(s). If this patient did not dialyze each day of the week, then multiply the daily creatinine clearance by the number of days the patient did dialyze.
17H, I, and J: Enter the measured 24-hour DIALYSATE volume (includes prescribed and ultrafiltration volumes), urea nitrogen and creatinine obtained for the first adequacy measurement obtained between OCT 1, 2005 and MAR 31, 2006. If a 24-hour dialysate volume, urea nitrogen or creatinine were NOT measured in this time period, enter NF/NP (for not found or not performed) in the appropriate spaces. ONLY ENTER ACTUAL MEASURED 24-HOUR DIALYSATE VOLUME. DO NOT ENTER AN EXTRAPOLATED DIALYSATE VOLUME. Please report the 24-hour dialysate volume as a combination of the prescribed fill volume and the ultrafiltration volume.
17K, L, and M: Enter the 24-hour URINE volume, urea nitrogen and creatinine obtained for the first adequacy assessment obtained between OCT 1, 2005 and MAR 31, 2006. ONLY ENTER ACTUAL MEASURED 24-HOUR URINE VOLUME—DO NOT ENTER AN EXTRAPOLATED URINE VOLUME. If 24-hour urine volume was not collected check NF/NP for not found or not performed. If NF/NP is checked, SKIP TO QUESTION 17N. If urine urea nitrogen and creatinine were not found or not measured in this time period, enter NF/NP in the appropriate spaces.
17N, O: Enter the SERUM BUN and SERUM CREATININE obtained for the first PD adequacy assessment obtained between OCT 1, 2005 and MAR 31, 2006. Enter NF/NP in the appropriate spaces for all time periods when not found or not performed.
17P:(1) Enter the most recent 4 hour dialysate/plasma creatinine ratio (D/P Cr) from a peritoneal equilibration test (PET). (2) Enter the date of the most recent D/P Cr. The test result and corresponding date of the most recent D/P Cr may be outside the 6-month study period. If never found or performed record NF/NP. Date cannot be after 3/31/06 or prior to the first day of peritoneal dialysis.
18: Check "Yes", "No", or "Unknown", indicating whether the PD prescription changed following the first PD adequacy measurement performed between OCT 1, 2005 and MAR 31, 2006.
19: Check 'Yes', 'No', or 'Unknown' to indicate if a PD adequacy measurement was done between NOV 1, 2005 and MAR 31, 2006.
19A-O: See instructions for 17A-17O and complete for SECOND PD adequacy measurement performed between NOV 1, 2005 and MAR 31, 2006. DO NOT record more than one PD adequacy measurement done for any one month.
19P: Record the value and date of the patient's PET if a new one was performed since the time of the first adequacy test during this 6-month collection time frame. If not performed enter NP.
20: Check "Yes", "No", or "Unknown", indicating whether the PD prescription changed following the SECOND PD adequacy measurement performed between NOV 1, 2005 and MAR 31, 2006.

Appendix 4. Centers for Medicare & Medicaid Services (CMS) Offices and ESRD Networks

CMS Offices

Centers for Medicare & Medicaid Services
Office of Clinical Standards & Quality
Quality Measurement and Health Assessment
Group
Mailstop S3-02-01
7500 Security Boulevard
Baltimore, MD 21244
(410) 786-5785

Centers for Medicare & Medicaid Services -
Region I
Division of Clinical Standards and Quality,
Clinical Standards Branch
Room 2275
JFK Federal Building
Boston, MA 02203-0003
(617) 565-3136

Centers for Medicare & Medicaid Services -
Region VI
Division of Clinical Standards and Quality
Room 714
1301 Young Street
Dallas, TX 75202
(214) 767-4443

Centers for Medicare & Medicaid Services -
Region VII
Division of Clinical Standards and Quality,
Medical Review Branch
Richard Bolling Federal Building
601 East 12th Street, Room 242
Kansas City, MO 64106-2808
(816) 426-5746

Centers for Medicare & Medicaid Services -
Region X
Division of Clinical Standards and Quality
2201 Sixth Avenue, Mail Stop (RX-42)
Seattle, WA 98121-2500
(206) 615-2317

ESRD Networks

ESRD Network Organization No. 1
ESRD Network of New England, Inc.
30 Hazel Terrace
Woodbridge, CT 06525
Region I: ME, NH, VT, MA, CT, RI
(203) 387-9332

