ESRD Special Project:

2004 End Stage Renal Disease Clinical Performance Measures Reliability Report

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Executive Summary

Background

In 2002, Qualis Health was selected by the Centers for Medicare & Medicaid Services (CMS) to analyze the inter-rater reliability for the data collected for the End Stage Renal Disease Clinical Performance Measures (CPM) Project. This project is a component of the Medicare End Stage Renal Disease (ESRD) Program, which was established in 1972 under the Social Security Act.

For the 2004 ESRD CPM Project, facilities that are not one of the five Large Dialysis Organization (LDO) ESRD facilities submitted manually collected data on a national random sample of medical records for adult ESRD patients and on the universe of medical records for in-center pediatric hemodialysis patients. The LDOs had an agreement with CMS to submit their data electronically, from their corporate data repositories. The LDO and non-LDO data were forwarded to the ESRD Networks electronically through the QualNet Exchange. Some of the electronically submitted data were found to be incomplete or reported erroneously, e.g., albumin data from one LDO was rounded up to the next whole number. Because of this, the ESRD Networks were asked to produce and distribute CPM forms pre-populated with LDO data to facility staff to complete missing data points and verify the pre-populated data. The sampled populations included in-center adult hemodialysis patients, adult peritoneal dialysis patients, and in-center pediatric hemodialysis patients. There were no pediatric patients in the LDO samples. From these data, five percent of each of the three samples was randomly selected and re-abstracted by ESRD Network staff to obtain the reliability sample. The facility-abstracted data and Network re-abstracted data were sent to Qualis Health to analyze and assess the extent to which there was concurrence between the two data files—the inter-rater reliability. Additional analysis was done for this year's report

comparing the reliability of the originally submitted (electronic) LDO data to the Network re-abstracted data and the revised (facility-updated) LDO data to the Network re-abstracted data. This analysis follows this report and is titled *ESRD CPM Reliability Report, Part II*.

Project Methods

To analyze the inter-rater reliability of the CPM data, the software program SAS for Windows, version 9.1 was used to compute agreement rate, concurrence, kappa statistic, and t-test statistic based on means. The agreement rate analysis was conducted on continuous data, and kappa statistics and concurrence analysis were jointly used to analyze categorical data. Paired t-tests were used to show the extent of significant difference between facility-abstracted data and Network abstracted data.

Inter-rater reliability statistics were calculated for the following in-center adult and pediatric hemodialysis and adult peritoneal dialysis categories: adequacy of dialysis data, anemia management, serum albumin, and other items including diabetes diagnosis, limb amputation, and ethnicity. In addition, for in-center adult and pediatric hemodialysis, statistics on vascular access were calculated, and for peritoneal dialysis, statistics on dialysis prescription were calculated.

Results

Adult hemodialysis CPMs

In comparing the data collection forms used by the facilities and Networks to abstract data for the adult hemodialysis CPMs, matched forms were available for 429 medical records. An analysis of the categorical data abstracted by facilities and Networks for these CPMs showed almost perfect to substantial agreement for measures relating to adequacy of dialysis, anemia management, serum albumin, and vascular access. The statistical means for

continuous facility and Network data for selected measures reflected that all but four measures were nearly identical between the two data sets. Pre-dialysis weight, post-dialysis weight, recorded Kt/V, and second EPO dose were the measures that were statistically significantly different.

The inter-rater reliability analysis for each of the tested measures showed agreement that ranged from less than moderate to nearly perfect as calculated by kappa statistic (kappa range: 0.36 to 0.93), and the level of concurrence was acceptable for 19 out of 28 items. The agreement rates for facility data compared to Network data for selected adult hemodialysis measures was acceptable for two out of nine measures.

Adult peritoneal dialysis CPMs

For the adult peritoneal dialysis CPMs, facility and Network record abstraction provided 71 matched data collection forms. A comparison of the categorical data abstracted for selected measures showed that agreement ranged from low to almost perfect. The statistical means comparison for continuous facility data and Network data showed no statistically significant difference between the data abstracted by facility and Network staff for adequacy of dialysis, anemia management, and serum albumin for the standard analysis.

The inter-rater reliability analysis for each of the tested measures showed agreement that ranged from below moderate to almost perfect as calculated by kappa statistic (kappa range: 0.16 to 0.95), and the level of concurrence was acceptable for 14 out of 22 items. In comparing the agreement of data abstracted by facilities to that re-abstracted by the Networks, the rates ranged from one relatively low data point to 8 out of 14 acceptable.

Pediatric hemodialysis CPMs

Matched data collection forms were available for 31 facility-abstracted and Network re-abstracted medical records for the pediatric hemodialysis CPMs, all of these non-LDO patients. The comparison of categorical data for selected measures related to hemodialysis

showed below moderate to perfect agreement, and the comparison of means for continuous facility and Network data was nearly identical between the two data sets.

The inter-rater reliability analysis for each of the tested measures showed agreement that ranged from below moderate to perfect as calculated by kappa statistic (kappa range: 0.30 to 1.00), and the level of concurrence was acceptable for 18 out of 28 items. The agreement rates for facility data compared to Network data for five out of nine pediatric hemodialysis measures was acceptable at ≥ 80%.

Reliability from year to year

In 2004, the inter-rater reliability of a number of items improved over 2003. Significant improvement was observed for 10 items. An item's kappa statistic was considered to have improved significantly in 2004 if it had a ≥ 0.1 increase over 2003 and a shift upward in its categorical agreement rating. Likewise, an item's kappa statistic was considered to have declined significantly if it had a ≥ 0.1 decrease from the previous year and there was a shift downwards in its categorical agreement rating. In 2004, a decline was observed for 13 items.

Conclusions

This report shows that overall there was a high rate of agreement between data abstraction conducted by dialysis facility staff and re-abstraction of records by ESRD Network staff. For items that had low inter-rater reliability, several possibilities may have accounted for the findings. Among them were lack of clear instructions, failure of abstractors to follow instructions, inaccurate completion of the data collection forms, and statistical factors related to sample size and unbalanced marginals.

An identified limitation of this study was the relatively small sample number of cases that could be re-abstracted with available resources. Also important to note is that this study examined inter-rater reliability rather than validity.

Introduction

In 2002, the Centers for Medicare & Medicaid Services (CMS) contracted with Qualis Health, a Seattle-based, nonprofit, health care quality improvement organization, to analyze the inter-rater reliability of the data collection associated with the Clinical Performance Measures (CPMs) Project for end stage renal disease (ESRD). This report presents the results of the inter-rater reliability study.

Background

In 1994, CMS collaborated with the ESRD Networks and the renal community to begin a new approach to assessing and improving health care provided to Medicare ESRD patients—the ESRD Health Care Quality Improvement Program (HCQIP). The key goal of the ESRD HCQIP is to increase, to the greatest extent possible, the number of ESRD patients who receive treatment consistent with current standards of care.

The first activity conducted as part of the ESRD HCQIP was to initiate the National/Network ESRD Core Indicators Project (CIP). The ESRD CIP was CMS's first nationwide population-based study designed to assess and identify opportunities to improve the care of patients with ESRD. This project established the first consistent clinical database for ESRD. 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 were considered "indicators" useful for triggering improvement activities.

In 1998, CMS responded to Section 4558(b) of the Balanced Budget Act (BBA) by initiating a project to develop CPMs based on the National Kidney Foundation Disease Outcomes Quality Initiative (DOQI). CMS contracted with Qualis Health to develop CPMs in each of the four topic areas addressed in the DOQI guidelines. Sixteen ESRD CPMs were developed: five for hemodialysis adequacy, three for peritoneal dialysis adequacy, four for anemia management, and four for vascular access. These initial CPMs were intended to assist dialysis facility staff, ESRD Networks, dialysis patients, and other stakeholders in conducting quality improvement initiatives and activities.

For information regarding the development of the CPMs, please see the article, "Developing Clinical Performance Measures Based on the Dialysis Outcomes Quality Initiative Clinical Practice Guidelines: Process, Outcomes, and Implications."[1]

On March 1, 1999, the ESRD CIP was merged with the ESRD CPM Project and is now known as the ESRD CPM Project. The ESRD CPMs overlap considerably with the core indicators, although a number of new measures were introduced, such as measures for assessing vascular access. In 2001, CMS expanded its CPM data collection efforts to include in-center pediatric hemodialysis patients.

During the summer of 2003, the collection of clinical data for the ESRD CPM Project was conducted on a five percent national random sample of medical records for adult hemodialysis and peritoneal dialysis patients (age $\geq$ 18 years) and on the universe of medical records for in-center pediatric hemodialysis patients ($0 < 18$ years). The hemodialysis sample was stratified by Network area. Dialysis facility staff first abstracted data for selected adult and pediatric measures.

For the reliability sample, five percent of each of the three samples was randomly selected and re-abstracted by Network staff. The facility data and Network re-abstracted data were sent to Qualis Health to analyze and assess the extent to which there was concurrence between the two data files (inter-rater reliability).

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[1] Sugarman JR, Frederick PR, Frankenfield DL, Owen WF Jr, McClellan WM. Developing clinical performance measures based on the Dialysis Outcomes Quality Initiative Clinical Practice Guidelines: process, outcomes, and implications. *Am J Kidney Dis.* 2003 Oct;42 (4):806-12.

Project Methods

Statistical Methods

The inter-rater reliability analysis was conducted by using SAS for Windows version 9.1 to compute agreement rate, concurrence, kappa statistics, and t-test statistics based on means.

Some continuous data (such as those shown in Tables 4 and 7) were re-coded as categorical data for the purpose of generating the kappa statistic. As a result, some facility-abstracted data and Network re-abstracted data may fall into the same category and thus achieve agreement, even though the values are not exactly the same. For example, Table 7 demonstrates a high level of concurrence for the data category of hemoglobin $\geq$ 9 gm/dL. As the category implies, specific hemoglobin values abstracted from the medical record are grouped together categorically with a cut-point of 9 mg/dL. Thus, a facility abstractor could have reported 11 gm/dL, while the Network re-abstractor could have reported 10 gm/dL, yet they achieve agreement because both values are placed in the same categorical field. (The designated cut-points for re-coding the categorical data were provided by CMS.)

For data that were collected in multiple months, such as the three reported hemoglobins (for the 2004 Reliability Report data were collected from October 2003 to December 2003 for the in-center hemodialysis sample, and from October 2003 to March 2004 for the peritoneal dialysis sample), data from one of the three months were randomly selected and analyzed for each patient.

All missing values were included in reliability analyses. The missing values often represented a significant proportion of the responses. In such cases, missing values may artificially inflate the level of concurrence.

Additionally, the analyses in this report did not take into account skip patterns on the data collection forms; therefore all available records for each selected data collection item were analyzed independently, except for the diabetes related items.

Agreement Rate Analysis

Agreement rate analysis was conducted on continuous data. The agreement rate was obtained by dividing the number of exact matches by the total number of abstracted records. Although there is no criterion standard for acceptable levels of agreement, we considered an acceptable agreement rate to be $\geq$ 80%.

Concurrence Analysis

Concurrence analysis is defined as the proportion of cases for which responses from the facility and the Network resulted in the same classification of the measurement (for instance, as being present, missing, or having met the set criteria).

Concurrence analysis was employed for measures described by categorical data. The method of calculation is shown in Table 1. We considered an acceptable target for concurrence to be $\geq$ 90%, although, as with agreement rates, there is no general standard for acceptable levels.

Kappa Statistic

The kappa statistic is commonly used to assess concurrence of categorical ratings as determined by two raters. Although there is no "gold standard" for acceptable ranges for the kappa statistic, kappa values of 0.4 to 0.59 typically reflect moderate agreement; 0.6 to 0.79 substantial agreement; and 0.8 to 1.0 almost perfect agreement.[2] Furthermore, for tables where the number of rows did not equal the number of columns (Tables # 12, 20, 21, 22, 23, 24, 32, 40, 45, 46, 48, 49, 52, 68, 72, 76 and 77), one observation was created in at least one cell of the missing row and/or column. This observation contained a value close to zero, which did not affect the kappa statistic, thus allowing the missing rows and/or columns to be included in the table, so that a kappa statistic could be calculated.

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[2] Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics*. 1997;33:159-74.

The level of concurrence and kappa statistic were jointly used to analyze categorical data, because the kappa statistic alone can become unreliable when the incidence rate is low or when unbalanced marginal totals occur.[3]

T-Test Statistic Based on Means

In Tables 3, 30, and 55 the results of paired t-tests show the extent of significant difference between facility-abstracted data and Network re-abstracted data. Statistical significance was considered to have occurred for p-values ≤ 0.05.

Data Collection

Two data collection forms were used in the 2004 ESRD CPM Project. One form was used to abstract the records of in-center adult hemodialysis patients and in-center pediatric hemodialysis patients; the other form was used to abstract the records of adult peritoneal dialysis patients. Facility staff conducted the abstractions in the late spring and early summer of 2004, while Network staff conducted re-abstractions between the months of July and October 2004. Network staff either received medical records from the facilities or went to the facilities to re-abstract the data. Both the facility and Network data sets were entered into a computer database using VISON software at each Network, and SAS data files were created and forwarded to Qualis Health for analysis.

Concurrence analysis for the in-center hemodialysis and peritoneal dialysis samples was conducted by using the patient identification number and pairing the facility data with the Network data.

Sample and Measures: Hemodialysis CPMs

A random sample of adult in-center hemodialysis medical records and the universe of in-center pediatric hemodialysis medical records were abstracted. Staff from adult hemodialysis facilities abstracted data from the medical records of 5% of randomly selected

adult hemodialysis patients who received care from October 2003 through December 2003 at their facilities. Staff from pediatric hemodialysis facilities abstracted data from the medical records of in-center pediatric hemodialysis patients who received care from October 2003 through December 2003. During late summer and into the fall of 2004, Network staff re-abstracted 429 of the adult hemodialysis and 31 of the pediatric hemodialysis medical records, or approximately 5% of the original records.[4]

The inter-rater reliability statistics for the facility and Network data were calculated for the following in-center adult and pediatric hemodialysis items:

Adequacy of dialysis data
- Recorded single-pool Kt/V
- Method used to calculate the recorded Kt/V
- Residual urine function used to calculate Kt/V
- Number of prescribed dialysis times per week
- Pre- and post-dialysis BUN
- Pre- and post-dialysis weights

Anemia Management
- Pre-dialysis hemoglobin ≥ 9 gm/dL and ≥ 11 gm/dL
- Serum ferritin concentration ≥ 100 ng/mL
- Transferrin saturation $\geq 20\%$
- Epoetin prescription
- Epoetin administration dose
- Prescribed route of epoetin administration
- Total dose of IV iron administration
- Mean hemoglobin
- Mean transferrin saturation
- Mean serum ferritin concentration

Serum albumin
- Serum albumin values (≥ 3.5 gm/dL or ≥ 3.2 gm/dL based on laboratory method used)
- Laboratory method used to measure serum albumin
- Mean serum albumin

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[3] Feinstein AR, Cicchetti DV. High agreement but low kappa: I. The problems of two paradoxes. *J Clin Epidemiol*. 1990; 43:543-549.

[4] The number of re-abstracted hemodialysis and peritoneal dialysis cases was minimized to decrease costs and impact on Network and facility staff.

Vascular Access

- The type of access used on the last hemodialysis session on or between 10/1/2003 and 12/31/2003
- Reason for catheter or port access, if used for access between 10/1/2003 and 12/31/2003
- Use of catheter or port access ≥ 90 days, if used for access between 10/1/2003 and 12/31/2003
- Presence of routine monitoring for stenosis and the method used for monitoring for stenosis, when synthetic grafts, bovine grafts, or AV fistulas were used for access
- The type of access used at the initiation of a maintenance course of hemodialysis and 90 days later, if between January 1, 2003 and August 31, 2003

Other hemodialysis items

- Limb amputation
- Ethnicity
- Diabetes diagnosis
- Medication use for diabetes control
- Insulin use for diabetes

Sample and Measures: Adult Peritoneal Dialysis CPMs

Staff from adult peritoneal dialysis facilities abstracted data from the medical records of 5% of randomly selected adult peritoneal dialysis patients who received care from October 2003 through March 2004 through the Medicare program. Network staff re-abstracted 71 of these medical records, or approximately 5% of the medical records originally abstracted by dialysis facility staff.

The inter-rater reliability statistics for the facility and Network data were calculated for the following adult peritoneal dialysis items:

Adequacy of dialysis data

- Weekly Kt/V$_{urea}$ from dialysate and urine
- Method used to calculate the V in the recorded Kt/V$_{urea}$
- Weekly creatinine clearance
- Creatinine clearance corrected for body surface area

- First clinic visit weight
- Adequacy assessment weight
- 24 hour dialysate volume
- 24 hour dialysate urea nitrogen
- 24 hour dialysate creatinine
- 24 hour urine volume
- 24 hour urine urea nitrogen
- 24 hour urine creatinine
- Serum BUN
- Serum creatinine

Anemia Management

- Hemoglobin ≥ 9 gm/dL and ≥ 11 gm/dL
- Serum ferritin concentration ≥ 100 ng/mL
- Transferrin saturation $\geq 20\%$
- Epoetin prescription
- Prescribed route of epoetin administration
- Epoetin administration dose
- IV iron administration dose
- Mean hemoglobin
- Mean transferrin saturation
- Mean serum ferritin concentration

Serum albumin

- Serum albumin values (≥ 3.5 gm/dL or ≥ 3.2 gm/dL based on laboratory method used)
- Laboratory method used to measure serum albumin
- Mean serum albumin

Prescription

- Number of dialysis days per week for CAPD patients
- Total number of dialysis exchanges per 24 hours for CAPD patients
- Total number of dialysis exchanges during nighttime for cycler patients
- Total number of dialysis exchanges during daytime for cycler patients
- Prescription changed

Other adult peritoneal dialysis items

- Limb amputation
- Ethnicity
- Diabetes diagnosis
- Medication use for diabetes control

- Insulin use for diabetes

Results

Adult Hemodialysis CPMs

Matched data collection forms were available for 429 facility-abstracted and Network re-abstracted medical records.

Table 2 summarizes the comparison between facility and Network categorical data for selected adult hemodialysis indicators of care. Substantial to almost perfect agreement occurred for measures relating to adequacy of dialysis, anemia management, serum albumin, and vascular access.

