I love people who harness themselves, an ox to a heavy cart, who pull like water buffalo, with massive patience, who strain in the mud and the muck to move things forward, who do what has to be done, again and again.

MARGE PIERCY
“TO BE OF USE”
The growing number of patients with ESRD has led to increasing decentralization of the dialysis delivery system—once limited to major medical centers, and now spread to suburban and more rural communities. Restrictive reimbursement systems, in which only minor increases have occurred since 1982, have led to major consolidations in the ESRD provider networks.

Although this report centers on data through the end of 2003, the months since December of 2004 have brought continued consolidation of the dialysis chains into two large providers, both for-profit, publicly-traded corporations. Recent changes such as this are illustrated in Figure 10.1, which shows the continued growth of freestanding, for-profit dialysis units in the United States, with slight declines in the number of non-profit and hospital-based providers.

Characteristics of the dialysis population across this large provider system have been the focus of this chapter for many years. In this year's first spread, we present information on provider-level anemia at initiation, treatment with erythropoietin in the prevalent population, and the variation in the erythropoietin doses based on achieved hemoglobin groups and iron therapy.

At the initiation of hemodialysis, units owned by Dialysis Clinics, Inc. and National Nephrology Associates have the greatest percentage of patients with hemoglobin levels less than 11 g/dl. Across all hemoglobin levels, however, the highest EPO doses are given by DaVita. Data on EPO doses and hemoglobin levels by unit affiliation show the considerable variation across providers in the last six months of 2003. Clear in these data is the fact that the high EPO doses used by DaVita moved patients from hemoglobin levels less than 11 g/dl in June, 2003, to hemoglobins of at least 12 g/dl within three months, a level which then stabilized.

Geographic variations in hemoglobin levels vary by profit status, as do variations in the percent of patients receiving intravenous iron. These differences in provider practices suggest that there is less consistent application of the target guidelines for treatment, something which needs careful consideration when addressing the cost-effectiveness of these interventions.

Data on provider growth show a striking decline in the use of peritoneal dialysis across ESRD networks. This is particularly true in Networks 1, 2, 4, 9, and 10. Only in Network 6 did the number of peritoneal dialysis treatments increase between 1999 and 2003. Interestingly, non-chain affiliated units dominate Network 2, which has seen the steepest decline in peritoneal dialysis treatments.

Data on the demographic characteristics of the incident population show that the distribution of patients by age and gender is similar in the top 4–5 chains. The same is true for other...
demographic characteristics, though hospital-based units have the highest percentage of patients with high albumin levels.

We look next at provider compliance with guidelines for care advanced by K/DOQI. DaVita, for example, has the greatest percentage of patients with an average hemoglobin of 12 g/dl or more throughout the year, while Dialysis Clinics, Inc. has the greatest percentage whose hemoglobins meet the K/DOQI target of 11–12 g/dl. Once again, there is considerable geographic variation in mean hemoglobin levels of patients treated in chain versus non-chain units, as well as in associated EPO dosing patterns. Vascular access use appears to be similar across providers, with catheter use highest in hospital-based units. Use of an internal access does, however, vary across the country by chain and non-chain status. And interestingly, albumin, creatinine, and hemoglobin levels in patients beginning ESRD therapy vary little by provider.

The final spread in this chapter addresses preventive care. Influenza, pneumococcal pneumonia, and hepatitis B vaccination rates have changed considerably over the years, and have now reached a degree of stability. Chains have tended to vaccinate a greater percentage of patients for influenza and for pneumonia than have non-chain units. It is interesting to note that the 2002–2003 rate of pneumococcal pneumonia vaccinations in units owned by Renal Care Group far outpaces that seen in other providers.

Diabetic care also varies considerably across providers. Lipid testing in diabetic patients, for example, appears to be used least in units owned by Renal Care Group and Dialysis Clinics, Inc., while recommended testing of hemoglobin A1C levels is given most often in DaVita units.