ESRD Network Organization No. 2
ESRD Network of New York, Inc.
11 Park Place, Suite 1503
New York, NY 10007
Region I: NY
(212) 571-8500

ESRD Network Organization No. 3
TransAtlantic Renal Council
Cranbury Gates Office Park
109 South Main Street, Suite 21
Cranbury, NJ 08512-9595
Region I: NJ, PR, VI
(609) 490-0310

ESRD Network Organization No. 4
40 24th Street, Suite 410
Pittsburgh, PA 15222
Region: DE, PA
(412) 325-2250

ESRD Network Organization No. 5
Mid-Atlantic Renal Coalition
1527 Huguenot Road
Midlothian, VA 23113
Region I: DC, MD, VA, WV
(804) 794-3757

ESRD Network Organization No. 6
Southeastern Kidney Council, Inc.
1000 St. Albans Drive
Suite 270
Raleigh, NC 27609
Region VI: GA, NC, SC
(919) 855-0882

ESRD Network Organization No. 7
FMQAI: The Florida ESRD Network
5201 West Kennedy Boulevard
Tampa, FL 33609
Region: FL
(813) 383-1530

ESRD Network Organization No. 8
Network Eight, Inc.
P.O. Box 55868
Jackson, MS 39296-5868
Region VI: AL, MS, TN
(601) 936-9260

ESRD Network Organization No. 9 & 10
The Renal Network, Inc.
911 East 86th Street, Suite 202
Indianapolis, IN 46240-1858
Region VII: KY, IN, OH, IL
(317) 257-8265

ESRD Network Organization No. 11
Renal Network of the Upper Midwest, Inc.
1360 Energy Park Drive, Suite 200
St. Paul, MN 55108
Region: MI, MN, ND, SD, WI
(651) 644-9877

ESRD Network Organization No. 12
7505 NW Tiffany Springs Parkway, Suite 230
Kansas City, MO 64153
Region VII: MO, IA, NE, KS
(816) 880-9990

ESRD Network Organization No. 13
4200 Perimeter Center Drive, Suite 102
Oklahoma City, OK 73112-2314
Region: AR, LA, OK
(405) 942-6000

ESRD Network Organization No. 14
ESRD Network of Texas, Inc.
14114 Dallas Parkway, # 660
Dallas, TX 75240-4349
Region VI: TX
(972) 503-3215

ESRD Network Organization No. 15
Intermountain ESRD Network, Inc.
1301 Pennsylvania Street, Suite 750
Denver, CO 80203-5012
Region X: NM, CO, WY, UT, AZ, NV
(303) 831-8818

ESRD Network Organization No. 16
Northwest Renal Network
4702 42nd Avenue, SW
Seattle, WA 98116
Region X: MT, AK, ID, OR, WA
(206) 923-0714

ESRD Network Organization No. 17
TransPacific Renal Network
4470 Redwood Highway, Suite 102
San Rafael, CA 94903
Region X: No. CA, HI, Mariana Isl., GU, AS
(415) 472-8590

ESRD Network Organization No. 18
Southern California Renal Disease Council, Inc.
6255 Sunset Boulevard, Suite 2211
Los Angeles, CA 90028
Region X: So. CA
(323) 962-2020

Appendix 5. List of Publications and Abstracts of ESRD CPM and Core Indicators Data