Table 3 shows the comparison of means for continuous facility and Network data for selected adult hemodialysis CPMs (excluding measures related to access). All but four of the selected adult hemodialysis measures were nearly identical between the two data sets. Recorded Kt/V, pre-dialysis weight, post-dialysis weight, and second EPO dose were statistically significantly different.

Tables 4 through 27 provide the inter-rater reliability analyses for each of the tested measures, including those related to access. When the recorded Kt/V ≥ 1.2 was used as a cutoff threshold for adequacy of dialysis, the kappa was 0.73, indicating substantial agreement (Table 4). The data regarding the methods used to calculate the recorded Kt/V also indicated substantial agreement (kappa 0.67) (Table 5). However, only moderate agreement was found between facility-abstracted data and Network re-abstracted data regarding whether or not residual urine function was used to calculate Kt/V (kappa 0.56) (Table 6). The kappa statistic indicated substantial or nearly perfect agreement for all anemia management and serum albumin measures. (Tables 7 through 14).

Concurrence regarding the types of access used was acceptable, ranging from 90% to 95% (Tables 15, 20, and 21). The kappa statistic for the type of access used on the last adult hemodialysis session (Table 15) showed near

perfect agreement between facility-abstracted data and Network re-abstracted data (kappa 0.86). The kappa statistic for reason for catheter or port access (Table 16), the catheter duration (Table 17), type of access used at the initiation (Table 20) and type of access used 90 days after initiation (Table 21) reflect substantial agreement between abstractors, while the kappa statistic for presence of routine stenosis monitoring (Table 18) and different types of stenosis monitoring methods (Tables 19a – 19e) showed low to moderate agreement (ranging from 0.36 to 0.58).

Concurrence regarding the presence of an amputation (Table 22) was statistically acceptable (93%), and the kappa of 0.65 indicates substantial agreement.

The kappa statistics for ethnicity (Table 24) was substantial at 0.74, and the level of concurrence was acceptable (92%). For the diabetes related items (Tables 25, 26, and 27) the range was moderate to almost perfect agreement for kappa statistics at 0.89, 0.59 and 0.61, respectively, and substantial to almost perfect concurrence levels at 94%, 79% and 84%, respectively.

Table 28 provides agreement rates for facility data to Network data for selected adult hemodialysis measures. The agreement rates for the pre- and post-dialysis BUNs[5] were acceptable (both at 94%). The agreement rates for the most recent date the patient returned to adult hemodialysis, the three epoetin dosages, pre- and post-dialysis weights, and IV iron dose ranged from low to just below acceptable (range was 24% to 79%).

Adult Peritoneal Dialysis CPMs

Matched data collection forms were available for 71 facility-abstracted and Network re-abstracted medical records.

Table 29 summarizes the comparison between facility-abstracted and Network re-abstracted categorical data for selected adult peritoneal

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[5] Approximately 93% of the data for this item were missing.

dialysis CPMs. Substantial to almost perfect agreement occurred for measures relating to adequacy of dialysis, anemia management and serum albumin (kappas ranging from 0.69 to.94).

Table 30 compares statistical means for continuous facility data and Network data for selected adult peritoneal dialysis CPMs. No statistically significant difference was found between the data abstracted by facility and Network staff for the adequacy of dialysis, anemia management, and serum albumin measures.

Tables 31 through 52 present the kappa statistic and the concurrence analysis for each of the tested measures. The kappa statistic for both data sets ranged from less than moderate to perfect agreement (ranging from 0.16 for prescribed route of EPO administration [Table 40]) to 0.95 for diabetes diagnosis. [Table 50]). Concurrence between the facility-abstracted data and the Network re-abstracted data on the presence of a particular value in the facility record ranged from less than acceptable (70% for method used to calculate the V in Kt/V_{urea}) (Table 32) to highly acceptable (97% for both serum albumin values [Table 41] and diabetes diagnosis [Table 50]).

Table 53 shows agreement rates for facility-abstracted data compared to Network re-abstracted data for selected adult peritoneal dialysis measures. The agreement rates for the IV iron dose, 24 hour dialysate urea nitrogen, 24 hour dialysate creatinine, 24 hour urine volume, 24 hour urine creatinine, 24 hour urine urea nitrogen, serum creatinine and serum BUN were acceptable (ranging from 83% to 93%), whereas the agreement rates for epoetin dose, adequacy assessment weight, weekly $Kt/V_{urea,}$ weekly creatinine clearance, and 24 hour dialysate volume were low to just below acceptable (ranging from 56% to 79%). The first clinic visit weight was way below acceptable at 35%.

Pediatric Hemodialysis CPMs

Matched data collection forms were available for 31 facility-abstracted and Network re-abstracted medical records.

Table 54 summarizes the comparison between facility and Network categorical data for selected pediatric hemodialysis indicators of care. Substantial to perfect agreement occurred for measures relating to adequacy of dialysis, anemia management, serum albumin values, and vascular access.

Table 55 shows the comparison of means for continuous facility and Network data for selected pediatric hemodialysis CPMs (excluding measures related to access). There was no statistical difference between the means of the facility-abstracted and Network re-abstracted pediatric hemodialysis measures.

Tables 56 through 77 provide the inter-rater reliability analyses for each of the tested measures, including those related to access. When the weekly $Kt/V_{urea} \geq 1.2$ was used as a cutoff threshold for adequacy of dialysis, the kappa was 0.65, indicating substantial agreement (Table 56). The data regarding the methods used to calculate the reported Kt/V also indicated substantial agreement (kappa 0.71) (Table 57). However, less than moderate agreement was found between facility-abstracted data and Network re-abstracted data regarding whether or not residual urine function was used to calculate Kt/V (kappa 0.30) (Table 58). The kappa statistic indicated substantial or almost perfect agreement for all anemia management and serum albumin measures.

Concurrence regarding the types of access used was almost perfect at 90% (Tables 67) for type of access used at the last hemodialysis session on or between October 1, 2003 and December 31, 2003 at 84% for both type of access used at initiation and used 90 days after initiation date (Tables 72 and 73). Their kappa statistics are substantial to almost perfect (ranging from 0.69-0.86). The kappa statistic for reason for catheter (Table 68) and catheter or port access duration (Table 69) are almost perfect, at 0.80 and 0.87,

respectively. Presence of routine stenosis monitoring at 0.68 (Table 70) reflects substantial agreement between abstractors. The kappa statistic for the different types of stenosis monitoring methods (Tables 71a–71e) is all of perfect agreement at kappa of 1.00.

Level of concurrence regarding limb amputation, number of prescribed hemodialysis treatments per week, ethnicity, and diagnosis of diabetes (Tables 74, 75, 76 and 77) were high (ranged 84% to 97%), with the kappa statistics moderate to substantial at 0.58 to 0.78.

Table 78 provides agreement rates for facility data to Network data for nine (9) selected pediatric hemodialysis measures. The agreement rates for the pre-dialysis and post-dialysis BUNs and all three EPO doses were acceptable (ranging from 84% to 94%), but the agreement rates for the most recent date the patient returned to pediatric hemodialysis, pre- and post-dialysis weights, and IV iron administration dose were relatively low (ranging from 61% to 71%).

Reliability From Year To Year

From 2003 to 2004, the inter-rater reliability for 10 items improved significantly over last year's results. An item's kappa statistic was considered to have improved significantly this year if it had a ≥ 0.1 increase from 2003 to 2004 and a shift upward in its categorical agreement rating (See Project Methods, Kappa Statistics). The table to the right lists the items that improved from 2003 to 2004, as well as their associated kappa statistic and level of concurrence (LOC) for the corresponding year.

	Kappa		LOC	
	2003	**2004**	**2003**	**2004**
Adult Hemodialysis Items				
Catheter duration ≥ 90 days, if used for access between Oct. 1 and Dec. 31	0.58	0.72	78%	81%
Adult Peritoneal Dialysis Items				
Creatinine clearance corrected by body surface area	0.39	0.73	96%	90%
Hemoglobin ≥ 9 gm/dL	0.38	0.69	96%	94%
Epoetin dose prescription	0.67	0.81	88%	93%
Laboratory method used to measure serum albumin	0.58	0.84	94%	96%
Pediatric Hemodialysis Items				
Reason for catheter, if used for access between Oct. 1 and Dec. 31	0.69	0.80	79%	87%
Catheter duration ≥ 90 days, if used for access between Oct. 1 and Dec. 31	0.50	0.87	67%	94%
Static Venous Pressure Method	0.48	1.00	94%	100%
Dynamic Venous Pressure Method	0.72	1.00	94%	100%
Other method of routine vascular access monitoring	0.65	1.00	97%	100%

The inter-rater reliability for a few hemodialysis and adult peritoneal dialysis items declined from last year's results. An item's kappa statistic was considered to have declined significantly this year if it had a ≥ 0.1 decline from 2003 to 2004 and a downward shift its categorical agreement rating (See Project Methods, Kappa Statistics). The table below lists the 13 items that declined from 2003 to 2004, as well as their associated kappa statistic and level of concurrence for the corresponding years.

	Kappa		LOC	
	2003	2004	2003	2004
Adult Hemodialysis Items				
Presence of routine monitoring for stenosis, when synthetic grafts, bovine grafts, or AV fistulas, were used for access between Oct. 1 and Dec. 31	0.68	0.58	80%	71%
Other method of routine monitoring of vascular access	0.50	0.36	92%	91%
Adult Peritoneal Dialysis Items				
Method used to calculate the V in Kt/V	0.79	0.57	85%	70%
Weekly creatinine clearance	0.97	0.79	99%	89%
Prescribed route of EPO administration	0.62	0.16	84%	87%
Total number of dialysis exchanges during the nighttime for cycler patients	0.92	0.29	94%	85%
Medication use for diabetes control	0.78	0.52	96%	89%
Pediatric Hemodialysis Items				
Residual urine function used to calculate Kt/V	0.52	0.30	73%	55%
The type of access used at the initiation (re-initiation) of the first time hemodialysis, if between Jan.1 and Aug.31	0.82	0.69	94%	84%
The type of access used 90 days after the date in Table 18 during the initiation (re-initiation) of hemodialysis, if between Jan.1 and Aug.31	0.83	0.70	94%	84%
Limb amputation	1.00	0.65	100%	97%
Number of prescribed hemodialysis times per week	0.88	0.78	97%	97%
Diabetes diagnosis	1.00	0.58	100%	94%

Conclusions

Overall, a high rate of agreement existed between data abstraction conducted by dialysis facility staff and re-abstraction of records by Network staff. Among the adult hemodialysis, adult peritoneal dialysis, and pediatric hemodialysis cohorts, users can have confidence that the quality of the 2004 ESRD CPM data related to dialysis adequacy, anemia management, and serum albumin is not adversely influenced by the fact that the data are self-reported by dialysis facilities.

Several factors may account for the low inter-rater reliability found for some items. Such possibilities include lack of clear instructions, failure of abstractors to follow instructions, inaccurate completion of the data collection forms, and statistical issues related to sample size and unbalanced marginal totals (i.e., measures related to rare events).

One limitation of this study is the relatively small number of cases that could be re-abstracted with available resources. It is also important to note that this study examined inter-rater reliability rather than validity. For instance, if a record entry listed the pre-dialysis weight of a patient to be 75 kgs., both the facility abstractor and Network re-abstractor might have agreed on the pre-dialysis weight of the patient, yet the scale that was used to weigh the patient may have been inaccurate and in need of re-calibration. A more comprehensive validation study would require access to operative reports or other data sources that were not available for this study. However, there is no reason to believe that most routinely collected laboratory data are not accurately reflected in dialysis patient records.

TABLE 1: Calculation of data concurrence

Network Re-Abstracted Data

	Missing	–	+	Total
Missing	**a**	b	c	a + b + c
–	d	**e**	f	d + e + f
+	g	h	**i**	g + h + i
Total	a + d + g	b + e + h	c + f + i	**Total**

Facility Abstracted Data

Level of concurrence = $\frac{a + e + i}{Total} \times 100$

NOTE: Cells a, e, and i represent concurrence—instances when both Network and facility staff reported the same value for a particular item. On the other hand, cells b, c, d, f, g, and h represent cases where there was not concurrence between the two sources of data on a value for a particular item.

ADULT HEMODIALYSIS

TABLE 2: Comparison of categorical data abstracted by dialysis facility staff to categorical data re-abstracted by ESRD Network staff for selected adult hemodialysis measures

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	Kappa
ADEQUACY OF DIALYSIS			
Weekly Kt/V			
Kt/V ≥1.2	93%	93%	0.73
Prescribed Dialysis Times Per Week			
Prescribed dialysis < 3 times per week	2%	2%	0.84
ANEMIA MANAGEMENT			
Hemoglobin			
Hemoglobin ≥ 9 gm/dL	98%	97%	0.90
Hemoglobin ≥ 11 gm/dL	76%	76%	0.92
Serum Ferritin Concentration			
Serum ferritin concentration ≥ 100 ng/mL	92%	90%	0.92
Transferrin Saturation			
Transferrin saturation ≥ 20%	74%	75%	0.93
SERUM ALBUMIN			
Serum albumin (≥ 3.5 gm/dL [BCG] or ≥ 3.2 gm/dL [BCP])	79%	79%	0.92
VASCULAR ACCESS			
Type of access used on last adult hemodialysis session on or between October 1, 2002, and December 31, 2002			
AV Fistula	35%	33%	0.86
AVG Synthetic	36%	36%	0.86
AVG Bovine	1%	<1%	0.86
Catheter	27%	29%	0.86
Port Access	<1%	<1%	0.86

BCG = bromcresol green
BCP = bromcresol purple
The number of matched facility and Network data collection forms was 429.

ADULT HEMODIALYSIS

TABLE 3: Comparison of means for continuous data abstracted by dialysis facility staff to continuous data re-abstracted by ESRD Network staff for selected adult hemodialysis measures (excluding measures related to vascular access)

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	p-value
ADEQUACY OF DIALYSIS			
Recorded Kt/V			
Mean	1.58 (n=336)	1.58 (n=320)	0.04
Minimum – Maximum	0.60 – 3.20	0.60 – 3.20	
Pre-Dialysis BUN (mg/dL)			
Mean	56.32 (n=394)	55.86 (n=384)	0.82
Minimum – Maximum	12.00 – 128.00	12.00 – 128.00	
Post-Dialysis BUN (mg/dL)			
Mean	15.71 (n=392)	15.74 (n=388)	0.83
Minimum – Maximum	2.00 – 49.00	1.00 – 49.00	
Pre-Dialysis Weights (lbs/kgs)			
Mean	91.74 (n=385)	85.30 (n=384)	<0.0001
Minimum – Maximum	37.60 – 279.50	37.60 – 230.30	
Post-Dialysis Weights (lbs/kgs)			
Mean	88.84 (n=379)	82.24 (n=369)	<0.0001
Minimum – Maximum	38.70 – 273.10	32.40 – 221.40	
Scheduled Dialysis Times Per Week			
Mean	2.99 (n=397)	3.00 (n=397)	0.20
Minimum – Maximum	2.00 – 4.00	1.00 – 6.00	
ANEMIA MANAGEMENT			
Hemoglobin (gm/dL)			
Mean	11.87 (n=398)	11.85 (n=395)	0.68
Minimum – Maximum	7.30 – 35.10	7.30 – 16.60	
Serum Ferritin Concentration (ng/mL)			
Mean	578.35 (n=203)	589.92 (n=192)	0.31
Minimum – Maximum	24.00 – 2,342.00	24.00 – 2,342.00	
Transferrin Saturation (%)			
Mean	28.24 (n=328)	28.50 (n=321)	0.49
Minimum – Maximum	0.00 – 88.00	8.00 – 99.00	
Epoetin Dose (units per treatment)			
Mean	7,162.25 (n=369)	6,960.83 (n=362)	0.10
Minimum – Maximum	0 – 62,500.00	0 – 62,500.00	

ADULT HEMODIALYSIS

TABLE 3: (Continued)

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	p-value
ANEMIA MANAGEMENT (cont).			
Epoetin Dose (units per treatment) (cont.)			
Mean	7,147.29 (n=362)	6,860.68 (n=353)	0.04
Minimum – Maximum	0 – 62,500.00	0 – 62,500.00	
Mean	7,098.38 (n=358)	6,905.13 (n=355)	0.15
Minimum – Maximum	0 – 62,500.00	0 – 62,500.00	
IV Iron Dose			
Mean	301.31 (n=197)	292.90 (n=195)	0.42
Minimum – Maximum	0 – 1,800.00	0 – 1,200.00	
SERUM ALBUMIN (gm/dL)			
Serum albumin by BCG method			
Mean	3.82 (n=366)	3.81 (n=380)	0.86
Minimum – Maximum	2.20 – 5.10	2.20 – 5.10	
Serum albumin by BCP method			
Mean	3.41 (n=27)	3.36 (n=13)	0.34
Minimum – Maximum	2.20 – 4.50	2.80 – 4.30	

BCG = bromcresol green
BCP = bromcresol purple
n = number of non-missing records in the sample; hence, the "n" may not be equal between the two samples

ADULT HEMODIALYSIS: Adequacy of Dialysis

TABLE 4: Recorded weekly single-pooled Kt/V [Question 20C]

Network Re-Abstracted Data

	Missing	**< 1.2**	**≥ 1.2**	**Total**
Missing	**74**	0	8	82
< 1.2	3	**17**	3	23
≥ 1.2	30	5	**289**	324
Total	107	22	300	**429**

Facility Abstracted Data (left axis label)

Kappa = 0.73

Level of concurrence = $\frac{74 = 17 + 289}{429}$ = 89%

TABLE 5: Method used to calculate the recorded weekly single-pooled Kt/V [Question 20D]

Network Re-Abstracted Data

	Missing	**UKM**	**Daugirdas II**	**Equilibrated**	**Derived from URR**	**Other/ Unknown**	**Total**
Missing	**80**	6	2	0	1	2	91
UKM	14	**85**	7	0	2	16	124
Daugirdas II	15	11	**99**	1	1	6	133
Equilibrated	1	0	2	**14**	0	0	17
Derived from URR	2	4	1	1	**22**	7	37
Other/ Unknown	1	5	1	1	1	**18**	27
Total	113	111	112	17	27	49	**429**