The quality of care given to the dialysis population differs between providers, particularly between the chain-affiliated units and their non-chain or hospital-based counterparts. Although the Clinical Performance Measures program of the Centers for Medicare and Medicaid Services has focused primarily on dialysis delivery, anemia treatment, and vascular access, other aspects of care are clearly a concern well. The largest dialysis provider groups show considerable room for improvement. These areas and others will be explored further in subsequent Annual Data Reports to help us better assess provider performance.
Across dialysis providers, hemoglobin levels average less than 11 g/dl in 23 percent of units, 11–<12 g/dl in 33 percent, and 12 g/dl or higher in 44 percent (Figure 10.2). The target set by NKF’s Kidney Dialysis Outcomes Quality Initiative (K/DOQI) is a hemoglobin of 11 g/dl or greater. Levels are highest in DaVita and Renal Care Group units, at 12 g/dl or greater in 48–50 percent of units, and lowest in facilities owned by Dialysis Clinics Incorporated or National Nephrology Associates—in 27 and 38 percent of these units, respectively, hemoglobin levels average less than 11 g/dl.

Hemoglobin levels vary less by unit type (Figure 10.3). Regardless of profit status or hospital-based/freestanding status, average hemoglobin levels are less than 11 g/dl in 23–24 percent of units. The percent of units in which levels are 12 g/dl or greater is slightly higher in for-profit units compared to non-profit units—44.2 and 40.6, respectively—but is the same in freestanding and hospital-based units.

EPO dosing practices appear to vary by unit affiliation, with chain-affiliated units tending to give higher doses of EPO to patients with hemoglobins less than 11 g/dl. Chain units, for example, have a greater proportion of patients (4–14 percent) with hemoglobins less than 10 g/dl in the top quartile of EPO dose compared to non-chain units; DaVita has the largest proportion of patients in the top quartile of EPO dosing for all hemoglobin levels.

Assessment of anemia treatment over a six-month period shows similar patterns (Figure 10.5). Chain units again tend to give the highest amount of EPO to patients whose hemoglobins fall below 11 g/dl. In patients with hemoglobins above 12 g/dl, differences in dosing patterns are much less apparent. Mean hemoglobins in the less than 11 g/dl group rise in the early months of treatment and then plateau, in contrast to those in the greater than 12 g/dl group, where slight decreases occur in the initial months followed by a stable pattern.

Geographic variations in mean weekly EPO dose by profit status show only slight differences between for-profit and non-profit units (Figure 10.6). In patients with hemoglobins of 12 g/dl or greater, for example, the mean EPO dose in the top quintile of non-profit units is less than 7 percent higher than the mean dose in for-profit units.

It appears that iron therapy is used in some degree by all unit types to supplement the positive effects of EPO (Figures 10.7–8). NNA tends to give the largest amounts of iron in both hemoglobin groups and, with DaVita (Figure 10.5), the highest EPO doses to patients with hemoglobins less than 11 g/dl. Geographic comparisons indicate that patients in for-profit units who have hemoglobins of 12 g/dl or greater are more likely to receive iron than those in non-profit units; mean percentages in the lower quintile differ by more than 16 percent.
10.5 Anemia treatment & hemoglobin levels, by unit affiliation

<table>
<thead>
<tr>
<th>Unit Affiliation</th>
<th>June hgb &lt;11 g/dl</th>
<th>June hgb &gt;12 g/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresenius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gambro</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DaVita</td>
<td></td>
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<tr>
<td>RCG</td>
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<td></td>
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<tr>
<td>DCI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nat’l Neph. Assoc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-chain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital-based</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.6 Geographic variations in provider-level mean weekly EPO dose, by state