Publications on Adult Patients

1. McClellan WM, Frederick P, Helgerson S, Hayes R, Ballard D, McMullan M: A Health Care Quality Improvement Program for End-Stage Renal Disease (ESRD). *Health Care Financ Rev* 16:129-140, 1995
2. McClellan WM, Helgerson S, Frederick P, Wish J: Implementing the Health Care Quality Improvement Program in the Medicare End-Stage Renal Disease Program: A new era of quality improvement. *Adv Ren Replace Ther* 2:89-95, 1995
3. McClellan Wm: Quality of patient care in the Medicare End-Stage Renal Disease (ESRD) Program: The basis and implementation of the 1994-1997 ESRD Health Care Quality Improvement Program (HCQRP). *Curr Opin Nephrol and Hypertens* 5:224-229, 1996
4. Helgerson SD, McClellan WM, Frederick PR, Beaver SK, Frankenfield DL, McMullan M: Improvement in adequacy of delivered dialysis for adult in-center hemodialysis patients in the United States, 1993 to 1995. *Am J Kidney Dis* 29:851-861,1997
5. Rocco MV, Flanigan MJ, Beaver S, Frederick P, Gentile DE, McClellan WM, et al: Report from the 1995 Core Indicators for Peritoneal Dialysis Study Group. *Am J Kidney Dis* 30:165-173, 1997
6. Flanigan MJ, Rocco MV, Frankenfield DL, Bailie G, Frederick PR, Prowant BF, et al: 1996 Peritoneal Dialysis Core Indicators Report. *Am J Kidney Dis* 32:1-9, 1998
7. Flanigan MJ, Bailie GR, Frankenfield DL, Frederick PR, Prowant BF, Rocco MV: 1996 Peritoneal Dialysis Core Indicators Study: Report on nutritional indicators. *Perit Dial Int* 18:489-496,1998
8. Frederick PR, Frankenfield DL, Biddle MG, Sims TW: Changes in dialysis units' quality improvement practices from 1994 to 1996. *ANNA J* 25(5):469-478, 1998
9. Frankenfield DL, McClellan WM, Helgerson SD, Lowrie EG, Rocco MV, Owen WF: Relationship between urea reduction ratio, demo-graphic characteristics, and body weight for patients in the 1996 national ESRD Core Indicators Project. *Am J Kidney Dis* 3:584-591, 1999
10. Rocco MV, Flanigan MJ, Prowant B, Frederick P, Frankenfield DL: Cyler adequacy and prescription data in a national cohort sample: The 1997 ESRD Core Indicators Report. *Kidney Int* 55:2030-2039, 1999
11. Frankenfield DL, Prowant BF, Flanigan MJ, Frederick PR, Bailie GR, Helgerson SD, et al: Trends in clinical indicators of care for adult peritoneal dialysis patients in the U.S., 1995-1997. *Kidney Int* 55:1998-2010, 1999
12. Bailie GR, Frankenfield DL, Prowant BF, McClellan WM, Rocco MV: Erythropoietin and iron use in peritoneal dialysis patients. Report from the 1997 HCFA End-Stage Renal Disease Core Indicators Project. *Am J Kidney Dis* 33:1187-1189, 1999
13. Flanigan MJ, Rocco MV, Frankenfield D, Bailie G, Frederick P, Prowant B, et al: 1997 Peritoneal Dialysis Core Indicators Study: Dialysis adequacy and nutritional indicators report. *Am J Kidney Dis* 33(6):e3, 1999
14. Flanigan MJ, Rocco MV, Frankenfield D: Core Indicators Study –Anemia in peritoneal dialysis; Implications for future monitoring. *Semin Dial* 12:157-161, 1999
15. Owen WF Jr., Szczech L, Johnson C, Frankenfield D: National perspective on iron therapy as a clinical performance measure for maintenance hemodialysis patients. *Am J Kidney Dis* 34 S5-S11, 1999 (Suppl 2)
16. Frankenfield DL, Rocco MV, Frederick PR, Pugh J, McClellan WM, Owen WF Jr: Racial/ethnic analysis of selected intermediate out-comes for hemodialysis patients: Results from the 1997 ESRD Core Indicators Project. *Am J Kidney Dis* 34:721-730, 1999
17. McClellan WM, Frankenfield DL, Frederick PR, Flanders WD, Alfaro-Correa A, Rocco M, et al: Can dialysis therapy be improved? A Report from the ESRD Core Indicators Project. *Am J Kidney Dis* 34:1075-1082 1999
18. Flanigan MJ, Prowant BF, Frankenfield D, Rocco MV: Long-term successful peritoneal dialysis: End-Stage Renal Disease Core Indicators Study data. *Adv Perit Dial* 15:105-111, 1999
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26. Frankenfield DL, Johnson CA: Current Management of Anemia in Adult Hemodialysis Patients with End-Stage Renal Disease. *Am J Health Syst Pharm* 59:429-435, 2002
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31. Rocco MV, Frankenfield DL, Prowant B, Frederick P, Flanigan MJ: Risk factors for early mortality in U.S. peritoneal dialysis patients: Impact of residual renal function. *Perit Dial Int* 22:371-379,2002
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33. Owen WF Jr., Szczech LA, Frankenfield DL: Healthcare system interventions for inequality in quality: corrective action through evidence-based medicine. *J Natl Med Assn* 94:83S-91S, 2002
34. Frankenfield DL, Rocco MV, Roman SH, McClellan WM: Survival advantage for adult Hispanic hemodialysis patients? Findings from the End-Stage Renal Disease Clinical Performance Measures Project. *J Am Soc Nephrol* 12:180-186, 2003
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36. Rocco MV, Frankenfield DL, Prowant B, Frederick P, Flanigan MJ: Response to inadequate dialysis in chronic peritoneal dialysis patients. Results from the 2000 Centers for Medicare & Medicaid (CMS) ESRD Peritoneal Dialysis Clinical Performance Measures (PD-CPM) Project. *Am J Kidney Dis*, 4:840-848, 2003
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Publications on Pediatric Patients