Facility Abstracted Data (left axis label)

Kappa = 0.67

Level of concurrence = $\frac{80 + 85 + 99 + 14 + 22 + 18}{429}$ = 74%

ADULT HEMODIALYSIS: Adequacy of Dialysis

TABLE 6: Residual urine function used to calculate weekly Kt/V
[Question 20E]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	Yes	No	Unknown	Total
	Missing	**85**	1	4	3	93
	Yes	**2**	**13**	8	9	32
	No	26	4	**209**	43	282
	Unknown	1	0	9	**12**	22
	Total	114	18	230	67	**429**

Kappa = 0.56

Level of concurrence = $\frac{85 + 13 + 209 + 12}{429}$ = 74%

ADULT HEMODIALYSIS: Anemia Management

TABLE 7: Hemoglobin ≥ 9gm/dL [Question 18A]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	< 9 gm/dL	≥ 9 gm/dL	Total
	Missing	**26**	0	1	27
	< 9 gm/dL	0	**9**	0	9
	≥ 9 gm/dL	5	1	**387**	393
	Total	31	10	388	**429**

Kappa = 0.90

Level of concurrence = $\frac{26 + 9 + 387}{429}$ = 98%

TABLE 8: Hemoglobin ≥ 11gm/dL
[Question 18A]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	< 11 gm/dL	≥ 11 gm/dL	Total
	Missing	**30**	0	1	31
	< 11 gm/dL	1	**89**	7	97
	≥ 11 gm/dL	3	4	**294**	301
	Total	34	93	302	**429**

Kappa = 0.92

Level of concurrence = $\frac{30 + 89 + 294}{429}$ = 96%

ADULT HEMODIALYSIS: Anemia Management

TABLE 9: Serum ferritin concentration ≥ 100 mg/dL [Question 18C]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	< 100 ng/dL	≥ 100 ng/dL	Total
Missing	**209**	2	6	217
< 100 ng/dL	1	**17**	0	18
≥ 100 ng/dL	9	1	**184**	194
Total	219	20	190	**429**

Kappa = 0.92.
Level of concurrence = $\frac{209 + 17 + 184}{429}$ = 96%

TABLE 10: Percent transferrin saturation ≥ 20% [Question 18D]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	< 20%	≥ 20%	Total
Missing	**109**	1	4	114
< 20%	5	**76**	0	81
≥ 20%	8	1	**225**	234
Total	122	78	229	**429**

Kappa = 0.93
Level of concurrence = $\frac{109 + 76 + 225}{429}$ = 96%

TABLE 11: Epoetin prescription [Question 18B1a]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	Yes	No	Unk	Total
Missing	**26**	1	1	0	28
Yes	5	**347**	6	4	362
No	2	9	**25**	2	38
Unk	0	0	1	**0**	1
Total	33	357	33	6	**429**

Kappa = 0.75
Level of concurrence = $\frac{26 + 347 + 25}{429}$ = 93 %

Unk=unknown

TABLE 12: Prescribed route of epoetin administration [Question 18B4a]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	IV	SC	Unk	Total
Missing	**49**	10	0	0	59
IV	14	**328**	2	2	346
SC	1	2	**19**	1	23
Both	0	1	0	0	1
Total	64	341	21	**3**	**429**

Kappa = 0.77
Level of concurrence = $\frac{49 + 328 + 19}{429}$ = 92 %

Unk=unknown
IV = intravenous
SC = subcutaneous

ADULT HEMODIALYSIS: Serum Albumin

TABLE 13: Serum albumin values (≥ 3.5/3.2 gm/dL by BCG/BCP methods)
[Question 19A and 19B]

Network Re-Abstracted Data

	Missing	< 3.5/3.2 gm/dL	≥ 3.5/3.2 gm/dL	Total
Missing	27	1	2	30
< 3.5/3.2 gm/dL	2	78	4	84
≥ 3.5/3.2 gm/dL	3	3	309	315
Total	32	82	315	429

Facility Abstracted Data

Kappa = 0.92
Level of concurrence = $\frac{27 + 78 + 309}{429}$ = 97%

BCG = bromcresol green
BCP = bromcresol purple

TABLE 14: Laboratory method used to measure serum albumin in Table 13
[Question 19B]

Network Re-Abstracted Data

	Missing	BCG	BCP	Total
Missing	28	0	1	29
BCG	5	364	4	373
BCP	0	17	10	27
Total	33	381	15	429

Facility Abstracted Data

Kappa = 0.71
Level of concurrence = $\frac{28 + 364 + 10}{429}$ = 94%

BCG = bromcresol green
BCP = bromcresol purple

ADULT HEMODIALYSIS: Vascular Access

TABLE 15: The type of access used on the last adult hemodialysis session on or between October 1, 2003 and December 31, 2003 [Question 21]

Network Re-Abstracted Data

	Missing	AV Fistula	Synthetic Graft	Bovine Graft	Catheter	Port Access	Unknown	Total
Missing	**4**	2	0	0	1	0	1	8
AV Fistula	0	**134**	4	0	8	0	0	146
Synthetic Graft	0	5	**141**	0	7	0	0	153
Bovine Graft	0	0	3	**2**	0	0	0	5
Catheter	0	1	7	1	**103**	0	0	112
Port Access	0	0	0	0	1	**3**	0	4
Unknown	0	0	0	0	1	0	**0**	1
Total	4	142	155	3	121	3	1	**429**

Facility Abstracted Data (row axis label)

Kappa = 0.86

Level of concurrence = $\dfrac{4 + 134 + 141 + 2 + 103 + 3}{429}$ = 90%

ADULT HEMODIALYSIS: Vascular Access

TABLE 16: Reason for catheter or port access, if used for access between October 1, 2003 and December 31, 2003 [Question 21C1]

Network Re-Abstracted Data

	Missing	Fistula or graft maturing, not ready to cannulate	Temporary interruption of fistula or graft due to clotting or revisions	All fistula or graft sites have been exhausted	No fistula or graft surgically created at this time	No fistula or graft surgically planned	Other	Total
Missing	296	5	5	1	4	2	1	314
Fistula or graft maturing, not ready to cannulate	7	18	2	0	0	1	0	28
Temporary interruption of fistula or graft due to clotting or revisions	2	0	3	0	0	0	0	5
All fistula or graft sites have been exhausted	0	0	0	16	2	0	2	20
No fistula or graft surgically created at this time	0	0	0	2	20	7	2	31
No fistula or graft surgically planned	0	2	0	2	2	16	2	24
Other	0	1	1	0	0	3	2	7
Total	305	26	11	21	28	29	9	429

Facility Abstracted Data

Kappa = 0.71

Level of concurrence = $\frac{296 + 18 + 3 + 16 + 20 + 16 + 2}{429}$ = 86%

ADULT HEMODIALYSIS: Vascular Access

TABLE 17: Catheter or port access used exclusively as access ≥90 days between October 1, 2003 and December 31, 2003 [Question 21C2]

Network Re-Abstracted Data

	Missing	Yes	No	Unknown	Total
Missing	296	9	7	1	313
Yes	2	69	7	9	87
No	6	5	10	0	21
Unknown	1	4	2	1	8
Total	305	87	26	11	429

Facility Abstracted Data

Kappa = 0.72

Level of concurrence = $\dfrac{269 + 69 + 10 + 1}{429}$ = 81%

TABLE 18: The presence of routine monitoring for stenosis when synthetic grafts, bovine grafts, or AV fistulae were used for access between October 1, 2003 and December 31, 2003 [Question 21B1]

Network Re-Abstracted Data

	Missing	Yes	No	Unknown	Total
Missing	114	6	3	3	126
Yes	10	142	32	32	216
No	4	14	40	9	67
Unknown	1	4	6	9	20
Total	129	166	81	53	429

Facility Abstracted Data

Kappa = 0.58

Level of concurrence = $\dfrac{114 + 142 + 40 + 9}{429}$ = 71 %

ADULT HEMODIALYSIS: Vascular Access

TABLE 19a-e: The routine stenosis monitoring method used between October 1, 2003 and December 31, 2003 when synthetic grafts, bovine grafts, or AV fistulae were used for access [Question 21B2]

19a: Color-Flow Doppler Method

Network Re-Abstracted Data

Facility Abstracted Data		No	Yes	Total
	No	**422**	2	424
	Yes	3	**2**	5
	Total	425	4	**429**

Kappa = 0.44
Level of concurrence = $\frac{422 + 2}{429}$ = 99 %

19b: Static Venous Pressure Method

Network Re-Abstracted Data

Facility Abstracted Data		No	Yes	Total
	No	**417**	3	420
	Yes	4	**5**	9
	Total	421	8	**429**

Kappa = 0.58
Level of concurrence = $\frac{417 + 5}{429}$ = 98 %

19c: Dynamic Venous Pressure Method

Network Re-Abstracted Data

Facility Abstracted Data		No	Yes	Total
	No	**231**	29	260
	Yes	71	**98**	169
	Total	302	127	**429**

Kappa = 0.49
Level of concurrence = $\frac{231 + 98}{429}$ = 77 %

19d: Dilution Technique

Network Re-Abstracted Data

Facility Abstracted Data		No	Yes	Total
	No	**415**	2	417
	Yes	8	**4**	12
	Total	423	6	**429**

Kappa = 0.43
Level of concurrence = $\frac{415 + 4}{429}$ = 98 %

19e: Other Method

Network Re-Abstracted Data

Facility Abstracted Data		No	Yes	Total
	No	**378**	18	396
	Yes	20	**13**	33
	Total	398	31	**429**

Kappa = 0.36
Level of concurrence = $\frac{378 + 13}{429}$ = 91 %

ADULT HEMODIALYSIS: Vascular Access

TABLE 20: The type of access used at the initiation of a maintenance course of adult hemodialysis, if between January 1, 2003 and August 31, 2003 [Question 22A]

Network Re-Abstracted Data

	Missing	AV Fistula	Synthetic Graft	Catheter	Unknown	Total
Missing	359	0	1	7	0	367
AV Fistula	1	7	0	0	1	9
Synthetic Graft	1	0	2	0	1	4
Bovine Graft	0	0	0	0	1	1
Catheter	5	0	1	38	2	46
Port Access	1	0	0	0	0	1
Unknown	0	0	0	1	0	1
Total	367	7	4	46	5	429

Facility Abstracted Data

Kappa = 0.79

Level of concurrence = $\dfrac{359 + 7 + 2 + 38}{429}$ = 95 %

TABLE 21: The type of access used 90 days after the date in Table 20 during the initiation of adult hemodialysis, if between January 1, 2003 and August 31, 2003 [Question 22B]

Network Re-Abstracted Data

	Missing	AV Fistula	Synthetic Graft	Catheter	Unknown	Total
Missing	**359**	1	1	6	0	367
AV Fistula	2	**10**	0	1	4	17
Synthetic Graft	2	0	**8**	0	1	11
Bovine graft	0	0	1	0	0	1
Catheter	3	0	0	**28**	0	31
Port Access	1	0	0	0	0	1
Unknown	0	0	0	1	**0**	1
Total	367	11	10	36	5	**429**

Facility Abstracted Data (vertical axis label)

Kappa = 0.79

Level of concurrence = $\dfrac{359 + 10 + 8 + 28}{429}$ = 94 %

ADULT HEMODIALYSIS: Other Measures

TABLE 22: Limb amputation(s) prior to December 31, 2003 [Question 15]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	Yes	No	Unknown	Total
Missing	**3**	0	4	1	8
Yes	0	**28**	4	0	32
No	1	7	**368**	13	389
Total	4	35	376	14	**429**

Kappa = 0.65

Level of concurrence = $\frac{3 + 28 + 368}{429}$ = 93 %

TABLE 23: Number of prescribed adult hemodialysis times per week [Question 20A]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	1	2	3	4	6	Total
Missing	**30**	0	0	4	0	0	34
2	0	1	**5**	1	0	0	7
3	6	0	0	**377**	1	2	386
4	0	0	0	1	**1**	0	2
Total	36	1	5	383	2	2	**429**

Kappa = 0.80

Level of concurrence = $\frac{30 + 5 + 377 + 1}{429}$ = 96 %

ADULT HEMODIALYSIS: Other Measures

TABLE 24: Ethnicity [Question 13]

Network Re-Abstracted Data

	Missing	Non-Hispanic	Hispanic, Mexican American	Hispanic, Puerto Rican	Hispanic, other	Unknown	Total
Missing	**3**	7	1	0	0	1	12
Non-Hispanic	1	**355**	2	0	1	1	360
Hispanic, Mexican American	0	3	**32**	0	3	0	38
Hispanic, Puerto Rican	0	0	1	**4**	2	0	7
Hispanic, Cuban American	0	0	0	0	4	0	4
Hispanic, other	0	0	4	2	**2**	0	8
Total	4	365	40	6	12	2	**429**

Facility Abstracted Data

Kappa = 0.74

Level of concurrence = $\frac{3 + 355 + 32 + 4 + 2}{429}$ = 92 %

ADULT HEMODIALYSIS: Other Measures

TABLE 25: Diabetes diagnosis [Question 16]

Network Re-Abstracted Data

<table>
<tr><td></td><td>Missing</td><td>Yes</td><td>No</td><td>Unknown</td><td>Total</td></tr>
<tr><td>Missing</td><td>4</td><td>2</td><td>0</td><td>0</td><td>6</td></tr>
<tr><td>Yes</td><td>0</td><td>228</td><td>10</td><td>1</td><td>239</td></tr>
<tr><td>No</td><td>0</td><td>70</td><td>173</td><td>2</td><td>182</td></tr>
<tr><td>Unknown</td><td>0</td><td>0</td><td>2</td><td>0</td><td>2</td></tr>
<tr><td>Total</td><td>4</td><td>237</td><td>185</td><td>3</td><td>429</td></tr>
</table>

(Facility Abstracted Data — row axis)

Kappa = 0.89

Level of concurrence = $\dfrac{4 + 228 + 173}{429}$ = 94%

TABLE 26: Medication use for diabetes control [Question 17]

Network Re-Abstracted Data

<table>
<tr><td></td><td>Yes</td><td>No</td><td>Unk</td><td>Total</td></tr>
<tr><td>Yes</td><td>135</td><td>7</td><td>4</td><td>146</td></tr>
<tr><td>No</td><td>9</td><td>37</td><td>12</td><td>24</td></tr>
<tr><td>Unk</td><td>9</td><td>6</td><td>9</td><td>24</td></tr>
<tr><td>Total</td><td>153</td><td>50</td><td>25</td><td>228</td></tr>
</table>

(Facility Abstracted Data — row axis)

Kappa = 0.59

Level of concurrence = $\dfrac{135 + 37 + 9}{228}$ = 79 %

Unk= unknown

TABLE 27: Insulin use for diabetes [Question 17]

Network Re-Abstracted Data

<table>
<tr><td></td><td>Yes</td><td>No</td><td>Unk</td><td>Total</td></tr>
<tr><td>Yes</td><td>93</td><td>4</td><td>0</td><td>97</td></tr>
<tr><td>No</td><td>7</td><td>21</td><td>1</td><td>29</td></tr>
<tr><td>Unk</td><td>5</td><td>4</td><td>0</td><td>9</td></tr>
<tr><td>Total</td><td>105</td><td>29</td><td>1</td><td>135</td></tr>
</table>

(Facility Abstracted Data — row axis)

Kappa = 0.61

Level of concurrence = $\dfrac{93 + 21}{135}$ = 84 %

Unk= unknown

ADULT HEMODIALYSIS

Table 28: Agreement rate of data abstracted by dialysis facility staff to data re-abstracted by ESRD Network staff for selected adult hemodialysis measures

Measure	Agreement rate	Number of cases agreed upon	Total number of cases
Most recent date patient returned to adult hemodialysis [Question 11]	24%	7	29^
Epoetin dose #1 [Question 18B2]	79%	341	429
Epoetin dose #2 [Question 18B2]	76%	325	429
Epoetin dose #3 [Question 18B2]	75%	322	429
IV iron administration dose [Question 18G]	77%	329	429
Pre-dialysis BUN [Question 20F]	94%	403	429
Post-dialysis BUN [Question 20G]	94%	402	429
Pre-dialysis weight [Question 20H]	75%	321	429
Post-dialysis weight [Question 20H]	76%	325	429

^ Approximately 93% of the data for this item were missing from facility or/and Network abstacted data.

ADULT PERITONEAL DIALYSIS

TABLE 29: Comparison of categorical data abstracted by dialysis facility staff to categorical data re-abstracted by ESRD Network staff for selected adult peritoneal dialysis measures

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	Kappa
ADEQUACY OF DIALYSIS			
Weekly Kt/V$_{urea}$			
Kt/V$_{urea}$ ≥ 2.0	74%	72%	0.84
Weekly Creatinine Clearance (L/wk)			
Creatinine clearance ≥ 60	74%	65%	0.79
ANEMIA MANAGEMENT			
Hemoglobin			
Hemoglobin ≥ 9 gm/dL	94%	97%	0.69
Hemoglobin ≥ 11 gm/dL	71%	79%	0.90
Serum Ferritin Concentration			
Serum ferritin concentration ≥ 100 ng/mL	80%	85%	0.77
Transferrin Saturation			
Transferrin saturation ≥ 20%	90%	86%	0.91
SERUM ALBUMIN			
Serum albumin (≥ 3.2 gm/dL BCP/ ≥ 3.5 gm/dL BCG)	63%	65%	0.94

BCG = bromcresol green
BCP = bromcresol purple
The number of matched facility and Network data collection forms was 71.