10.7 Patients receiving iron therapy, by hemoglobin level & unit affiliation

10.8 Geographic variations in the percent of patients receiving iron, by state

[Figures 10.2–3] providers of period prevalent hemodialysis patients who have at least three months of dialysis prior to June, 2003, a valid EPO claim in June, 2003, & an identifiable provider. (Figure 10.4) period prevalent hemodialysis patients who have at least three months of dialysis prior to June 2003, a valid EPO claim in June & July of 2003, & an identifiable provider. Hemoglobin groups are determined from June claims, & EPO doses from July claims. (Figures 10.5–8) period prevalent hemodialysis patients who have at least three months of dialysis prior to June 2003, a valid EPO claim in June 2003, & an identifiable provider; who dialyze at the same provider from June–December 2003 & have a valid EPO claim in each of those months; & who are from a provider with at least ten such patients.
The total number of in-center hemodialysis treatments increased 24.3 percent between 1999 and 2003—from 33 to 41 million (Figure 10.9). Growth ranged from 15.3 percent in Network 4 (Delaware and Pennsylvania) to nearly 33 percent in Network 9 (Indiana, Kentucky, and Ohio). The number of peritoneal dialysis treatments varies widely from year to year; 122,378 patients were reported to be on this therapy in 2003.

Provider growth between 1999 and 2003 was higher for units with chain affiliation than for non-chain units (Figure 10.10). During this period, 139 units were dropped from chain status and 758 units were added, a net gain of 619 units. Conversely, 411 units were dropped from non-chain status and 526 were added, a net gain of 115, demonstrating a continued trend towards private ownership within renal providers.

In Network 6—Alaska, Idaho, Montana, Oregon, and Washington—the proportion of units that are chain-affiliated rose from 17 percent in 1999 to 49 percent in 2003 (Figure 10.11), the most dramatic concentration of dialysis units is seen in the eastern states—California having more than 80 percent of units comprising many of the southern states and Network 18 in California—more than 80 percent of units operate on a for-profit basis, while in Network 2, nearly 60 percent remain non-profit.

Not surprisingly, the highest concentration of dialysis units is seen in the east-
ern half of the country (Figure 10.13). Areas along the Gulf Coast and eastern seaboard have more than twice the number of dialysis units per 100,000 population as some areas in the western third of the nation.

Eighty-two percent of dialysis units in the U.S. are now freestanding, up 4 percent from 1999 (Figure 10.17). By renal network, the distribution of units parallels that seen with profit status. In Networks 6, 7, and 8, more than 90 percent of all units are freestanding; in Network 2, in contrast, nearly half of the units are hospital-based.

{Figures 10.9–17} Data obtained from the CMS annual End-Stage Renal Disease Facility Survey, CMS Independent Renal Facility Cost Reports, & the CMS "Dialysis Facility Compare" website. [Figure 10.15] 2003, by HSA, unadjusted. – For Figure 10.17, data also obtained from estimates of the United States 2003 census, based on the 2000 census. – For Figure 10.9

Transient treatments, which account for less than 1 percent of all treatments, are not included. Hemodialysis includes outpatient hemodialysis & hemodialysis training treatments; peritoneal dialysis includes outpatient IPD treatments & IPD, CAPD, & CCPD training treatments. Figure 2.39, in Chapter Two, contains a map of the ESRD networks; a list of network contacts can be found on page 230 of Appendix A.
Characteristics of incident dialysis patients, by unit affiliation, 2003 incident dialysis patients

10.18

- **Gender:** Female
- **Race:**
  - Other/unknown
  - Asian
  - Native American
  - Black
  - White
- **Diabetic status:** Diabetics
- **Primary diagnosis:**
  - Other/unknown
  - Cystic kidney
  - Glomerulonephritis
  - Hypertension
  - Diabetes
- **Modality:**
  - Peritoneal dialysis
  - Hemodialysis
- **Mean hemoglobin at initiation:**
  - Hemoglobin (g/dL)
  - Hemodialysis: 10.2
  - Peritoneal dialysis: 10.0
  - Total: 9.8
- **Percent receiving EPO at initiation:**
  - Percent of patients
- **Percent with albumin < test's lower limit:**
  - Percent of patients
- **Mean BMI at initiation:**
  - BMI (kg/m²)
  - All: 29
  - 1: 28
  - 2: 27
  - 3: 26
  - 4: 25
  - 5: 24
  - 6: 23
  - NC: 22
  - HB: 21
  - U: 20
- **Mean eGFR at initiation:**
  - eGFR (mL/min/1.73 m²)
  - All: 11.0
  - 1: 10.5
  - 2: 10.0
  - 3: 9.5
  - 4: 9.0
  - 5: 8.5
  - 6: 8.0
  - NC: 7.5
  - HB: 7.0
  - U: 6.5