1. Frankenfield DL, Neu AM, Warady BA, Watkins SL, Friedman AL, Fivush BA: Adolescent Hemodialysis: Results of the 2000 ESRD Clinical Performance Measures Project. *Pediatr Nephrol* 17:10-15, 2002
2. Frankenfield DL, Neu AM, Warady BA, Fivush BA, Johnson CA, Brem AS: Anemia in pediatric hemodialysis patients: Results from the 2001 ESRD Clinical Performance Measures Project. *Kidney Int* 64:1120-1124, 2003
3. Neu AM, Fivush BA, Warady BA, Watkins SL, Friedman AL, Brem AS, et al: Longitudinal analysis of intermediate outcomes in adolescent hemodialysis patients. *Pediatr Nephrol* 18:1172-1176, 2003
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5. Gorman G, Fivush B, Frankenfield D, Warady B, Watkins S, Brem A, et al: Short stature and growth hormone use in pediatric hemodialysis patients. *Pediatr Nephrol* 12:1794-1800, 2005
6. Fadrowski JJ, Frankenfield DL, Friedman AL, Warady BA, Neu AM, Fivush BA: Impact of specialization of primary nephrologist on the care of pediatric hemodialysis patients. *Am J Kidney Dis* 47:115-121, 2006

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2. Rocco M, Flanigan M, Frederick P, Gentile D, Helgerson S, Krisher J, et al: 1995 ESRD Peritoneal Dialysis Core Indicators Study (PD-CIS): Serum albumin and dialysis adequacy. *J Am Soc Nephrol* 7:1067A, 1996
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2006 NATIONAL CPM DATA COLLECTION - NATIONAL AND NETWORK PROFILES

for Adult (aged > 18) In-Center Hemodialysis Patients

Network	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
ANEMIA MANAGEMENT																			
Median hgb (g/dL)	12.0	12.0	12.0	12.0	12.0	12.0	12.1	12.0	12.0	12.1	12.1	11.9	11.9	12.0	12.1	12.0	12.0	12.0	12.0
% Pts with mean hgb ≥ 11g/dL	85	82	81	83	84	84	84	79	80	85	83	80	80	87	85	83	87	88	84
% Targeted [^] pts with mean hgb 11-12.0 g/dL	40	37	32	33	36	36	33	32	34	32	36	35	36	36	32	35	39	38	35
% Pts with mean Hb < 10 g/dL	5	7	6	4	5	5	4	6	7	7	5	5	5	4	5	6	3	2	5

IRON MANAGEMENT

% Pts with mean TSAT ≥ 20%	76	79	78	78	81	83	81	76	75	77	77	73	77	82	77	68	71	83	78
Median TSAT %	25	26	26	26	27	28	27	25	25	25	26	25	25	27	26	23	25	27	26
% Pts with mean ferritin ≥ 100 ng/mL	96	92	95	93	94	97	93	96	94	94	95	95	95	95	93	94	95	95	95
Median ferritin ng/mL	541	526	533	472	545	569	555	515	533	574	526	478	556	603	482	443	508	571	536
% Pts prescribed IV iron	72	63	71	76	69	69	66	75	69	72	69	66	68	69	70	69	69	67	69