ADULT PERITONEAL DIALYSIS

TABLE 30: Comparison of means for continuous data abstracted by dialysis facility staff to continuous data re-abstracted by ESRD Network staff for selected adult peritoneal dialysis measures

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	p-value
ADEQUACY OF DIALYSIS			
Total weekly Kt/V$_{urea}$			
Mean	2.45 (n=61)	2.39 (n=64)	0.12
Minimum – Maximum	1.49 – 3.97	1.30 – 3.97	
Total weekly Creatinine Clearance (L/wk)			
Mean	78.79 (n=61)	75.98 (n=64)	0.37
Minimum – Maximum	39.60 – 200.00	8.60 – 226.00	
ANEMIA MANAGEMENT			
Hemoglobin (gm/dL)			
Mean	11.77 (n=66)	11.80 (n=67)	0.76
Minimum – Maximum	7.00 – 14.40	7.10 – 14.30	
Serum Ferritin Concentration (ng/mL)			
Mean	529.54 (n=46)	537.56 (n=43)	0.32
Minimum – Maximum	16.00 – 1,757.00	16.00 – 1,757.00	
Transferrin Saturation (%)			
Mean	33.09 (n=54)	32.980 (n=55)	0.92
Minimum – Maximum	16.00 – 82.00	12.00 – 82.00	
Epoetin Dose (units per week)			
Mean	42,866.67 (n=51)	38,889.00 (n=55)	0.53
Minimum – Maximum	2,000.00 – 227,500.00	1000.00 – 160,000.00	
IV Iron Dose			
Mean	245.00 (n=5)*	245.83 (n=6)*	0.21
Minimum – Maximum	100.00 – 500.00	100.00 – 500.00	
WEIGHTS (kgs)			
Clinic Weight			
Mean	76.29 (n=68)	77.79 (n=68)	0.13
Minimum – Maximum	39.00 – 124.94	37.80 – 124.00	
Adequacy Weight			
Mean	77.88 (n=62)	75.85 (n=64)	0.17
Minimum – Maximum	37.80 – 124.50	37.80 – 124.94	
SERUM ALBUMIN (gm/dL)			
Serum albumin by BCG method			
Mean	3.62 (n=61)	3.61 (n=62)	0.90
Minimum – Maximum	2.30 – 4.80	2.30 – 4.80	

*Note: The low number of iron Rx documented.
BCG = bromcresol green
BCP = bromcresol purple. This year we had few (2) records indicating BCP.
n = number of non-missing records in the sample; hence, the "n" may not be equal between the two samples

ADULT PERITONEAL DIALYSIS: Adequacy of Dialysis

TABLE 31: Total weekly Kt/V$_{urea}$ [Question 21D]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	< 2.0	≥ 2.0	Total
Missing	**7**	1	2	10
< 2.0	0	**15**	1	16
≥ 2.0	0	2	**43**	45
Total	7	18	46	**71**

Kappa = 0.84
Level of concurrence = $\frac{7 + 15 + 43}{71}$ = 92%

TABLE 32: Method by which V was calculated in the total weekly Kt/V$_{urea}$ [Question 21E]

Network Re-Abstracted Data

Facility Abstracted Data	Missing	% Body Weight	Hume	Watson	Other	Total
% Body Weight	0	**5**	1	0	2	8
Hume	0	0	**20**	0	5	25
Watson	1	3	2	**17**	2	25
Other	0	0	2	0	**1**	3
Total	1	8	25	17	10	**61***

Kappa = 0.57
Level of concurrence = $\frac{5 + 20 + 17 + 1}{61}$ = 70%

*Records with missing recorded Kt/V were excluded from this table.

ADULT PERITONEAL DIALYSIS: Adequacy of Dialysis

TABLE 33: Total weekly Creatinine Clearance
[Question 21F]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	< 60 L/wk	≥ 60 L/wk	Total
	Missing	**7**	2	1	10
	< 60 L/wk	0	**16**	0	16
	≥ 60 L/wk	0	5	**40**	45
	Total	7	23	41	**71**

Kappa = 0.79
Level of concurrence = $\frac{7 + 16 + 40}{71}$ = 89%

TABLE 34: Creatinine Clearance corrected for body surface area, using standard methods
[Question 21G]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	Yes	No	Unk	Total
	Missing	**7**	2	0	1	10
	Yes	0	**54**	0	2	56
	No	0	0	**3**	1	4
	Unk	0	0	1	**0**	1
	Total	7	56	4	4	**71**

Kappa = 0.73
Level of concurrence = $\frac{7 + 54 + 3}{71}$ = 90%

Unk = unknown

ADULT PERITONEAL DIALYSIS: Anemia Management

TABLE 35: Hemoglobin ≥ 9 gm/dL
[Question 18A]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	< 9 gm/dL	≥ 9 gm/dL	Total
	Missing	**4**	0	2	6
	< 9 gm/dL	0	**1**	1	2
	≥ 9 gm/dL	1	0	**62**	63
	Total	5	1	65	**71**

Kappa = 0.69
Level of concurrence = $\frac{4 + 1 + 62}{71}$ = 94%

TABLE 36: Hemoglobin ≥ 11 gm/dL
[Question 18A]

Network Re-Abstracted Data

Facility Abstracted Data		Missing	< 11 gm/dL	≥ 11 gm/dL	Total
	Missing	**4**	0	1	5
	< 11 gm/dL	0	**14**	2	16
	≥ 11 gm/dL	0	0	**50**	50
	Total	4	14	53	**71**

Kappa = 0.90
Level of concurrence = $\frac{4 + 14 + 50}{71}$ = 96%

ADULT PERITONEAL DIALYSIS: Anemia Management

TABLE 37: Serum ferritin concentration
[Question 18C]

Network Re-Abstracted Data

	Missing	< 100 ng/mL	≥ 100 ng/mL	Total
Missing	21	0	1	22
< 100 ng/mL	1	4	1	6
≥ 100 ng/mL	6	0	37	43
Total	28	4	39	71

Facility Abstracted Data

Kappa = 0.77
Level of concurrence = $\frac{21 + 4 + 37}{71}$ = 87%

TABLE 38: Percent transferrin saturation
[Question 18D]

Network Re-Abstracted Data

	Missing	< 20%	≥ 20%	Total
Missing	14	0	1	15
< 20%	1	6	0	7
≥ 20%	1	0	48	49
Total	16	6	49	71

Facility Abstracted Data

Kappa = 0.91
Level of concurrence = $\frac{14 + 6 + 48}{71}$ = 96%

TABLE 39: Epoetin prescription [Question 18B2a]

Network Re-Abstracted Data

	Missing	Yes	No	Total
Missing	4	1	0	5
Yes	0	52	0	52
No	0	4	10	14
Total	0	4	10	71

Facility Abstracted Data

Kappa = 0.81
Level of concurrence = $\frac{4 + 52 + 10}{71}$ =93%

TABLE 40: Prescribed route of epoetin administration [Question 18B4a]

Network Re-Abstracted Data

	Missing	IV	SC	Total
Missing	14	0	6	20
SC	1	1	48	50
Unk	0	0	1	1
Total	15	1	55	71

Facility Abstracted Data

Kappa = 0.16
Level of concurrence = $\frac{14 + 48}{71}$ = 87%

Unk = unknown
IV = intravenous
SC = subcutaneous

Note: The kappa value is significantly influenced by unbalanced marginal totals in that rare events will yield a low kappa even when agreement is high.

ADULT PERITONEAL DIALYSIS: Serum Albumin

TABLE 41: Serum albumin values (≥ 3.5/3.2 gm/dL by BCG/BCP methods) [Question 19A and 19B]

Network Re-Abstracted Data

	Missing	< 3.5/3.2 gm/dL	≥ 3.5/3.2 gm/dL	Total
Missing	4	0	0	4
< 3.5/3.2 gm/dL	0	20	0	20
≥ 3.5/3.2 gm/dL	0	2	45	47
Total	4	22	45	71

Facility Abstracted Data

Kappa = 0.94
Level of concurrence = $\frac{4 + 20 + 45}{71}$ = 97%

TABLE 42: Laboratory method used to measure serum albumin in Table 41 [Question 19B]

Network Re-Abstracted Data

	Missing	BCG	BCP	Total
Missing	8	1	1	10
BCG	0	59	0	59
BCP	0	1	1	2
Total	8	61	2	71

Facility Abstracted Data

Kappa = 0.84
Level of concurrence = $\frac{8 + 59 + 1}{71}$ = 96%

BCG = bromcresol green
BCP = bromcresol purple

ADULT PERITONEAL DIALYSIS: Prescription

TABLE 43: Number of adult CAPD peritoneal dialysis days per week [Question 22A1]

Network Re-Abstracted Data

	Missing	7	Total
Missing	48	2	50
7	1	20	21
Total	49	22	71

Facility Abstracted Data

Kappa = 0.90
Level of concurrence = $\frac{48 + 20}{71}$ = 96%

ADULT PERITONEAL DIALYSIS: Prescription

TABLE 44: Total number of dialysis exchanges per 24 hours for CAPD patients
[Question 22A3]

Network Re-Abstracted Data

	Missing	4	5	6	Total
Missing	48	1	1	0	50
4	1	11	0	0	12
5	0	1	7	0	8
6	0	0	0	1	1
Total	49	13	8	1	71

Kappa = 0.88

Level of concurrence = $\dfrac{48 + 11 + 7 + 1}{71}$ = 94%

TABLE 45: Total number of dialysis exchanges during the nighttime for cycler patients
[Question 22B4b]

Network Re-Abstracted Data

	Missing	3	4	5	6	8	Total
Missing	29	0	1	0	0	0	30
2	0	0	1	0	0	0	1
3	0	5	1	0	0	0	6
4	0	0	16	1	1	0	18
5	0	0	1	8	1	0	10
6	1	0	1	1	2	1	6
Total	30	5	21	10	4	1	71

Kappa = 0.29

Level of concurrence = $\dfrac{29 + 5 + 16 + 8 + 2}{71}$ = 85%

ADULT PERITONEAL DIALYSIS: Prescription

TABLE 46: Total number of dialysis exchanges during the daytime for cycler patients [Question 22B5b]

Network Re-Abstracted Data

		Missing	0	1	2	4	Total
	Missing	29	1	0	0	0	30
	0	0	1	0	0	0	1
Facility Abstracted Data	**1**	1	0	24	0	0	25
	2	0	0	4	10	0	14
	3	0	0	0	0	1	1
	Total	30	2	28	10	1	71

Kappa = 0.87
Level of concurrence = $\frac{29 + 1 + 24 + 10}{71}$ = 90%

TABLE 47: Prescription changed [Question 22C2]

Network Re-Abstracted Data

		Missing	Yes	No	Unknown	Total
	Missing	7	1	0	1	9
	Yes	0	10	5	1	16
Facility Abstracted Data	**No**	0	2	39	3	44
	Unknown	0	0	1	1	2
	Total	7	13	45	6	71

Kappa = 0.64
Level of concurrence = $\frac{7 + 10 + 39 + 1}{71}$ = 80%

ADULT PERITONEAL DIALYSIS: Other Measures

TABLE 48: Limb amputation(s) prior to March 31, 2004 [Question 15]

Network Re-Abstracted Data

	Missing	Yes	No	Unknown	Total
Missing	2	0	0	0	2
Yes	0	2	1	0	3
No	0	1	63	2	66
Total	2	3	64	2	71

(Facility Abstracted Data — row axis label)

Kappa = 0.65

Level of concurrence = $\frac{2 + 2 + 63}{71}$ = 94%

TABLE 49: Ethnicity [Question 13]

Network Re-Abstracted Data

	Missing	Non-Hispanic	Hispanic, Mexican American	Hispanic, Cuban American	Unknown	Total
Missing	2	0	0	0	0	2
Non-Hispanic	0	60	1	0	1	62
Hispanic, Mexican American	0	0	5	0	0	5
Hispanic, Puerto Rican	0	0	0	1	0	1
Unknown	0	1	0	0	0	1
Total	2	61	6	1	1	71

(Facility Abstracted Data — row axis label)

Kappa = 0.94

Level of concurrence = $\frac{2 + 60 + 5}{71}$ = 94%

ADULT PERITONEAL DIALYSIS: Other Measures

TABLE 50: Diabetes diagnosis [Question 16]

Network Re-Abstracted Data

	Missing	Yes	No	Total
Missing	**2**	0	0	2
Yes	0	**36**	0	36
No	0	2	**31**	33
Total	2	38	31	**71**

Kappa = 0.95
Level of concurrence = $\frac{2 + 36 + 31}{71}$ = 97%

TABLE 51: Medication use for diabetes control [Question 17]

Network Re-Abstracted Data

	Yes	No	Unk	Total
Yes	**30**	0	0	30
No	1	**1**	0	2
Unk	2	1	**1**	4
Total	33	2	1	**36**

Kappa = 0.52
Level of concurrence = $\frac{30 + 1 + 1}{36}$ = 89%

Unk=unknown

TABLE 52: Insulin use for diabetes [Question 17]

Network Re-Abstracted Data

	Yes	No	Unk	Total
Yes	**20**	0	0	20
No	3	**6**	1	10
Total	23	6	1	**30**

Kappa = 0.68
Level of concurrence = $\frac{20 + 6}{30}$ = 87%

ADULT PERITONEAL DIALYSIS

Table 53: Agreement rate of data abstracted by dialysis facility staff to data re-abstracted by ESRD Network staff for selected adult peritoneal dialysis measures

Measure	Agreement rate	Number of cases agreed upon	Total number of cases
First clinic visit weight [Question 14b]	35%	25	71
Epoetin dose [Question 18B2]	56%	40	71
IV iron administration dose [Question 18G]	93%	66	71
Adequacy assessment weight [Question 21C]	68%	48	71
Recorded Kt/V$_{urea}$ [Question 21D]	79%	56	71
Recorded creatinine clearance [Question 21F]	68%	48	71
24 hour dialysate volume [Question 21H]	75%	53	71
24 hour dialysate urea nitrogen [Question 21I]	86%	61	71
24 hour dialysate creatinine [Question 21J]	83%	59	71
24 hour urine volume [Question 21K]	92%	65	71
24 hour urine urea nitrogen [Question 21L]	87%	62	71
24 hour urine creatinine [Question 21M]	92%	65	71
Serum BUN [Question 21N]	89%	63	71
Serum creatinine [Question 21O]	89%	63	71

PEDIATRIC HEMODIALYSIS

TABLE 54: Comparison of categorical data abstracted by dialysis facility staff to categorical data re-abstracted by ESRD Network staff for selected pediatric hemodialysis measures

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	Kappa
ADEQUACY OF DIALYSIS			
Recorded single-pooled Kt/V			
Kt/V ≥1.2	89%	89%	0.65
Prescribed Dialysis Times Per Week			
Prescribed dialysis < 3 times per week	0%	0%	0.78
ANEMIA MANAGEMENT			
Hemoglobin			
Hemoglobin ≥ 9 gm/dL	93%	93%	0.89
Hemoglobin ≥ 11 gm/dL	66%	67%	0.94
Transferrin Saturation			
Transferrin saturation	74%	79%	0.84
Serum Ferritin Concentration			
Serum ferritin concentration	79%	78%	0.95
SERUM ALBUMIN			
Serum albumin (≥ 3.5 gm/dL [BCG] or ≥ 3.2 gm/dL [BCP])	89%	82%	0.83
VASCULAR ACCESS			
Type of access used on last pediatric hemodialysis session on or between October 1, 2003, and December 31, 2003			
AVF	31%	27%	0.86
AVG Synthetic	24%	23%	0.86
Catheter	45%	50%	0.86

BCG = bromcresol green
BCP = bromcresol purple
The number of matched facility and Network data collection forms was 31.

PEDIATRIC HEMODIALYSIS

TABLE 55: Comparison of means for continuous data abstracted by dialysis facility staff to continuous data re-abstracted by ESRD Network staff for selected pediatric hemodialysis measures (excluding measures related to vascular access)

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	p-value
ADEQUACY OF DIALYSIS			
Recorded Kt/V			
Mean	1.63 (n=19)	1.69 (n=19)	0.21
Minimum – Maximum	1.20 – 2.10	1.20 – 2.20	
Pre-Dialysis BUN (mg/dL)			
Mean	56.79 (n=29)	53.44 (n=29)	0.24
Minimum – Maximum	29.00 – 103.00	17.00 – 103.00	
Post-Dialysis BUN (mg/dL)			
Mean	15.66 (n=26)	14.61 (n=28)	0.33
Minimum – Maximum	5.00 – 30.00	5.00 – 30.00	
Pre-Dialysis Weights (lbs/kgs)			
Mean	57.61 (n=27)	56.60 (n=27)	0.81
Minimum – Maximum	11.90 – 127.40	11.70 – 127.40	
Post-Dialysis Weights (lbs/kgs)			
Mean	54.95 (n=28)	53.32 (n=29)	0.30
Minimum – Maximum	11.50 – 120.90	11.50 – 120.90	
Scheduled Dialysis Times Per Week			
Mean	3.07 (n=29)	3.07 (n=29)	1.00
Minimum – Maximum	3.00 – 4.00	3.00 – 4.00	
ANEMIA MANAGEMENT			
Hemoglobin (gm/dL)			
Mean	11.69 (n=29)	11.51 (n=28)	0.41
Minimum – Maximum	8.00 – 16.00	8.00 – 16.00	
Transferrin Saturation (%)			
Mean	28.89 (n=18)	30.06 (n=17)	0.33
Minimum – Maximum	15.00 – 59.00	15.00 – 59.00	
Serum Ferritin Concentration (ng/mL)			
Mean	378.17 (n=18)	338.88 (n=16)	0.33
Minimum – Maximum	76.00 – 1,152.00	76.00 – 1,152.00	
Epoetin Dose #1 (units per treatment)			
Mean	5,152.17 (n=23)	4,812.50 (n=24)	0.33
Minimum – Maximum	0 – 12,000.00	0 – 12,000.00	
#2			
Mean	4,977.27 (n=22)	4,437.50 (n=24)	0.33
Minimum – Maximum	0 – 12,000.00	0 – 12,000.00	

PEDIATRIC HEMODIALYSIS

TABLE 55 (Continued)

Clinical Indicators	Data Abstracted by Facility Staff	Data Re-Abstracted by ESRD Network Staff	p-value
ANEMIA MANAGEMENT (cont.)			
Epoetin Dose #3 (cont.)			
Mean	5,250.00 (n=22)	4,479.71 (n=24)	0.33
Minimum – Maximum	0 – 12,000.00	0 – 12,000.00	
IV Iron Dose			
Mean	426.67 (n=15)	427.18 (n=17)	0.55
Minimum – Maximum	50.00 – 1,250.00	50.00 – 1,250.00	
SERUM ALBUMIN (gm/dL)			
Serum albumin by BCP method			
Mean	3.83 (n=4)	4.10 (n=1)	N/A*
Minimum – Maximum	3.30 – 4.20	4.10 – 4.10	
Serum albumin by BCG method			
Mean	4.07 (n=25)	4.02 (n=28)	0.33
Minimum – Maximum	3.10 – 5.10	3.10 – 5.10	