Unit affiliation (see table at right for codes)
The mean age of the incident dialysis population is now 62.6, and is slightly higher in units that are owned by National Nephrology Associates or are not chain-affiliated (Figure 10.18). Forty-two percent of patients treated in hospital-based units are female, compared to 46 percent overall. Differences in the distribution of patients by race and ethnicity are not dramatic; DaVita does, however, have the greatest proportion of Hispanic patients, at 17.5 percent of its population, compared to only 4.3 percent in units owned by DCI.

Patients receiving therapy in units owned by Fresenius or Gambro have a mean hemoglobin at initiation that is just slightly lower than the overall average of 10.1 g/dl, while for those in DaVita and RCG units it is slightly higher; these levels do not seem related to the use of EPO prior to initiation. The percent of patients who begin therapy with an albumin lower than the test’s lower limit ranges from 57.6 in units owned by RCG to 67.7 in hospital-based facilities. Mean BMIs and estimated GFRs at initiation are similar across chains, with an overall average of 27.7 kg/m² and 9.8 ml/min/1.73 m², respectively.

Growth in most dialysis chains has been quite aggressive since 1999 (Figure 10.19). Fresenius, for example, has seen an increase of 36 percent in the number of both units and patients; at Renal Care Group, growth has reached 65–70 percent. The number of non-chain dialysis units has risen 19 percent since 1999; there has been a slight fall, however, in the number of hospital-based units, accompanied by a decrease of nearly 10 percent in the number of patients treated in these units.

Prevalent dialysis patients tend to be slightly younger than patients starting therapy, with a mean age of 60.4 (Figure 10.20). Across unit affiliations, diabetics account for 40–43 percent of the population, and patient distribution by primary diagnosis varies little.

As noted in Chapter Four, corporate acquisitions in late 2004 and the spring of 2005 will bring significant change to this picture of the dialysis population. The use of peritoneal dialysis, for example, is likely to decline, as Gambro and Renal Care Group—chains with some of the greatest use of this therapy—have now been acquired by chains more likely to place their patients on hemodialysis.

(Figures 10.18–19) incident dialysis patients, 2005. Facility data obtained from the CMS annual End-Stage Renal Disease Facility Survey, the CMS Independent Renal Facility Cost Reports, & the CMS “Dialysis Facility Compare” website. The lower limit of albumins measured by bromcresol purple is 3.2 g/dl, & by bromcresol green is 3.5 g/dl. [Figure 10.20] December 31 point prevalent dialysis patients, 2005. Facility data obtained from the CMS annual End-Stage Renal Disease Facility Survey, the CMS Independent Renal Facility Cost Reports, & the CMS “Dialysis Facility Compare” website.
10.21 Anemia treatment & dialysis adequacy, by unit affiliation, 2003

- Hemoglobin (g/dl): hemodialysis
  - 12+
  - 11-12
  - 10-11
  - 9-10
  - <9

- Median URR (%): hemodialysis
  - 75+
  - 70-75
  - 65-70
  - 60-65
  - <60

- EPO dose (units): hemodialysis
  - 23,000+
  - 16,000-23,000
  - 11,000-16,000
  - 7,000-11,000
  - <7,000

- Mean weekly Kt/V: peritoneal dialysis
  - 95.1 + (98.3)
  - 91.3 to <95.
  - 88.3 to <91.
  - 83.3 to <88.
  - below 83.3 (80.8)

- Median URR (%): peritoneal dialysis
  - 95.1 + (99.1)
  - 91.3 to <95.
  - 88.3 to <91.
  - 83.3 to <88.
  - below 83.3 (75.9)

- Mean weekly Kt/V: hemodialysis
  - 11.93 + (12.04)
  - 11.82 to <11.93
  - 11.76 to <11.82
  - 11.69 to <11.76
  - below 11.69 (11.63)