ALBUMIN

% Pts with mean serum albumin ≥ 4.0/3.7 g/dL (BCG/BCP) ^{^^}	32	31	33	28	36	33	36	35	28	32	31	25	31	31	35	31	37	39	33
% Pts with mean serum albumin ≥ 3.5/3.2 g/dL (BCG/BCP) ^{^^}	80	80	75	77	78	84	83	81	79	82	79	77	82	81	83	80	79	84	80
Median serum BCG albumin (g/dL)	3.8	3.8	3.8	3.8	3.9	3.8	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.9	3.9	3.8
Median serum BCP albumin (g/dL)	3.4	3.4	3.3	3.1	3.5	*	3.4		3.6	3.6	3.6	3.4	*	*	*	3.4	3.5	3.6	3.5

[^] See Appendix 1 for complete definition of targeted patients for this CPM

^{^^} BCG/BCP-Bromocresol Green/Bromocresol Purple Laboratory Methods

* Value suppressed because n < 11

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

**2006 NATIONAL CPM DATA COLLECTION - NATIONAL AND NETWORK PROFILES
for Adult (aged ≥ 18) In-Center Hemodialysis Patients**

Network	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	U.S.
Median	9.2	9	9.1	9.2	9.2	9.3	9.2	9.2	9	9	9	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
% Pts with adjusted calcium 8.4 - 10.2	82	84	81	81	78	82	82	81	85	85	83	82	86	84	82	85	85	80	83
% Pts with monthly calcium reported	87	90	85	91	85	86	85	89	86	87	90	86	85	91	85	91	89	87	87

PHOSPHORUS

	5.4	5.1	5.2	5.1	5.3	5.5	5.4	5.6	5.3	5.3	5.3	5.6	5.5	5.5	5.2	5.3	5.2	5.4	5.3
Median	5.4	5.1	5.2	5.1	5.3	5.5	5.4	5.6	5.3	5.3	5.3	5.6	5.5	5.5	5.2	5.3	5.2	5.4	5.3
% Pts with mean phosphorus 3.5 - 5.5	48	54	52	51	47	44	48	43	49	52	58	42	45	45	51	48	51	49	49
% Pts with monthly phosphorus reported	88	89	85	91	85	86	85	89	86	87	90	86	85	91	86	91	89	86	87

Appendix 7. 2006 ESRD Outcome Comparison Tool - Adult In-Center Hemodialysis Patients - National and Network Data are from October - December 2005

Enter your Network data from Appendix 8 and use this tool to document and compare your facility outcomes to the national data and your Network data.

	U.S.	Network	Facility
ADEQUACY OF DIALYSIS			
Percent of patients with a mean spKt/V ≥ 1.2	91%		
Mean \pm SD spKt/V	1.55 \pm 0.27		
Mean \pm SD dialysis session length (minutes)	216 \pm 31		
Mean \pm SD URR	72 \pm 7%		
VASCULAR ACCESS			
Percent of prevalent patients dialyzed with an AV fistula	44%		
Percent of incident patients dialyzed with an AV fistula	54%		
Percent of prevalent patients dialyzed with a Graft with AVF	3%		
Percent of prevalent patients dialyzed with a Graft without AVF	26%		
Percent of prevalent patients dialyzed with a catheter	27%		
Percent of prevalent patients dialyzed with a catheter ≥ 90 days	21%		
ANEMIA MANAGEMENT			
Percent of patients with mean Hgb ≥ 11.0 g/dL	84%		
Percent of targeted* patients with mean Hb 11.0 - 12.0 g/dL	35%		
Percent of patients with mean Hgb < 10.0 g/dL	5%		
Mean \pm SD Hgb (g/dL)	12 \pm 1.2		
Percent of patients with mean TSAT $\geq 20\%$	78%		
Mean \pm SD TSAT (%)	28 \pm 11		
Percent of patients with mean serum ferritin concentration ≥ 100 ng/ml	95%		
Mean \pm SD serum ferritin concentration (ng/mL)	593 \pm 405		
Percent of patients prescribed IV iron	69%		
SERUM ALBUMIN			
Percent of patients with mean serum albumin $\geq 4.0/3.7$ g/dL (BCG/BCP)	33%		
Percent of patients with mean serum albumin $\geq 3.5/3.2$ g/dL (BCG/BCP)	80%		
Mean \pm SD serum albumin (g/dL)			
BCG	3.8 \pm 0.4		
BCP	3.4 \pm 0.5		
CALCIUM			
% Pts with adjusted calcium 8.4 - 10.2	83%		
% Pts with monthly calcium reported	87%		
Mean \pm SD calcium	9.1 \pm 0.8		
PHOSPHORUS			
% Pts with mean phosphorus 3.5 – 5.5	49%		
% Pts with monthly phosphorus reported	87%		
Mean \pm SD Phosphorus	5.5 \pm 1.6		