BCG = bromcresol green
BCP = bromcresol purple
n = number of non-missing records in the sample; hence, the "n" may not be equal between the two samples
*there was only one case using BCP method to obtain value of serum albumin

PEDIATRIC HEMODIALYSIS: Adequacy of Dialysis

TABLE 56: Recorded single-pooled Kt/V [Question 20C]

Network Re-Abstracted Data

	Missing	< 1.2	≥ 1.2	Total
Missing	9	0	3	12
< 1.2	0	2	0	2
≥ 1.2	3	0	14	17
Total	12	2	17	31

Kappa = 0.65

Level of concurrence = $\frac{9 + 2 + 14}{31}$ = 81%

TABLE 57: Method used to calculate the recorded Kt/V [Question 20D]

Network Re-Abstracted Data

	Missing	UKM	Daugirdas II	Derived from URR	Other/ Unknown	Total
Missing	7	1	0	2	0	10
UKM	0	5	0	0	0	5
Daugirdas II	3	0	6	0	0	9
Derived from URR	0	0	0	3	0	3
Other/ Unknown	1	0	0	0	3	4
Total	11	6	6	5	3	31

Kappa = 0.71

Level of concurrence = $\frac{7 + 5 + 6 + 3 + 3}{31}$ = 77%

PEDIATRIC HEMODIALYSIS: Adequacy of Dialysis

TABLE 58: Residual urine function used to calculate Kt/V
[Question 20E]

Network Re-Abstracted Data

<table>
<tr><td rowspan="9" style="writing-mode: vertical-lr;">Facility Abstracted Data</td><td></td><td>**Missing**</td><td>**No**</td><td>**Unknown**</td><td>**Total**</td></tr>
<tr><td>**Missing**</td><td>**9**</td><td>0</td><td>2</td><td>11</td></tr>
<tr><td>**No**</td><td>4</td><td>**8**</td><td>6</td><td>18</td></tr>
<tr><td>**Unknown**</td><td>0</td><td>2</td><td>**0**</td><td>2</td></tr>
<tr><td>**Total**</td><td>13</td><td>10</td><td>8</td><td>**31**</td></tr>
</table>

Kappa = 0.30

Level of concurrence = $\frac{9 + 8}{31}$ = 55%

PEDIATRIC HEMODIALYSIS: Anemia Management

TABLE 59: Hemoglobin ≥ 9gm/dL
[Question 18A]

Network Re-Abstracted Data

<table>
<tr><td rowspan="5" style="writing-mode: vertical-lr;">Facility Abstracted Data</td><td></td><td>**Missing**</td><td>**< 9 gm/dL**</td><td>**≥ 9 gm/dL**</td><td>**Total**</td></tr>
<tr><td>**Missing**</td><td>**3**</td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>**< 9 gm/dL**</td><td>0</td><td>**2**</td><td>0</td><td>2</td></tr>
<tr><td>**≥ 9 gm/dL**</td><td>1</td><td>0</td><td>**25**</td><td>26</td></tr>
<tr><td>**Total**</td><td>4</td><td>2</td><td>25</td><td>**31**</td></tr>
</table>

Kappa = 0.89

Level of concurrence = $\frac{3 + 2 + 25}{31}$ = 97%

TABLE 60: Hemoglobin ≥ 11gm/dL
[Question 18A]

Network Re-Abstracted Data

<table>
<tr><td rowspan="5" style="writing-mode: vertical-lr;">Facility Abstracted Data</td><td></td><td>**Missing**</td><td>**< 11 gm/dL**</td><td>**≥ 11 gm/dL**</td><td>**Total**</td></tr>
<tr><td>**Missing**</td><td>**1**</td><td>0</td><td>1</td><td>2</td></tr>
<tr><td>**< 11 gm/dL**</td><td>0</td><td>**10**</td><td>0</td><td>10</td></tr>
<tr><td>**≥ 11 gm/dL**</td><td>0</td><td>0</td><td>**19**</td><td>19</td></tr>
<tr><td>**Total**</td><td>1</td><td>10</td><td>20</td><td>**31**</td></tr>
</table>

Kappa = 0.94

Level of concurrence = $\frac{1 + 10 + 19}{31}$ = 97%

PEDIATRIC HEMODIALYSIS: Anemia Management

TABLE 61: Serum ferritin concentration
[Question 18C]

Network Re-Abstracted Data

Facility Abstracted Data

	Missing	< 100 ng/dL	≥ 100 ng/dL	Total
Missing	12	4	14	31
< 100 ng/dL	0	4	0	4
≥ 100 ng/dL	1	0	14	15
Total	13	4	14	31

Kappa = 0.95
Level of concurrence = $\underline{12 + 4 + 14}$ = 97%
　　　　　　　　　　　31

TABLE 62: Percent transferrin saturation
[Question 18D]

Network Re-Abstracted Data

Facility Abstracted Data

	Missing	< 20%	≥ 20%	Total
Missing	11	0	1	12
< 20%	0	4	1	5
≥ 20%	1	0	13	14
Total	12	4	15	31

Kappa = 0.84
Level of concurrence = $\underline{11 + 4 + 13}$ = 90%
　　　　　　　　　　　31

TABLE 63: Epoetin prescription [Question 18B1a]

Network Re-Abstracted Data

Facility Abstracted Data

	Missing	Yes	No	Total
Missing	2	0	0	2
Yes	0	26	0	26
No	1	1	1	3
Total	3	27	1	31

Kappa = 0.75
Level of concurrence = $\underline{2 + 26 + 1}$ = 94%
　　　　　　　　　　　31

TABLE 64: Prescribed route of epoetin administration [Question 18B2a]

Network Re-Abstracted Data

Facility Abstracted Data

	Missing	IV	SC	Total
Missing	4	1	0	5
IV	1	24	0	25
SC	0	0	1	1
Total	5	25	1	31

Kappa = 0.80
Level of concurrence = $\underline{4 + 24 + 1}$ = 94%
　　　　　　　　　　　31

IV = intravenous
SC = subcutaneous

PEDIATRIC HEMODIALYSIS: Serum Albumin

TABLE 65: Serum albumin values (≥ 3.5/3.2 gm/dL by BCG/BCP methods)
[Question 19A and 19B]

Network Re-Abstracted Data

	Missing	**< 3.5/3.2 gm/dL**	**≥ 3.5/3.2 gm/dL**	**Total**
Missing	**3**	0	0	3
< 3.5/3.2 gm/dL	0	**3**	0	3
≥ 3.5/3.2 gm/dL	0	2	**23**	25
Total	3	5	23	**31**

Kappa = 0.83
Level of concurrence = $\frac{3 + 3 + 23}{31}$ = 94%

BCG = bromcresol green
BCP = bromcresol purple

TABLE 66: Laboratory method used to measure serum albumin in Table 65
[Question 19B]

Network Re-Abstracted Data

	Missing	**BCG**	**BCP**	**Total**
Missing	**3**	0	0	3
BCG	0	**24**	0	24
BCP	0	3	**1**	4
Total	3	27	1	**31**

Kappa = 0.69
Level of concurrence = $\frac{3 + 24 + 1}{31}$ = 90%

BCG = bromcresol green
BCP = bromcresol purple

PEDIATRIC HEMODIALYSIS: Vascular Access

TABLE 67: The type of access used on the last pediatric hemodialysis session on or between October 1, 2003 and December 31, 2003 [Question 21A]

Network Re-Abstracted Data

	Missing	AV Fistula	Synthetic Graft	Catheter	Total
Missing	1	1	0	0	2
AV Fistula	0	7	0	2	9
Synthetic Graft	0	0	7	0	7
Catheter	0	0	0	13	13
Total	1	8	7	15	31

(Row labels at left: Facility Abstracted Data)

Kappa = 0.86

Level of concurrence = $\dfrac{1 + 7 + 7 + 13}{31}$ = 90%

PEDIATRIC HEMODIALYSIS: Vascular Access

TABLE 68: Reason for catheter or port access, if used for access between October 1, 2003 and December 31, 2003 [Question 21C1]

Network Re-Abstracted Data

	Missing	AVF or graft maturing, not ready to cannulate	All AVF or graft sites have been exhausted	No AVF or graft surgically created at this time	No AVF or graft surgically planned	Other	Total
Missing	**16**	2	0	0	0	0	18
AVF or graft maturing, not ready to cannulate	0	**1**	0	0	0	0	1
All AVF or graft sites have been exhausted	0	0	**1**	0	0	0	1
No AVF or graft surgically created at this time	0	0	0	**3**	0	1	4
No fistula or graft surgically planned	0	0	0	1	**6**	0	7
Total	16	3	1	4	6	1	**31**

Kappa = 0.80

Level of concurrence = $\underline{16 + 1 + 1 + 3 + 6}$ = 87%
31

PEDIATRIC HEMODIALYSIS: Vascular Access

TABLE 69: Catheter or port access duration (≥90 days), if used for access between October 1, 2003 and December 31, 2003 [Question 21C2]

Network Re-Abstracted Data

	Missing	Yes	Total
Missing	16	2	18
Yes	0	13	13
Total	16	15	31

Kappa = 0.87
Level of concurrence = $\underline{16 + 13}$ = 94%
                       31

TABLE 70: The presence of routine monitoring for stenosis when synthetic grafts, bovine grafts, or AV fistulae were used for access between October 1, 2003 and December 31, 2003 [Question 21B1]

Network Re-Abstracted Data

	Missing	Yes	No	Unknown	Total
Missing	14	0	1	0	15
Yes	0	3	0	0	3
No	2	0	8	2	12
Unknown	0	0	1	0	1
Total	16	3	10	2	31

Kappa = 0.68
Level of concurrence = $\underline{14 + 3 + 8}$ = 81%
                       31

PEDIATRIC HEMODIALYSIS: Vascular Access

TABLE 71a-e: The routine stenosis monitoring method used between October 1, 2003 and December 31, 2003 when synthetic grafts, bovine grafts, or AV fistulae were used for access
[Question 21B2]

71a: Color-Flow Doppler Method

Network Re-Abstracted Data

	No	Total
No	**31**	31
Total	31	**31**

Kappa = 1.00
Level of concurrence = $\frac{31}{31}$ = 100%

71b: Static Venous Pressure Method

Network Re-Abstracted Data

	No	Yes	Total
No	**30**	0	30
Yes	0	**1**	1
Total	30	1	**31**

Kappa = 1.00
Level of concurrence = $\frac{30 + 1}{31}$ = 100%

71c: Dynamic Venous Pressure Method

Network Re-Abstracted Data

	No	Yes	Total
No	**29**	0	29
Yes	0	**2**	2
Total	29	2	**31**

Kappa = 1.00
Level of concurrence = $\frac{31}{31}$ = 100%

71d: Dilution Technique

Network Re-Abstracted Data

	No	Yes	Total
No	**30**	0	30
Yes	0	**1**	1
Total	30	1	**31**

Kappa = 1.00
Level of concurrence = $\frac{31}{31}$ = 100%

71e: Other Method

Network Re-Abstracted Data

	No	Total
No	**31**	0
Total	31	**31**

Kappa: 1.00
Level of concurrence = $\frac{31}{31}$ = 100%

PEDIATRIC HEMODIALYSIS: Vascular Access

TABLE 72: The type of access used at the initiation of a maintenance course of pediatric hemodialysis, if between January 1, 2003 and August 31, 2003 [Question 22A]

Network Re-Abstracted Data

	Missing	Catheter	Total
Missing	18	2	20
AV Fistula	0	2	2
Synthetic graft	0	1	1
Catheter	0	8	8
Total	18	13	31

Facility Abstracted Data (row axis label)

Kappa = 0.69

Level of concurrence = $\frac{18 + 8}{31}$ = 84%

TABLE 73: The type of access used 90 days after the date in Table 72 during the initiation of pediatric hemodialysis, if between January 1, 2003 and August 31, 2003 [Question 22B]

Network Re-Abstracted Data

	Missing/ Unknown	AV Fistula	Synthetic graft	Catheter	Total
Missing/ Unknown	18	0	0	2	20
AV Fistula	0	1	0	2	3
Synthetic graft	0	0	1	0	1
Catheter	0	1	0	6	7
Total	18	2	1	10	31

Facility Abstracted Data (row axis label)

Kappa = 0.70

Level of concurrence = $\frac{18 + 1 + 1 + 6}{31}$ = 84%

PEDIATRIC HEMODIALYSIS: Other Measures

TABLE 74: Limb amputation(s) prior to December 31, 2003 [Question 15]

Network Re-Abstracted Data

	Missing	No	Total
Missing	1	1	2
No	0	29	29
Total	1	30	31

Facility Abstracted Data

Kappa = 0.65

Level of concurrence = $\frac{1 + 29}{31}$ = 97%

TABLE 75: Number of prescribed pediatric hemodialysis times per week [Question 20A]

Network Re-Abstracted Data

	Missing	≥3	Total
Missing	2	1	3
≥3	0	28	28
Total	2	29	31

Facility Abstracted Data

Kappa = 0.78

Level of concurrence = $\frac{2 + 28}{31}$ = 97%

PEDIATRIC HEMODIALYSIS: Other Measures

TABLE 76: Ethnicity [Question 13]

Network Re-Abstracted Data

	Missing	Non-Hispanic	Hispanic, Mexican American	Hispanic, Puerto Rican	Hispanic, other	Total
Missing	1	1	0	0	0	2
Non-Hispanic	0	18	0	1	1	20
Hispanic, Mexican American	0	1	6	1	0	8
Hispanic, other	0	0	0	0	1	1
Total	1	20	6	2	2	31

Facility Abstracted Data

Kappa = 0.70

Level of concurrence = $\frac{1 + 18 + 6 + 1}{31}$ = 84%

PEDIATRIC HEMODIALYSIS: Other Measures

TABLE 77: Diabetes diagnosis [Question 16]

Network Re-Abstracted Data

	Missing	**Yes**	**No**	**Unknown**	**Total**
Missing	**1**	0	0	1	2
No	0	1	**28**	0	29
Total	1	1	28	1	**31**

(row label, rotated left: Facility Abstracted Data)

Kappa = 0.58
Level of concurrence = $\frac{1 + 28}{31}$ = 94%

TABLE 78: Agreement rate of data abstracted by dialysis facility staff to data re-abstracted by ESRD Network staff for selected pediatric hemodialysis measures

Measure	**Agreement rate**	**Number of cases agreed upon**	**Total number of cases**
Most recent date patient returned to pediatric hemodialysis [Question 11]	66%	4	6^
Epoetin dose #1 [Question 18B2]	87%	27	31
Epoetin dose #2 [Question 18B2]	84%	26	31
Epoetin dose #3 [Question 18B2]	84%	26	31
IV iron administration dose [Question 18G]	71%	22	31
Pre-dialysis BUN [Question 20F]	90%	28	31
Post- dialysis BUN [Question 20G]	94%	29	31
Pre-dialysis weight [Question 20H]	71%	22	31
Post-dialysis weight [Question 20H]	61%	19	31

^ Approximately 74% of the facility abstracted data were missing for this item, approximately 3% of the Network re-abstracted data were missing and 3% were missing from both facility and re-abstracted Network data for this item.

2004 ESRD Clinical Performance Measures
Reliability Report
Part II – Supplemental LDO Report

Objective

This supplement to the 2004 ESRD CPM Reliability Report includes analysis of data from five Large Dialysis Organizations (LDOs) to compare inter-rater reliability of original electronically submitted data to revised LDO and non-LDO data. The ESRD Network re-abstracted data were used as the "gold standard" to which these data were compared to assess the accuracy of electronically submitted data.

Background

All participating non-LDO facilities submitted their data using the traditional manual ESRD CPM data collection forms. This year, the LDOs initially submitted their data electronically from their corporate data repositories, using QNet Exchange, to Computer Sciences Corporation (CSC), a contractor to CMS, and from there to the ESRD Network offices. These data are called "original LDO data". After receiving these data, ESRD Networks noted some of the LDO data were incomplete or erroneous (e.g., albumin data from one LDO was rounded up to the next whole number). The ESRD Networks were then directed by CMS to produce and distribute manual ESRD CPM forms pre-populated with each facility's electronically submitted data elements to the respective LDO facility staff for completion and verification. These data are the "revised LDO" or "facility-updated" data.

Project Methods

The same statistical methods used to examine inter-rater reliability for the Part I report were used for this Part II report, with the following exceptions:

1. A two-sample t-test was used to compare mean agreement rates between the following comparison groups:

    Non-LDO vs. original LDO
    Non-LDO vs. revised LDO

2. Data that were collected in multiple months were all included in the analysis (in Part I only one month's data were randomly selected).

3. Table 2 and Table 4 contain the inter-rater reliability testing results for all variables excluding fields 1–10 and 12. All fields were analyzed as data were submitted without any data transformation (e.g., patient's weight was compared without converting pounds to kilograms, or visa versa).

4. In Tables 1 and 3, the field variables were converted to the same measurement unit prior to analysis; e.g., any weight measurements submitted in pounds were changed to kilograms and any height measurements submitted in inches were submitted in centimeters.

Findings

The following tables are included in the Part II report:

1. Table 1: Comparison of Mean Agreement Rate for Non-LDO to Original LDO and Non-LDO to Revised LDO Hemodialysis Data.

2. Table 2: Comparison of Agreement Rate for Revised LDO to Original LDO Hemodialysis Data for all Form Items.

3. Table 3: Comparison of Mean Agreement Rate for Non-LDO to Original LDO and Non-LDO to Revised LDO Peritoneal Dialysis Data.

4. Table 4: Comparison of Agreement Rate for Revised LDO to Original LDO Peritoneal Dialysis Data for all Form Items.

In Table 1, the agreement rate for certain form items in the original LDO data were statistically significantly lower than the non-LDO data. For example, agreement rates for ethnicity, amputation, EPO dosage, patient weights, and vascular access related fields were very low for original LDO data.

For several form items statistically significant differences were seen in both the revised LDO data and the original LDO data in comparison to the non-LDO data. Examples are seen in EPO dosage and lab method used for albumin.