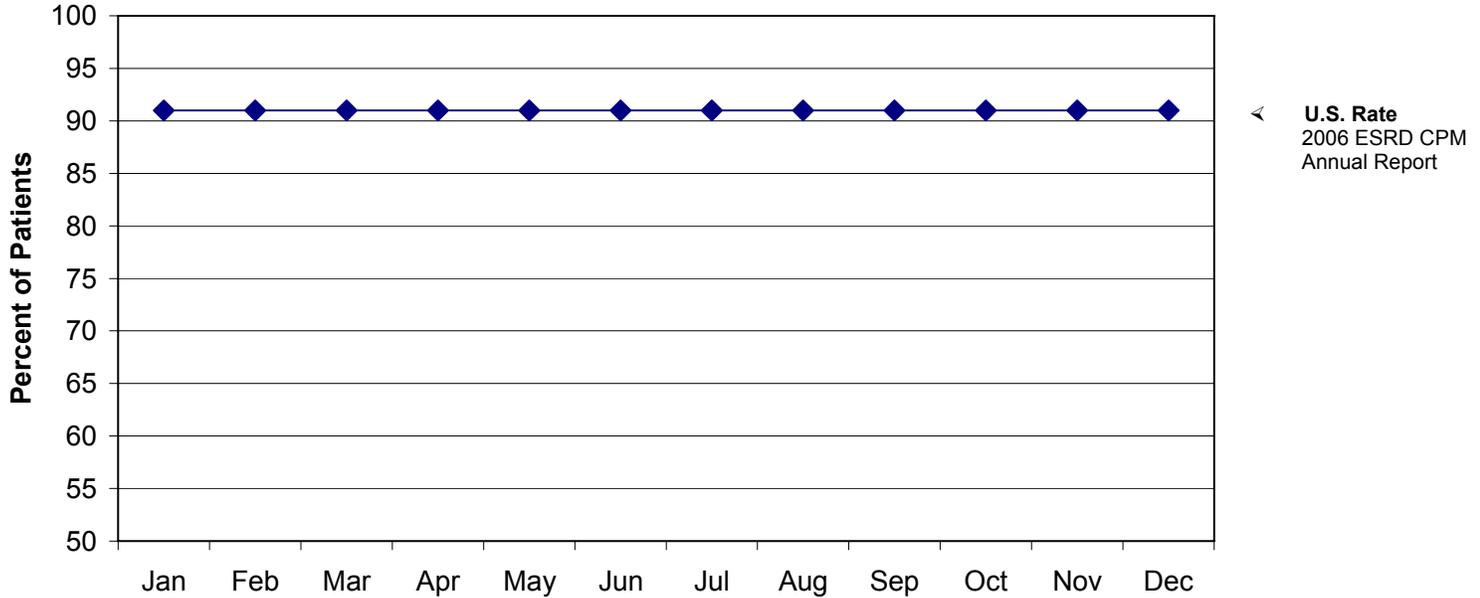
* See Appendix 1 for complete definition of targeted patients for this CPM

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

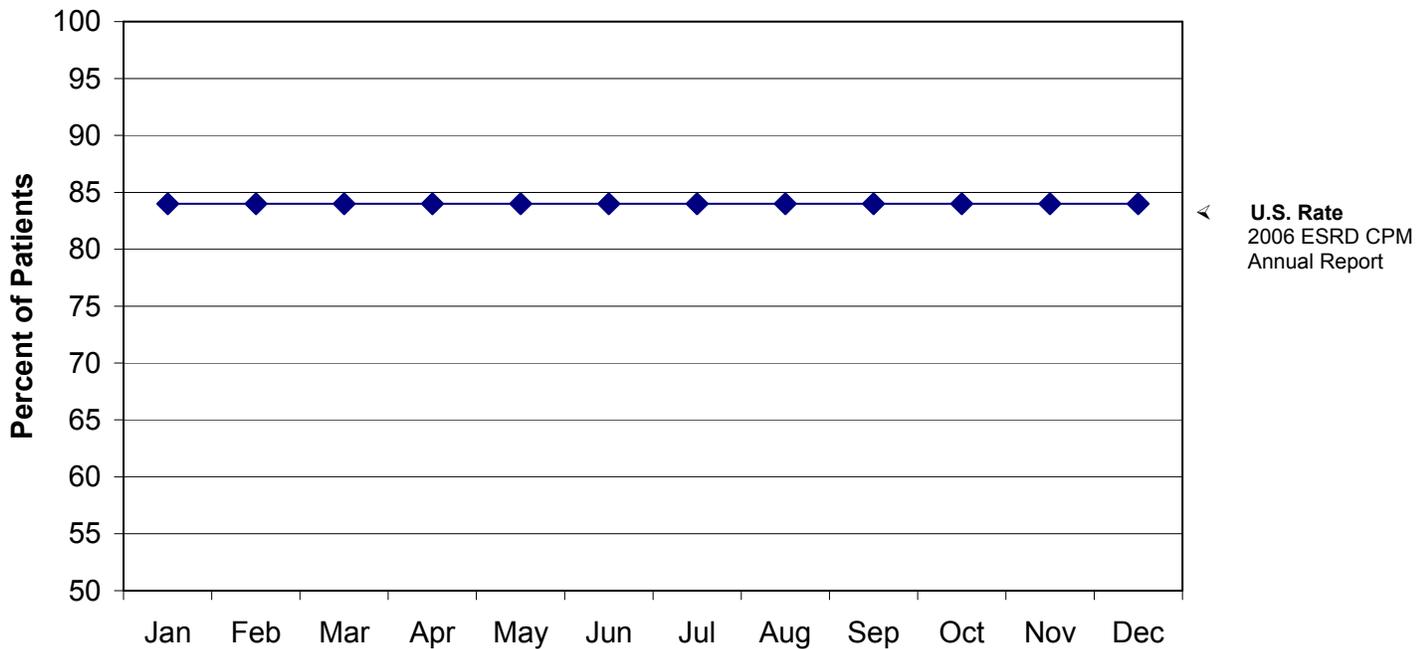
Use the following chart to plot monthly the percent of HD patients in your unit that have a $spKt/V \geq 1.2$ (U.S. = 91%). Post the chart in the facility for all to see.

Percent of Adult HD Patients with a $spKt/V \geq 1.2$ for Year _____



Use the following chart to plot monthly the percent of HD patients in your unit that have a Hgb ≥ 11 g/dL (110 g/L) (U.S. = 84%). Post the chart in the facility for all to see.

Percent of Adult HD Patients with a Hgb ≥ 11 g/dL (110 g/L) for Year _____



Appendix 8. 2006 ESRD Outcome Comparison Tool - Adult Peritoneal Dialysis Patients - National Data are from October 2005 - March 2006

Use this tool to document and compare your facility outcomes to the national data.

	U.S.	Network	Facility
ADEQUACY OF DIALYSIS			
Percent of patients measured for adequacy at least once during the six month study period (both weekly Kt/V _{urea} and weekly creatinine clearance measured)	80%		
Percent of CAPD patients with mean weekly Kt/V _{urea} ≥ 2.0	69%		
Mean ± SD weekly Kt/V _{urea} for CAPD patients	2.33 ± 0.61		
Percent of Cyclor patients with mean weekly Kt/V _{urea} ≥ 2.1	57%		
Mean ± SD weekly Kt/V _{urea} for Cyclor patients	2.26 ± 0.62		
ANEMIA MANAGEMENT			
Percent of patients with mean Hgb ≥ 11.0 g/dL	81%		
Percent of targeted* patients with mean Hgb 11.0 - 12.0 g/dL	30%		
Percent of patients with mean Hgb < 10.0 g/dL	7%		
Mean ± SD Hgb (g/dL)	12 ± 1.3		
Percent of patients with mean TSAT ≥ 20%	85%		
Mean ± SD TSAT (%)	30 ± 11		
Percent of patients with mean serum ferritin concentration ≥ 100 ng/mL	88%		
Mean ± SD serum ferritin concentration (ng/mL)	473 ± 422		
Percent of patients prescribed IV iron	28%		
SERUM ALBUMIN			
Percent of patients with mean serum albumin ≥ 4.0/3.7 g/dL (BCG/BCP)	19%		
Percent of patients with mean serum albumin ≥ 3.5/3.2 g/dL (BCG/BCP)	62%		
Mean ± SD serum albumin (g/dL) BCG	3.6 ± 0.5		
BCP	3.3 ± 0.6		
CALCIUM			
% Pts with adjusted calcium 8.4 - 10.2	78%		
% Pts with monthly calcium reported	84%		
Mean ± SD calcium	9.1 ± 0.8		
PHOSPHORUS			
% Pts with mean phosphorus 3.5-5.5	54%		
% Pts with monthly phosphorus reported	83%		
Mean ± SD	5.3 ± 1.4		