In Table 2, comparing inter-rater reliability between revised LDO to original LDO data, the vast majority of the revised LDO data are more accurate when compared to the "gold standard" ESRD Network re-abstracted data than original LDO data.

In Table 3, the agreement rate for certain form items in the original LDO data were statistically significantly lower than the non-LDO data. For example, agreement rates for ethnicity, amputation, route of EPO administration, and peritoneal dialysis prescription related fields were very low for original LDO data. For the revised LDO data such a difference was not observed.

In Table 4, comparing inter-rater reliability between revised LDO to original LDO data, the vast majority of the revised LDO data are more accurate when compared to the "gold standard" ESRD Network re-abstracted data than original LDO data.

Overall the agreement rate for the original LDO electronically submitted data are lower than the revised LDO data and the non-LDO data.

Table 1. Comparison of Mean Agreement Rate for Non-LDO to Original LDO and Non-LDO to Revised LDO Hemodialysis Data

Form Number and Definition	Mean Agreement Rate and P-Value			Mean Agreement Rate and P-Value		
	Non LDO abstracted data vs Network re-abstracted data	Original LDO electronic data vs Network re-abstracted data	P-Value	Non LDO abstracted data vs Network re-abstracted data	Revised LDO electronic and manual data vs Network re-abstracted data	P-Value
Most recent date returned to hemodialysis(HDForm 11)	14.10%	20.27%	0.0831	14.10%	15.88%	0.5933
Ethnicity of the patients(HDForm 13)	92.07%	0.00%	0.0001	92.07%	91.42%	0.7994
Patient's pre-amputation height (HDForm 14)	0.70%	0.37%	0.0001	0.70%	0.43%	0.0001
Dose patient have limb/leg amputation(HDForm 15)	93.83%	58.11%	0.0001	93.83%	92.70%	0.6301
Has the patient ever been diagnosed with diabetes(HDForm 16)	93.83%	95.05%	0.5764	93.83%	94.85%	0.6376
Was the patient take medications to control diabetes(HDForm 17)	89.43%	54.05%	0.0001	89.43%	80.26%	0.0061
Is the patient using insulin(HDForm 17)	85.46%	50.90%	0.0001	85.46%	87.12%	0.6052
1first monthly lab hgb(<11 or >=11) (HDForm 18A) Oct 2003	96.04%	91.44%	0.0443	96.04%	93.99%	0.3157
first monthly lab hgb(<9 or >=9) (HDForm 18A) Oct 2003	98.68%	95.95%	0.0730	98.68%	98.71%	0.9744
1first monthly lab hgb(<11 or >=11) (HDForm 18A) Nov 2003	97.36%	93.69%	0.0602	97.36%	94.42%	0.1141
first monthly lab hgb(<9 or >=9) (HDForm 18A) Nov 2003	98.24%	97.75%	0.7118	98.24%	97.85%	0.7670
1first monthly lab hgb(<11 or >=11) (HDForm 18A) Dec2003	97.80%	95.50%	0.1755	97.80%	94.85%	0.0943
first monthly lab hgb (<9 or >=9) (HDForm 18A) Dec2003	98.68%	97.75%	0.4572	98.68%	97.00%	0.2168

prescription for EPO(HDForm 18B1a) Oct 2003	92.07%	79.73%	0.0002	92.07%	96.14%	0.0638
prescription for EPO(HDForm 18B1a) Nov 2003	93.39%	86.94%	0.0214	93.39%	93.56%	0.9413
prescription for EPO(HDForm 18B1a) Dec2003	95.15%	90.99%	0.0826	95.15%	94.42%	0.7242
epoetin dose #1 Oct2003 (HDForm 18B2a) Oct 2003	82.82%	62.16%	0.0001	82.82%	77.68%	0.1675
epoetin dose #2 Oct2003 (HDForm 18B2a) Oct 2003	80.18%	59.01%	0.0001	80.18%	74.68%	0.1594
epoetin dose #3 Oct2003 (HDForm 18B2a) Oct 2003	79.74%	56.31%	0.0001	79.74%	75.11%	0.2364
epoetin dose #1 Nov2003 (HDForm 18B2a) Nov 2003	82.82%	68.47%	0.0004	82.82%	74.68%	0.0330
epoetin dose #2 Nov2003 (HDForm 18B2a) Nov 2003	81.06%	64.86%	0.0001	81.06%	72.53%	0.0305
epoetin dose #3 Nov2003 (HDForm 18B2a) Nov 2003	80.62%	63.51%	0.0001	80.62%	71.67%	0.0246
epoetin dose #1 Dec2003 (HDForm 18B2a) Dec 2003	80.18%	69.82%	0.0112	80.18%	75.54%	0.2320
epoetin dose #2 Dec2003 (HDForm 18B2a) Dec 2003	81.50%	66.22%	0.0002	81.50%	73.39%	0.0378
epoetin dose #3 Dec2003 (HDForm 18B2a) Dec 2003	79.74%	55.86%	0.0001	79.74%	69.96%	0.0157
prescribed route of EPO adminstration Oct (HDForm 18B4a) Oct 2003	92.07%	87.39%	0.1023	92.07%	96.14%	0.0638
prescribed route of EPO adminstration(HDForm 18B4a) Nov 2003	91.19%	92.34%	0.6578	91.19%	93.13%	0.4389
prescribed route of EPO adminstration(HDForm 18B4a) Dec 2003	94.27%	92.34%	0.4138	94.27%	93.56%	0.7505
first monthly serum ferritin concentration (<100 or >=100)(HDForm 18C) Oct 2003	92.95%	96.85%	0.0614	92.95%	96.14%	0.1324
first monthly serum ferritin concentration(<100 or >=100) (HDForm 18C) Nov 2003	95.15%	98.65%	0.0332	95.15%	98.28%	0.0591
first monthly serum ferritin concentration(<100 or >=100) (HDForm 18C) Dec 2003	93.83%	93.69%	0.9516	93.83%	92.27%	0.5125

first monthly transferrin saturation(<20 or >=20) (HDForm 18D) Oct 2003	94.27%	96.85%	0.1871	94.27%	97.85%	0.0478
first monthly transferrin saturation (<20 or >=20) (HDForm 18D) Nov 2003	95.15%	96.85%	0.3618	95.15%	97.85%	0.1146
first monthly transferrin saturation (<20 or >=20) (HDForm 18D) Dec 2003	94.71%	95.95%	0.5374	94.71%	94.42%	0.8901
IV iron administration Dose (HDForm 18G) Oct2003	75.57%	72.52%	0.4329	75.57%	74.68%	0.7866
IV iron administration Dose (HDForm 18G) Nov 2003	82.38%	70.27%	0.0025	82.38%	75.97%	0.0910
IV iron administration Dose Oct2003 (HDForm 18G) Dec 2003	77.09%	66.67%	0.0139	77.09%	71.67%	0.1841
First monthly serum albumin (<3.5/3.2 or >=3.5/3.2) (HDForm 19A_B) Oct 2003	94.71%	96.40%	0.3886	94.71%	98.28%	0.0368
First monthly serum albumin (<3.5/3.2 or >=3.5/3.2) (HDForm 19A_B) Nov 2003	94.27%	97.75%	0.0608	94.27%	98.28%	0.0226
First monthly serum albumin (<3.5/3.2 or >=3.5/3.2) (HDForm 19A_B) Dec 2003	96.04%	97.30%	0.4580	96.04%	97.00%	0.5750
Lab method used for albumin result(HDForm 19B) Oct 2003	88.99%	93.69%	0.0769	88.99%	98.28%	0.0001
Lab method used for albumin result(HDForm 19B) Nov 2003	87.22%	96.85%	0.0002	87.22%	97.85%	0.0001
Lab method used for albumin result(HDForm 19B) Dec 2003	88.99%	95.50%	0.0100	88.99%	96.57%	0.0016
number of times per week (<3 or >=3) (HDForm 20A) Oct 2003	98.24%	77.03%	0.0001	98.24%	97.00%	0.3844
number of times per week (<3 or >=3) (HDForm 20A) Nov 2003	98.68%	75.23%	0.0001	98.68%	97.85%	0.5000
number of times per week (<3 or >=3) (HDForm 20A) Dec 2003	98.68%	65.77%	0.0001	98.68%	93.99%	0.0077
recoded kt_v (<1.2 or >=1.2) (HDForm 20C) Oct 2003	90.75%	87.39%	0.2544	90.75%	87.98%	0.3374
recoded kt_v (<1.2 or >=1.2) (HDForm 20C) Nov 2003	88.55%	84.68%	0.2302	88.55%	87.12%	0.6419

recoded kt_v (<1.2 or >=1.2) (HDForm 20C) Dec 2003	89.87%	84.68%	0.0995	89.87%	84.98%	0.1147
Method used to calculate Kt/v(20D) Oct 2003	74.45%	70.27%	0.3231	74.45%	77.25%	0.4833
Method used to calculate Kt/v(20D) Nov 2003	72.69%	72.52%	0.9686	72.69%	75.54%	0.4865
Method used to calculate Kt/v(20D) Dec 2003	75.77%	68.92%	0.1049	75.77%	73.39%	0.5588
Is residual urine function used to calculate Ktv(HDForm 20E) Oct 2003	73.13%	62.61%	0.0170	73.13%	74.68%	0.7057
Is residual urine function used to calculate Ktv(HDForm 20E) Nov 2003	71.81%	58.56%	0.0031	71.81%	71.67%	0.9749
Is residual urine function used to calculate Ktv(HDForm 20E) Dec 2003	72.25%	55.41%	0.0002	72.25%	67.38%	0.2569
Pre-dialysis BUN Oct2003 (HDForm 20F) Oct 2003	93.39%	92.34%	0.6664	93.39%	95.28%	0.3820
Pre-dialysis BUN Nov2003 (HDForm 20F) Nov 2003	90.75%	92.79%	0.4321	90.75%	95.28%	0.0564
Pre-dialysis BUN Dec2003 (HDForm 20F) Dec 2003	92.95%	92.70%	0.9183	92.95%	93.24%	0.9033
Post-dialysis BUN Oct2003 (HDForm 20F) Oct 2003	95.15%	93.24%	0.3872	95.15%	95.71%	0.7765
Post-dialysis BUN Nov2003 (HDForm 20F) Nov 2003	92.07%	94.14%	0.3873	92.07%	95.28%	0.1576
Post-dialysis BUN Dec2003 (HDForm 20F) Dec 2003	92.95%	92.79%	0.9480	92.95%	91.42%	0.5409
Pre-dialysis weight Oct2003 (HDForm 20H) Oct 2003	80.62%	0.71%	0.0144	80.62%	0.76%	0.2275
Post-dialysis weight Oct2003 (HDForm 20H) Oct 2003	81.50%	69.37%	0.0028	81.50%	75.11%	0.0971
Pre-dialysis weight Nov2003 (HDForm 20H) Nov 2003	78.85%	0.69%	0.0164	78.85%	0.74%	0.2449
Post-dialysis weight Nov2003 (HDForm 20H) Nov 2003	0.79%	0.69%	0.0164	0.79%	0.74%	0.2449
Pre-dialysis weight Dec2003 (HDForm 20H) Dec 2003	76.65%	0.69%	0.0521	76.65%	69.53%	0.0855
Post-dialysis weight Dec2003 (HDForm 20H) Dec 2003	74.01%	0.70%	0.3244	74.01%	0.71%	0.5073

Type of access in use on the last hemodialysis session (HDForm 21A)	92.07%	77.48%	0.0001	92.07%	88.41%	0.1875
routine monitoring (HDForm 21B1)	72.69%	48.20%	0.0001	72.69%	70.82%	0.6566
color flow doppler(HDForm 21B2)	98.68%	96.40%	0.1184	98.68%	99.14%	0.6328
static venous pressure (HDForm 21B2)	97.80%	96.85%	0.5334	97.80%	99.14%	0.2399
Dynamic venous pressure(HDForm 21B2)	82.38%	69.37%	0.0012	82.38%	74.25%	0.0346
dilution technique at least onece (HDForm 21B2)	97.80%	95.95%	0.2601	97.80%	97.85%	0.9668
Other stenosis monitoring method used(HDForm 21B2)	93.83%	90.99%	0.2561	93.83%	89.70%	0.1079
reason for having catheter(HDForm 21C1)	87.67%	73.42%	0.0001	87.67%	85.41%	0.4795
used for last 90 days or longer(HDForm 21C2)	89.43%	80.63%	0.0088	89.43%	86.70%	0.3677
type of access in use at the initiation(HDForm 22A)	91.19%	92.79%	0.5327	91.19%	96.57%	0.0158
type of access for this patient in use 90 days(HDForm 22B)	91.19%	92.79%	0.5327	91.19%	96.14%	0.0291

Table 2. Comparison of Agreement Rate for Revised LDO to Original LDO Hemodialysis Data for all Form Items

Total number of reliability cases: 221

Form No.	Definition	Continuous Variables				Categorical Variables			
		Revised		Original		Revised		Original	
		# of cases agreed	Agreement Rate	# of cases agreed	Agreement Rate	Kappa	LOC	Kappa	LOC
11	Most recent date patient returned to hemodialysis following: transplant failure, an episode of regained kidney function, or switched modality.	33	14.9%	45	20.4%				
13	Denotes ethnicity of the patient					0.67	91.9%	0.00	0.0%
14	Patient's pre-amputation height	62	28.1%	42	19.0%				
14	Patient's pre-amputation height units					0.06	56.6%		52.5%
15	Did patient have limb amputation(s) prior to 12/31/2003					0.67	93.7%	0.14	58.4%
16	Has the patient ever been diagnosed with any type of diabetes					0.90	95.0%	0.90	95.0%
17	Was the patient taking medications to control the diabetes during the study period					0.70	79.2%	0.40	54.3%
17	Was the patient using insulin during the study period					0.73	86.4%	0.33	50.7%
18A	Pre-dialysis laboratory hemoglobin (HGB) from the monthly lab draw (OCT 2003)	146	66.1%	135	61.1%				
18A	Pre-dialysis laboratory hemoglobin (HGB) from the monthly lab draw (NOV 2003)	154	69.7%	147	66.5%				
18A	Pre-dialysis laboratory hemoglobin (HGB) from the monthly lab draw (DEC 2003)	150	67.9%	144	65.2%				
18B1a	Was there a prescription for EPO during the seven days immediately before the above HGB was drawn (OCT 2003)					0.88	96.4%	0.42	79.6%

18B1a	Was there a prescription for EPO during the seven days immediately before the above HGB was drawn (NOV 2003)					0.72	93.2%	0.51	86.9%
18B1a	Was there a prescription for EPO during the seven days immediately before the above HGB was drawn (DEC 2003)					0.75	95.0%	0.57	91.0%
18B2a	Prescribed EPO dose in units for the first treatment during the seven days immediately BEFORE the above HGB was drawn (OCT 2003)	170	76.9%	137	62.0%				
18B2a	Prescribed EPO dose in units for the second treatment during the seven days immediately BEFORE the above HGB was drawn (OCT 2003)	163	73.8%	130	58.8%				
18B2a	Prescribed EPO dose in units for the third treatment during the seven days immediately BEFORE the above HGB was drawn (OCT 2003)	164	74.2%	124	56.1%				
18B2a	Prescribed EPO dose in units for the first treatment during the seven days immediately BEFORE the above HGB was drawn (NOV 2003)	165	74.7%	151	68.3%				
18B2a	Prescribed EPO dose in units for the second treatment during the seven days immediately BEFORE the above HGB was drawn (NOV 2003)	160	72.4%	143	64.7%				
18B2a	Prescribed EPO dose in units for the third treatment during the seven days immediately BEFORE the above HGB was drawn (NOV 2003)	157	71.0%	140	63.3%				
18B2a	Prescribed EPO dose in units for the first treatment during the seven days immediately BEFORE the above HGB was drawn (DEC 2003)	167	75.6%	155	70.1%				

18B2a	Prescribed EPO dose in units for the second treatment during the seven days immediately BEFORE the above HGB was drawn (DEC 2003)	162	73.3%	147	66.5%				
18B2a	Prescribed EPO dose in units for the third treatment during the seven days immediately BEFORE the above HGB was drawn (DEC 2003)	153	69.2%	123	55.7%				
18B3a	How many times per week was EPO prescribed (OCT 2003)	207	93.7%	158	71.5%				
	EPO prescribed less than 1 time per week (OCT 2003)					1.00	100.0%	1.00	100.0%
18B3a	How many times per week was EPO prescribed (NOV 2003)	202	91.4%	158	71.5%				
	EPO prescribed less than 1 time per week (NOV2003)					0.00	99.1%	0.00	99.1%
18B3a	How many times per week was EPO prescribed (DEC 2003)	201	91.0%	147	66.5%				
	EPO prescribed less than 1 time per week (DEC 2003)						100.0%		100.0%
18B4a	Prescribed route of EPO administration (OCT 2003)					0.89	96.4%	0.65	87.3%
18B4a	Prescribed route of EPO administration (NOV 2003)					0.75	92.8%	0.74	92.3%
18B4a	Prescribed route of EPO administration (DEC 2003)					0.76	94.1%	0.69	92.3%
18B1b	Was there a prescription for Darbepoetin during the month immediately before the above HGB was drawn (OCT 2003)					0.66	92.3%	0.06	59.3%
18B1b	Was there a prescription for Darbepoetin during the month immediately before the above HGB was drawn (NOV 2003)					0.56	93.2%	0.02	59.3%

Item	Description								
18B1b	Was there a prescription for Darbepoetin during the month immediately before the above HGB was drawn (DEC 2003)					0.44	92.8%	0.03	59.7%
18B2b	Prescribed Darbepoetin dose in micrograms for the month immediately BEFORE the above HGB was drawn (OCT 2003)	220	99.5%	220	99.5%				
18B2b	Prescribed Darbepoetin dose in micrograms for the month immediately BEFORE the above HGB was drawn (NOV 2003)	221	100.0%	220	99.5%				
18B2b	Prescribed Darbepoetin dose in micrograms for the month immediately BEFORE the above HGB was drawn (DEC 2003)	221	100.0%	220	99.5%				
18B3b	How many times per month was Darbepoetin prescribed (OCT 2003)	220	99.5%	220	99.5%				
18B3b	How many times per month was Darbepoetin prescribed (NOV 2003)	220	99.5%	220	99.5%				
18B3b	How many times per month was Darbepoetin prescribed (DEC 2003)	220	99.5%	220	99.5%				
18B4b	Prescribed route of Darbepoetin administration (OCT 2003)					1.00	100.0%	0.00	99.5%
18B4b	Prescribed route of Darbepoetin administration (NOV 2003)					1.00	100.0%	0.00	99.5%
18B4b	Prescribed route of Darbepoetin administration (DEC 2003)					1.00	100.0%	0.00	99.5%
18C	Serum ferritin concentration from the monthly lab draw (OCT 2003)	213	96.4%	214	96.8%				
18C	Serum ferritin concentration from the monthly lab draw (NOV 2003)	216	97.7%	217	98.2%				

18C	Serum ferritin concentration from the monthly lab draw (DEC 2003)	207	93.7%	207	93.7%				
18D	% transferrin (iron) saturation from the monthly lab draw (OCT 2003)	214	96.8%	211	95.5%				
18D	% transferrin (iron) saturation from the monthly lab draw (NOV 2003)	215	97.3%	213	96.4%				
18D	% transferrin (iron) saturation from the monthly lab draw (DEC 2003)	211	95.5%	212	95.9%				
18E	Was iron prescribed during the month (OCT 2003)					0.79	88.7%	0.46	64.3%
18E	Was iron prescribed during the month (NOV 2003)					0.80	89.6%	0.45	63.8%
18E	Was iron prescribed during the month (DEC 2003)					0.76	87.3%	0.43	62.9%
18F	Prescribed route of iron administration (OCT 2003)					0.82	91.0%	0.60	80.1%
18F	Prescribed route of iron administration (NOV 2003)					0.82	91.0%	0.60	79.6%
18F	Prescribed route of iron administration (DEC 2003)					0.78	88.7%	0.57	78.3%
18G	If the patient was prescribed IV iron, what was the total dose of IV iron administered during the month (OCT 2003)	164	74.2%	160	72.4%				
18G	If the patient was prescribed IV iron, what was the total dose of IV iron administered during the month (NOV 2003)	166	75.1%	155	70.1%				
18G	If the patient was prescribed IV iron, what was the total dose of IV iron administered during the month (DEC 2003)	160	72.4%	148	67.0%				

19A	Serum albumin from the monthly lab draw (OCT 2003)	207	93.7%	190	86.0%				
19A	Serum albumin from the monthly lab draw (NOV 2003)	206	93.2%	190	86.0%				
19A	Serum albumin from the monthly lab draw (DEC 2003)	202	91.4%	187	84.6%				
	Lab method used for albumin result (OCT 2003)						98.2%		93.7%
	Lab method used for albumin result (NOV 2003)						97.7%		96.8%
	Lab method used for albumin result (DEC 2003)						97.3%		95.5%
20A	How many times per week was this patient prescribed to receive dialysis (OCT 2003)	210	95.0%	165	74.7%				
20A	How many times per week was this patient prescribed to receive dialysis (NOV 2003)	214	96.8%	163	73.8%				
20A	How many times per week was this patient prescribed to receive dialysis (DEC 2003)	205	92.8%	142	64.3%				
20B	Recorded URR from the monthly lab draw (OCT 2003)	177	80.1%	153	69.2%				
20B	Recorded URR from the monthly lab draw (NOV 2003)	174	78.7%	151	68.3%				
20B	Recorded URR from the monthly lab draw (DEC 2003)	170	76.9%	148	67.0%				
20C	Recorded KTV from the monthly lab draw (OCT 2003)	173	78.3%	170	76.9%				
20C	Recorded KTV from the monthly lab draw (NOV 2003)	167	75.6%	160	72.4%				
20C	Recorded KTV from the monthly lab draw (DEC 2003)	161	72.9%	162	73.3%				
20D	Method used to calculate Kt/V (OCT 2003)					0.70	77.4%	0.60	70.1%
20D	Description of other method to calculate Kt/V (OCT 2003)	202	91.4%	202	91.4%				
20D	Method used to calculate Kt/V (NOV 2003)					0.68	76.0%	0.63	72.4%
20D	Description of other method to calculate Kt/V (NOV 2003)	204	92.3%	204	92.3%				
20D	Method used to calculate Kt/V (DEC 2003)					0.64	73.3%	0.58	68.8%
20D	Description of other method to calculate Kt/V (DEC 2003)	202	91.4%	202	91.4%				

Code	Description							
20E	Was residual renal function used to calculate Kt/V on this patient (OCT 2003)					0.55	75.1%	0.34	62.4%
20E	Was residual renal function used to calculate Kt/V on this patient (NOV 2003)					0.45	72.4%	0.26	58.4%
20E	Was residual renal function used to calculate Kt/V on this patient (DEC 2003)					0.38	67.4%	0.21	55.2%
20F	Pre-dialysis BUN value from the monthly lab draw (OCT 2003)	211	95.5%	204	92.3%				
20F	Pre-dialysis BUN value from the monthly lab draw (NOV 2003)	210	95.0%	205	92.8%				
20F	Pre-dialysis BUN value from the monthly lab draw (DEC 2003)	207	93.7%	206	93.2%				
20G	Post-dialysis BUN value from the monthly lab draw (OCT 2003)	211	95.5%	206	93.2%				
20G	Post-dialysis BUN value from the monthly lab draw (NOV 2003)	210	95.0%	208	94.1%				
20G	Post-dialysis BUN value from the monthly lab draw (DEC 2003)	204	92.3%	205	92.8%				
20H	Patient pre-dialysis weight when BUN's were drawn (OCT 2003)	171	77.4%	158	71.5%				
20H	Pre-dialysis weight unit of measure (OCT 2003)					0.58	82.4%	0.38	71.5%
20H	Patient post-dialysis weight when BUN's were drawn (OCT 2003)	169	76.5%	156	70.6%				
20H	Post dialysis weight unit of measure (OCT 2003)					0.58	82.4%	0.38	71.5%
20H	Patient pre-dialysis weight when BUN's were drawn (NOV 2003)	165	74.7%	155	70.1%				
20H	Pre-dialysis weight unit of measure (NOV 2003)					0.46	81.0%	0.34	73.8%
20H	Patient post-dialysis weight when BUN's were drawn (NOV 2003)	164	74.2%	153	69.2%				
20H	Post dialysis weight unit of measure (NOV 2003)					0.44	80.5%	0.33	73.3%

20H	Patient pre-dialysis weight when BUN's were drawn (DEC 2003)	155	70.1%	152	68.8%				
20H	Pre-dialysis weight unit of measure (DEC 2003)					0.41	79.6%	0.35	74.2%
20H	Patient post-dialysis weight when BUN's were drawn (DEC 2003)	161	72.9%	157	71.0%				
20H	Post dialysis weight unit of measure (DEC 2003)					0.41	79.6%	0.35	74.2%
20I	Actual delivered time on dialysis at session when BUN were drawn - hours (OCT 2003)	209	94.6%	202	91.4%				
20I	Actual delivered time on dialysis at session when BUNs were drawn - minutes (OCT 2003)	176	79.6%	169	76.5%				
20I	Actual delivered time on dialysis at session when BUN's were drawn - hours (NOV 2003)	205	92.8%	203	91.9%				
20I	Actual delivered time on dialysis at session when BUN's were drawn - minutes (NOV 2003)	180	81.4%	178	80.5%				
20I	Actual delivered time on dialysis at session when BUN's were drawn - hours (DEC 2003)	196	88.7%	197	89.1%				
20I	Actual delivered time on dialysis at session when BUN's were drawn - minutes (DEC 2003)	162	73.3%	163	73.8%				
20J	Delivered blood pump flow rate @ 60 min. after start of the dialysis session at which BUN's are drawn (OCT 2003)	150	67.9%	133	60.2%				
20J	Delivered blood pump flow rate @ 60 min. after start of the dialysis session at which BUN's are drawn (NOV 2003)	132	59.7%	122	55.2%				
20J	Delivered blood pump flow rate @ 60 min. after start of the dialysis session at which BUN's are drawn (DEC 2003)	139	62.9%	130	58.8%				
20K	Code for dialyzer used for dialysis session when BUN's were drawn (OCT 2003)	203	91.9%	197	89.1%				

Code	Description								
20K	Code for dialyzer used for dialysis session when BUN's were drawn (NOV 2003)	202	91.4%	200	90.5%				
20K	Code for dialyzer used for dialysis session when BUN's were drawn (DEC 2003)	196	88.7%	195	88.2%				
21A	Type of access in use on the last hemodialysis session on or between 10/1/2003 and 12/31/2003 at the patient's primary incenter facility					0.83	88.7%	0.69	77.8%
21B1	Was routine surveillance for the presence of stenosis performed between 10/1/2003 and 12/31/2003					0.57	71.5%	0.24	48.0%
21B2	Color-Flow Doppler at least once between 10/1/2003 and 12/31/2003					0.50	99.1%	-0.01	96.4%
21B2	Static Venous Pressure at least once every 2 weeks between 10/1/2003 and 12/31/2003					0.00	99.1%	-0.01	96.8%
21B2	Dynamic Venous Pressure every HD session between 10/1/2003 and 12/31/2003					0.48	74.2%	0.35	69.2%
21B2	Dilution Technique at least once between 10/1/2003 and 12/31/2003					0.43	97.7%	0.09	95.9%
21B2	Other stenosis monitoring method used					0.37	90.0%	0.00	91.0%
21B2	Description of other stenosis monitoring method	194	87.8%	196	88.7%				
21C1	Reason for having a catheter or port access					0.63	85.1%	0.00	73.8%
21C1-5	If CATHREASON=5, Peripheral vascular disease					0.00	99.5%	0.00	99.5%
21C1-5	If CATHREASON=5, Patient size too small for AV fistula or graft					0.00	99.5%		100.0%
	If CATHREASON=5, Renal transplantation scheduled						100.0%		100.0%
21C1-5	If CATHREASON=5, Patient preference					0.43	97.7%	0.00	98.2%
21C1-5	If CATHREASON=5, Provider preference					0.33	98.2%	0.00	99.1%
	If CATHREASON=9, Description of other reason for catheter								
21C2	Had a catheter or port access been used exclusively for the past 90 days or longer					0.65	86.4%	0.47	81.0%

22	Did the patient FIRST start hemodialysis during January 1, 2003 - August 31, 2003? DO NOT include patients who have changed modality, had a newly failed transplant, or returned after an episode of regained kidney function	0.82	96.4%	0.29	72.9%
22A	What type of access was in use at the Initiation of a maintenance course of hemodialysis	0.84	96.8%	0.52	93.2%
22B	What type of access was in use 90 days after the Initiation of a maintenance course of hemodialysis	0.82	96.4%	0.55	93.2%

Table 3. Comparison of Mean Agreement Rate for Non-LDO to Original LDO and Non-LDO to Revised LDO Peritoneal Dialysis Data

Form Number and Definition	Mean Agreement Rate and P-Value			Mean Agreement Rate and P-Value		
	Non LDO abstracted data vs Network re-abstracted data	Original LDO electronic data vs Network re-abstracted data	P-Value	Non LDO abstracted data vs Network re-abstracted data	Revised LDO electronic and manual data vs Network re-abstracted data	P-Value
Denotes ethnicity of the patient (Form13)	93.55%	0.00%	0.0001	93.55%	95.00%	0.7960
Patient's height (Form14A)	0.42%	0.47%	0.7155	0.42%	0.55%	0.2814
First clinic visit weight(PDForm 14B)	35.48%	30.00%	0.6548	35.48%	0.40%	0.7024
Did patient have limb amputation(s) Form 15	96.77%	60.00%	0.0003	96.77%	92.50%	0.4457
Has the patient ever been diagnosed with diabetes(PDForm 16)	100.00%	93.33%	0.1487	100.00%	95.00%	0.2122
Has the patient use medication to control diabetes(PDForm 17)	96.77%	56.67%	0.0001	96.77%	87.50%	0.1681
Is the patient using insulin(PDForm 17)	87.10%	60.00%	0.0158	87.10%	92.50%	0.4560
First Lab hemoglobin during two month time(<11 or >=11) (PDForm 18A) Oct-Nov2003	93.55%	83.33%	0.2174	93.55%	87.50%	0.4037
First Lab hemoglobin during two month time (<9 or >=9) (PDForm 18A) Oct-Nov2003	96.77%	83.33%	0.0804	96.77%	90.00%	0.2750
First Lab hemoglobin during two month time(<11 or >=11)(PDForm 18A) Dec2003-Jan 2004	96.77%	90.00%	0.2931	96.77%	95.00%	0.7172
First Lab hemoglobin during two month time (<9 or >=9) (PDForm 18A) Dec2003-Jan 2004	100.00%	90.00%	0.0730	100.00%	9.00%	0.0716

First Lab hemoglobin during two month time(<11 or >=11) (PDForm 18A) Feb-Mar 2004	90.32%	80.00%	0.2632	90.32%	87.50%	0.7139
First Lab hemoglobin during two month time (<9 or >=9) (PDForm 18A) Feb-Mar 2004	96.77%	86.67%	0.1553	96.77%	92.50%	0.4457
prescription for EPO(PDForm 18B1a) Oct-Nov2003	96.77%	60.00%	0.0003	96.77%	90.00%	0.2750
prescription for EPO(PDForm 18B1a) Dec2003-Jan 2004	87.10%	53.33%	0.0033	87.10%	8.50%	0.8045
prescription for EPO(PDForm 18B1a) Feb-Mar 2004	93.55%	43.33%	0.0001	93.55%	85.00%	0.2649
prescribed weekly EPO dose (PDForm 18B2a) Oct-Nov2003	80.65%	20.00%	0.0001	80.65%	57.50%	0.0392
prescribed weekly EPO dose (PDForm 18B2a) Dec2003-Jan 2004	64.52%	16.67%	0.0001	64.52%	47.50%	0.1573
prescribed weekly EPO dose (PDForm 18B2a) Feb-Mar 2004	51.61%	16.67%	0.0036	51.61%	47.50%	0.7355
prescribed route of EPO adminstration(PDForm 18B4a) Oct-Nov2003	96.77%	60.00%	0.0003	96.77%	92.50%	0.4457
prescribed route of EPO adminstration(PDForm 18B4a) Dec2003-Jan 2004	83.87%	56.67%	0.0196	83.87%	85.00%	0.8981
prescribed route of EPO adminstration(PDForm 18B4a) Feb-Mar 2004	87.10%	53.33%	0.0033	87.10%	85.00%	0.8045
first bimonthly serum ferritin concentration (<100 or >=100) (PDForm 18c) Oct-Nov2003	83.87%	90.00%	0.4866	83.87%	90.00%	0.4486
first bimonthly serum ferritin concentration (<100 or >=100) (PDForm 18c) Dec2003-Jan 2004	90.32%	86.67%	0.6607	90.32%	90.00%	0.9646
first bimonthly serum ferritin concentration (<100 or >=100) (PDForm 18c) Feb-Mar 2004	87.10%	80.00%	0.4625	87.10%	85.00%	0.8045

first bimonthly fransterrin saturation (<20 or >=20) (PDForm 18D) Oct-Nov2003	80.65%	86.67%	0.5333	80.65%	92.50%	0.1404
first bimonthly fransterrin saturation (<20 or >=20) (PDForm 18D) Dec2003-Jan 2004	93.55%	93.33%	0.9735	93.55%	97.50%	0.4189
first bimonthly fransterrin saturation (<20 or >=20) (PDForm 18D) Feb-Mar 2004	93.55%	93.33%	0.9735	93.55%	92.50%	0.8664
What was the IV iron dose (PDForm 18G) Oct-Nov2003	96.77%	93.33%	0.5423	96.77%	85.00%	0.1016
What was the IV iron dose (PDForm 18G) Dec2003-Jan 2004	93.55%	100.00%	0.1624	93.55%	95.00%	0.7960
What was the IV iron dose (PDForm 18G) Feb-Mar 2004	90.32%	96.67%	0.3251	90.32%	95.00%	0.4521
First bimonthly serum albumin (<3.5/3.2 or >=3.5/3.2) (PDForm 19A) Oct-Nov2003	93.55%	86.67%	0.3753	93.55%	92.50%	0.8664
First bimonthly serum albumin (<3.5/3.2 or >=3.5/3.2) (PDForm 19A) Dec2003-Jan 2004	93.55%	90.00%	0.6205	93.55%	92.50%	0.8664
First bimonthly serum albumin (<3.5/3.2 or >=3.5/3.2) (PDForm 19A) Feb-Mar 2004	90.32%	90.00%	0.9670	90.32%	95.00%	0.4521
Lab method used for albumin result(PDForm 19B) Oct-Nov2003	93.55%	93.33%	0.9735	93.55%	97.50%	0.4189
Lab method used for albumin result(PDForm 19B) Dec2003-Jan 2004	96.77%	100.00%	0.3294	96.77%	97.50%	0.8571
Lab method used for albumin result(PDForm 19B) Feb-Mar 2004	100.00%	96.67%	0.3134	100.00%	97.50%	0.3825
patients weight (PDForm 21C)	0.68%	0.53%	0.2568	0.68%	0.68%	0.9831
Reported weekly kt/v(PDForm 21D)	87.10%	70.00%	0.1065	87.10%	95.00%	0.2411
reported weekly kt/v (2 or >=2) (PDForm 21D)	74.19%	63.33%	0.3682	74.19%	82.50%	0.4023
Method by which v was calculated(PDForm 21E)	67.74%	53.33%	0.2568	67.74%	72.50%	0.6685
Reported weekly creatinine clearance(PDForm 21F)	58.06%	63.33%	0.6798	58.06%	75.00%	0.1342
Reported weekly creatinine clearance (<60 or >=60) (PDForm 21F)	90.32%	66.67%	0.0240	90.32%	87.50%	0.7139