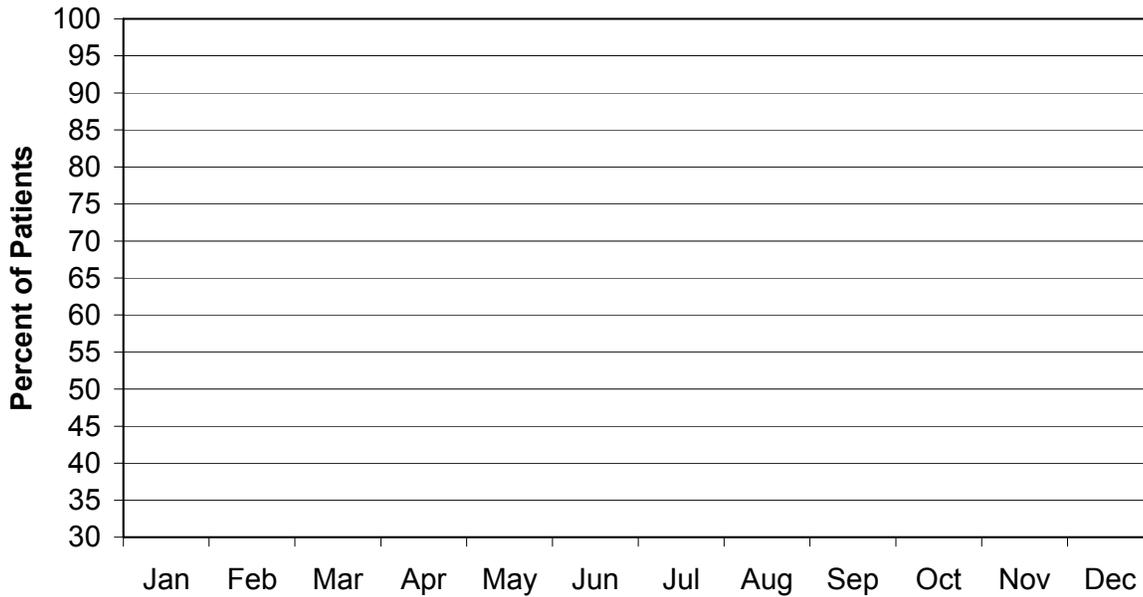
* See Appendix 1 for complete definition of targeted patients for this CPM

Note: To convert hemoglobin conventional units of g/dL to SI units (g/L), multiply by 10.

Note: To convert serum albumin conventional units of g/dL to SI units (g/L), multiply by 10.

Use the following chart to plot monthly:
 The % of adult CAPD patients in your unit that have a $Kt/V_{urea} \geq 2.0$ (U.S. = 69%).
 The % of adult Cycler patients that have a $Kt/V_{urea} \geq 2.1$ (U.S. = 57%).
 Post the chart in the facility for all to see.

Percent of Adult PD Patients Meeting NKF-K/DOQI Guidelines for Adequacy (weekly Kt/V_{urea}) for Year ____



Use the following chart to plot monthly the percent of adult PD patients in your unit that have a Hgb $\geq 11g/dL$ (110 g/L) (U.S. = 81%).
 Post the chart in the facility for all to see.

Percent of Adult PD Patients with a Hgb $\geq 11g/dL$ (110 g/L) for Year ____