Creatinine clearance correction (PDForm 21G)	93.55%	70.00%	0.0164	93.55%	87.50%	0.4037
24 hr dialysate volume(PDForm 21H)	83.87%	26.67%	0.0001	83.87%	67.50%	0.1191
24 hr dialysate urea nitrogen(PDForm 21I)	90.32%	60.00%	0.0054	90.32%	82.50%	0.3545
24 hr dialysate creatinine(PDForm 21J)	87.10%	56.67%	0.0075	87.10%	80.00%	0.4359
24 hr urine volume(PDForm 21K)	93.55%	73.33%	0.0333	93.55%	90.00%	0.6001
24 hr urine urea nitrogen(PDForm 21L)	87.10%	66.67%	0.0593	87.10%	87.50%	0.9603
24 hr urine creatinine(PDForm 21M)	90.32%	73.33%	0.0871	90.32%	92.50%	0.7479
serum BUN (PDForm 21N)	87.10%	66.67%	0.0593	87.10%	90.00%	0.7061
serum createinine(PDForm 21O)	87.10%	66.67%	0.0593	87.10%	90.00%	0.7061
Number of dialysis days per week(PDForm 22A1)	93.55%	73.33%	0.0333	93.55%	97.50%	0.4189
Total number of exchanges per 24 hours (PDForm 22A3)	90.32%	70.00%	0.0468	90.32%	97.50%	0.1986
number of dialysis exchanges during the daytime (PDForm 22B4b)	93.55%	46.67%	0.0001	93.55%	87.50%	0.4037
number of dialysis exchanges during nighttime(PDForm 22B5b)	93.55%	46.67%	0.0001	93.55%	77.50%	0.0653
was the prescription changed (PDForm 22C2)	80.65%	16.67%	0.0001	80.65%	80.00%	0.9469
patients weight (PDForm 23C)	0.74%	56.67%	0.1548	0.74%	0.80%	0.5679

Table 4. Comparison of Agreement Rate for Revised LDO to Original LDO Peritoneal Dialysis Data for all Form Items

Total number of reliability cases: 30

| | | Continuous Variables | | | | Categorical Variables | | | |
| | | Revised | | Original | | Revised | | Original | |
Form No.	Definition	# of case agreed	Agreement Rate	# of case agreed	Agreement Rate	Kappa	LOC	Kappa	LOC
11	Most recent date patient returned to peritoneal dialysis following: transplant failure, an episode of regained kidney function, or switched modality.	3	10.0%	7	23.3%				
13	Denotes ethnicity of the patient					0.74	96.7%	0.00	0.0%
14a	Patient's height	7	23.3%	4	13.3%				
14a	Patient's height units					0.03	36.7%		33.3%
14b	Patient's weight at first clinic visit after Oct 1, 2003	9	30.0%	8	26.7%				
14b	Unit of measure used for clinic weight					-0.01	66.7%	-0.20	63.3%
15	Did patient have limb amputation(s) prior to 03/31/2004					-0.03	90.0%	0.02	60.0%
16	Has the patient ever been diagnosed with any type of diabetes					0.86	93.3%	0.86	93.3%
17	Was the patient taking medications to control the diabetes during the study period					0.73	83.3%	0.39	56.7%
17	Was the patient using insulin during the study period					0.82	90.0%	0.43	60.0%
18A	First laboratory hemoglobin during the two month time period (OCT-NOV 2003)	24	80.0%	23	76.7%				

18A	First laboratory hemoglobin during the two month time period (DEC 2003 - JAN 2004)	26	86.7%	26	86.7%				
18A	First laboratory hemoglobin during the two month time period (FEB-MAR 2004)	23	76.7%	22	73.3%				
18B1a	Did patient have a prescription for EPO immediately before the above HGB was drawn (OCT-NOV 2003)					0.71	86.7%	0.23	60.0%
18B1a	Did patient have a prescription for EPO immediately before the above HGB was drawn (DEC 2003 - JAN 2004)					0.32	80.0%	0.10	53.3%
18B1a	Did patient have a prescription for EPO immediately before the above HGB was drawn (FEB-MAR 2004)					0.45	80.0%	0.04	43.3%
18B2a	Prescribed monthly EPO dose at the time immediately before the above HGB was drawn (OCT-NOV 2003)	15	50.0%	6	20.0%				
18B2a	Prescribed monthly EPO dose at the time immediately before the above HGB was drawn (DEC 2003 - JAN 2004)	12	40.0%	5	16.7%				
18B2a	Prescribed monthly EPO dose at the time immediately before the above HGB was drawn (FEB-MAR 2004)	14	46.7%	5	16.7%				
18B3a	How many times per month was EPO prescribed (OCT-NOV 2003)	23	76.7%	8	26.7%				
18B3a	How many times per month was EPO prescribed (DEC 2003 - JAN 2004)	20	66.7%	5	16.7%				
18B3a	How many times per month was EPO prescribed (FEB-MAR 2004)	21	70.0%	7	23.3%				

Code	Description								
18B4a	Prescribed route of EPO administration (OCT-NOV 2003)					0.76	90.0%	0.12	60.0%
18B4a	Prescribed route of EPO administration (DEC 2003 - JAN 2004)					0.30	80.0%	0.08	56.7%
18B4a	Prescribed route of EPO administration (FEB-MAR 2004)					0.51	83.3%	0.10	53.3%
18B1b	Was there a prescription for Darbepoetin during the month immediately BEFORE the above HGB was drawn (OCT-NOV 2003)					0.68	90.0%	0.13	63.3%
18B1b	Was there a prescription for Darbepoetin during the month immediately BEFORE the above HGB was drawn (DEC 2003 - JAN 2004)					-0.03	83.3%	0.12	66.7%
18B1b	Was there a prescription for Darbepoetin during the month immediately BEFORE the above HGB was drawn (FEB-MAR 2004)					0.32	80.0%	-0.03	56.7%
18B2b	Prescribed Darbepoetin dose in micrograms for the month immediately BEFORE the above HGB was drawn (OCT-NOV 2003)	30	100.0%	30	100.0%				
18B2b	Prescribed Darbepoetin dose in micrograms for the month immediately BEFORE the above HGB was drawn (DEC 2003 - JAN 2004)	30	100.0%	30	100.0%				
18B2b	Prescribed Darbepoetin dose in micrograms for the month immediately BEFORE the above HGB was drawn (FEB-MAR 2004)	30	100.0%	30	100.0%				
18B3b	How many times per month was Darbepoetin prescribed (OCT-NOV 2003)	30	100.0%	30	100.0%				
18B3b	How many times per month was Darbepoetin prescribed (DEC 2003 - JAN 2004)	30	100.0%	30	100.0%				
18B3b	How many times per month was Darbepoetin prescribed (FEB-MAR 2004)	30	100.0%	30	100.0%				

18B4b	Prescribed route of Darbepoetin administration (OCT-NOV 2003)						100.0%		100.0%
18B4b	Prescribed route of Darbepoetin administration (DEC 2003 - JAN 2004)						100.0%		100.0%
18B4b	Prescribed route of Darbepoetin administration (FEB-MAR 2004)						100.0%		100.0%
18C	First serum ferritin concentration during the two month time period (OCT-NOV 2003)	28	93.3%	27	90.0%				
18C	First serum ferritin concentration during the two month time period (DEC 2003 - JAN 2004)	25	83.3%	25	83.3%				
18C	First serum ferritin concentration during the two month time period (FEB-MAR 2004)	23	76.7%	24	80.0%				
18D	First % transferrin (iron) saturation during the two month time period (OCT-NOV 2003)	26	86.7%	25	83.3%				
18D	First % transferrin (iron) saturation during the two month time period (DEC 2003 - JAN 2004)	25	83.3%	25	83.3%				
18D	First % transferrin (iron) saturation during the two month time period (FEB-MAR 2004)	25	83.3%	25	83.3%				
18E	Was iron prescribed at any time during the two month time period (OCT-NOV 2003)					0.78	86.7%	0.04	6.7%
18E	Was iron prescribed at any time during the two month time period (DEC 2003 - JAN 2004)					0.67	83.3%	0.04	6.7%
18E	Was iron prescribed at any time during the two month time period (FEB-MAR 2004)					0.68	83.3%	0.04	6.7%

18F	Prescribed route of iron administration (OCT-NOV 2003)					0.80	90.0%	0.00	63.3%
18F	Prescribed route of iron administration (DEC 2003 - JAN 2004)					0.79	90.0%	0.00	63.3%
18F	Prescribed route of iron administration (FEB-MAR 2004)					0.74	90.0%	0.00	73.3%
18G	If the patient was prescribed IV iron, what was the total dose of IV iron administered during the two month time period (OCT-NOV 2003)	26	86.7%	28	93.3%				
18G	If the patient was prescribed IV iron, what was the total dose of IV iron administered during the two month time period (DEC 2003 - JAN 2004)	29	96.7%	30	100.0%				
18G	If the patient was prescribed IV iron, what was the total dose of IV iron administered during the two month time period (FEB-MAR 2004)	29	96.7%	29	96.7%				
19A	First serum albumin during the two month time period (OCT-NOV 2003)	28	93.3%	26	86.7%				
19A	First serum albumin during the two month time period (DEC 2003 - JAN 2004)	27	90.0%	27	90.0%				
19A	First serum albumin during the two month time period (FEB-MAR 2004)	24	80.0%	24	80.0%				
19B	Lab method used for albumin result (OCT-NOV 2003)					0.71	93.3%	0.26	86.7%
19B	Lab method used for albumin result (DEC 2003 - JAN 2004)					0.00	96.7%		100.0%
19B	Lab method used for albumin result (FEB-MAR 2004)					0.84	96.7%	0.84	96.7%
20A	Was the patient on peritoneal dialysis at any time during this two month period (OCT-NOV 2003)					0.29	86.7%	0.08	46.7%
20A	Was the patient on peritoneal dialysis at any time during this two month period (DEC 2003 - JAN 2004)					0.00	86.7%	0.00	40.0%

ID	Description								
20A	Was the patient on peritoneal dialysis at any time during this two month period (FEB-MAR 2004)					0.53	90.0%	0.09	46.7%
20B	Was patient on hemodialysis or did patient receive a transplant at any time during this period (OCT-NOV 2003)					0.79	96.7%	-0.03	86.7%
20B	Was patient on hemodialysis or did patient receive a transplant at any time during this period (DEC 2003 - JAN 2004)					0.65	96.7%	-0.05	90.0%
20B	Was patient on hemodialysis or did patient receive a transplant at any time during this period (FEB-MAR 2004)					0.63	93.3%	0.26	86.7%
21	Was adequacy measurement done during OCT 2003 - MAR 2004 (Will be NO if measurement was not done)					0.84	96.7%	0.28	70.0%
21A	Date of first adequacy measurement between 10-1-2003 to 3-31-2004	29	96.7%	20	66.7%				
21B	Patient's dialysis modality when adequacy measures were performed					0.87	93.3%	0.38	60.0%
21C	Patient's weight at time of adequacy measurement (abdomen empty)	20	66.7%	16	53.3%				
21C	Unit of measure used for adequacy weight					0.41	80.0%		66.7%
21D	Weekly Kt/V urea (dialysate and urine clearance)	26	86.7%	19	63.3%				
21E	Method by which V was calculated					0.66	76.7%	0.35	53.3%
21E	Other method to calculate V						86.7%		43.3%
21F	Weekly creatinine clearance (dialysate and urine clearance)	24	80.0%	19	63.3%				
21G	Is this creatinine clearance corrected for body surface area, using standard methods					0.64	83.3%	0.48	70.0%
21H	24 hr dialysate volume (prescribed and ultrafiltration)	19	63.3%	8	26.7%				
21I	24 hr dialysate urea nitrogen	25	83.3%	18	60.0%				
21J	24 hr dialysate creatinine	24	80.0%	17	56.7%				

21K	24 hr urine volume	27	90.0%	22	73.3%				
21K	Indicator if 24 urine was not collected					0.71	90.0%	0.51	80.0%
21L	24 hr urine urea nitrogen	26	86.7%	20	66.7%				
21M	24 hr urine creatinine	28	93.3%	22	73.3%				
21N	Serum BUN at the time this adequacy assessment was done	28	93.3%	20	66.7%				
21O	Serum creatinine at the time this adequacy assessment was done	27	90.0%	20	66.7%				
21P1	Most recent four hour dialysate/plasma creatinine ratio (D/Pcr) from a peritoneal equilibration test (PET)	23	76.7%	20	66.7%				
21P2	Date of most recent (D/Pcr)	22	73.3%	20	66.7%				
22A1	Number of dialysis days per week (prior prescription 1)	29	96.7%	22	73.3%				
22A2	Total dialysate volume infused per 24 hrs (prior CAPD prescription 1)	27	90.0%	21	70.0%				
22A3	Total number of exchanges per 24 hrs, including overnight exchange (prior CAPD prescription 1)	29	96.7%	21	70.0%				
22B1	Number of dialysis days per week (prior CYCLER prescription 1)	28	93.3%	20	66.7%				
22B2	Total dialysate volume infused per 24 hrs (prior CYCLER prescription 1)	24	80.0%	16	53.3%				
22B3a	Total nighttime dialysis time (hours) (prior CYCLER prescription 1)	25	83.3%	19	63.3%				
22B3a	Total nighttime dialysis time (minutes) (prior CYCLER prescription 1)	23	76.7%	16	53.3%				
22B3b	Total daytime dialysis time (hours) (prior CYCLER prescription 1)	24	80.0%	11	36.7%				
22B3b	Total daytime dialysis time (minutes) (prior CYCLER prescription 1)	23	76.7%	15	50.0%				
22B3c	Total amount of time the patient is dry during 24 hours (hours) (prior prescription 1)	23	76.7%	12	40.0%				

22B3c	Total amount of time the patient is dry during 24 hours (minutes) (prior prescription 1)	24	80.0%	14	46.7%				
22B4a	Volume of a single nighttime exchange (prior CYCLER prescription 1)	25	83.3%	19	63.3%				
22B4b	Number of dialysis exchanges during the nighttime (prior CYCLER prescription 1)	23	76.7%	14	46.7%				
22B5a	Volume of a single daytime exchange (prior CYCLER prescription 1)	25	83.3%	16	53.3%				
22B5b	Number of dialysis exchanges during the daytime (prior CYCLER prescription 1)	25	83.3%	14	46.7%				
22B6	Does the prescription include TIDAL dialysis (prior prescription 1)					0.66	80.0%	0.00	33.3%
22C1	Was the collection repeated (prior prescription 1)					0.56	76.7%	0.38	60.0%
22C2	Was the prescription changed (prior prescription 1)					0.65	80.0%	0.04	16.7%
23	Was SECOND adequacy measurement done during NOV 2003 - MAR 2004					0.94	96.7%	0.24	43.3%
23A	Date of second adequacy measurement between 11-1-2003 to 3-31-2004	28	93.3%	22	73.3%				
23B	Patient's dialysis modality when adequacy measures were performed					0.89	93.3%	0.53	73.3%
23C	Patient's weight at time of adequacy measurement (abdomen empty)	23	76.7%	17	56.7%				
23C	Unit of measure used for adequacy weight					0.77	86.7%		70.0%
23D	Weekly Kt/V urea (dialysate and urine clearance)	26	86.7%	21	70.0%				
23E	Method by which V was calculated					0.60	73.3%	0.35	60.0%
23E	Other method to calculate V						86.7%		90.0%
23F	Weekly creatinine clearance (dialysate and urine clearance)	24	80.0%	20	66.7%				

23G	Is this creatinine clearance corrected for body surface area, using standard methods					0.78	86.7%	0.53	73.3%
23H	24 hr dialysate volume (prescribed and ultrafiltration)	24	80.0%	16	53.3%				
23I	24 hr dialysate urea nitrogen	26	86.7%	22	73.3%				
23J	24 hr dialysate creatinine	24	80.0%	19	63.3%				
23K	24 hr urine volume	26	86.7%	25	83.3%				
23K	Indicator if 24 urine was not collected						100.0%		100.0%
23L	24 hr urine urea nitrogen	25	83.3%	24	80.0%				
23M	24 hr urine creatinine	25	83.3%	23	76.7%				
23N	Serum BUN at the time this adequacy assessment was done	28	93.3%	22	73.3%				
23O	Serum creatinine at the time this adequacy assessment was done	28	93.3%	21	70.0%				
23P1	Most recent four hour dialysate/plasma creatinine ratio (D/Pcr) from a peritoneal equilibration test (PET)	23	76.7%	25	83.3%				
23P2	Date of most recent (D/Pcr)	23	76.7%	25	83.3%				
24A1	Number of dialysis days per week (prior prescription 2)	29	96.7%	23	76.7%				
24A2	Total dialysate volume infused per 24 hrs (prior CAPD prescription 2)	28	93.3%	24	80.0%				
24A3	Total number of exchanges per 24 hrs, including overnight exchange (prior CAPD prescription 2)	28	93.3%	24	80.0%				
24B1	Number of dialysis days per week (prior CYCLER prescription 1)	28	93.3%	24	80.0%				
24B2	Total dialysate volume infused per 24 hrs (prior CYCLER prescription 2)	24	80.0%	19	63.3%				
24B3a	Total nighttime dialysis time (hours) (prior CYCLER prescription 2)	25	83.3%	22	73.3%				
24b3a	Total nighttime dialysis time (minutes) (prior CYCLER prescription 2)	24	80.0%	20	66.7%				
24b3b	Total daytime dialysis time (hours) (prior CYCLER prescription 2)	23	76.7%	18	60.0%				

24b3b	Total daytime dialysis time (minutes) (prior CYCLER prescription 2)	25	83.3%	21	70.0%				
24b3c	Total amount of time the patient is dry during 24 hours (hours) (prior prescription 2)	23	76.7%	19	63.3%				
24b3c	Total amount of time the patient is dry during 24 hours (minutes) (prior prescription 2)	25	83.3%	20	66.7%				
24B4a	Volume of a single nighttime exchange (prior CYCLER prescription 2)	25	83.3%	21	70.0%				
24B4b	Number of dialysis exchanges during the nighttime (prior CYCLER prescription 2)	25	83.3%	22	73.3%				
24B5a	Volume of a single daytime exchange (prior CYCLER prescription 2)	25	83.3%	21	70.0%				
24B5b	Number of dialysis exchanges during the daytime (prior CYCLER prescription 2)	26	86.7%	21	70.0%				
24B6	Does the prescription include TIDAL dialysis (prior prescription 2)					0.68	83.3%	0.00	60.0%
24C1	Was the collection repeated (prior prescription 2)					0.84	90.0%	0.53	70.0%
24C2	Was the prescription changed (prior prescription 2)					0.88	93.3%	0.13	53.3%