- Mean EPO dose: hemodialysis
  - 18.2 + (19.2)
  - 17.3 to <18.2
  - 16.2 to <17.3
  - 14.3 to <16.2
  - below 14.3 (13.1)

- Mean EPO dose: peritoneal dialysis
  - 18.2 + (20.1)
  - 17.3 to <18.2
  - 16.2 to <17.3
  - 14.3 to <16.2
  - below 14.3 (11.9)

10.22 Percent of patients meeting target URR level, by chain status & state, 2003

Chain

Non-chain

10.23 Geographic variations in anemia treatment, by chain status & state, 2003

Mean hemoglobin: chain

Mean hemoglobin: non-chain

Mean EPO dose: chain

Mean EPO dose: non-chain
The proportion of hemodialysis patients with an average hemoglobin at or above 11 g/dl—the target set by K/DOQI—ranges from 83 percent in units owned by Dialysis Clinics Inc. to 91 percent in those owned by DaVita (Figure 10.21). Nearly six in ten patients treated in DaVita units have a mean hemoglobin of 12 g/dl or higher. Mean weekly EPO doses of 16,000 units or more are received by 36 percent of patients treated in non-chain or hospital-based units, compared to a high of 45 percent in DaVita units.

The K/DOQI target for the median urea reduction ratio in hemodialysis patients is 65 percent or higher—a target set, in patients tracked in the CPM dataset, by 88 percent of patients overall, and by 92 percent of those treated in units owned by Renal Care Group or National Nephrology Associates.

Geographic variations in the percent of patients meeting the target URR level of 65 percent, along with differences in anemia treatment by unit affiliation, are depicted in Figures 10.22–23. Analyses by state indicate that therapy targets are reached in slightly more patients dialyzing in chain-affiliated units than in non-chain facilities. Across the nation, higher hemoglobins are more widespread in patients receiving care in chain-affiliated units, and such units located east of the Mississippi tend to give higher doses of EPO compared to their non-chain counterparts.

Guidelines of both K/DOQI and the HP2010 project recommend increased use of arteriovenous fistulas; the HP2010 goal is to have 50 percent of new patients using a fistula as their primary access. By unit affiliation, fistula use in prevalent hemodialysis patients is relatively consistent, ranging from 28 to 35 percent (Figure 10.24).

Geographic patterns showing the percent of patients with internal accesses indicate that overall use of this access is comparable between chain-affiliated and non-chain units (Figure 10.25). In regions represented by the upper-quintile, approximately 5 percent more non-chain patients have internal accesses compared to the upper-quintile patients in chain-affiliated units.

Fewer than one-third of incident dialysis patients begin therapy with an albumin level greater than the test’s lower limit; the proportion ranges from 27 percent in hospital-based units to 39 percent in those owned by Renal Care Group (Figure 10.26). Serum creatinine levels are less than 10 mg/dl in 82–89 percent of patients. And only 27–31 percent of new patients initiate treatment with a hemoglobin at or above the level of 11 g/dl recommended by K/DOQI.
Preventive care, by unit affiliation

### Influenza Vaccinations

**Figure 10.27** Patients receiving influenza vaccinations, by unit affiliation, 2003

- **Patients receiving influenza vaccinations, by unit affiliation, 2003**
  - **ESRD patients, 2003**

**Figure 10.28** Patients receiving influenza vaccinations, by chain status & year

- **Patients receiving influenza vaccinations, by chain status & year**
  - **ESRD patients**

### Hepatitis B Vaccinations

**Figure 10.31** Patients receiving hepatitis B vaccinations, by unit affiliation, 2003

- **Patients receiving hepatitis B vaccinations, by unit affiliation, 2003**
  - **ESRD patients, 2003**

**Figure 10.32** Probability of receiving a hepatitis B vaccination, by chain status, 2003

- **Probability of receiving a hepatitis B vaccination, by chain status, 2003**
  - **ESRD patients, 2003**

### Pneumococcal Pneumonia Vaccinations

**Figure 10.29** Patients receiving pneumococcal pneumonia vaccinations, by unit affiliation, 2002–2003

- **Patients receiving pneumococcal pneumonia vaccinations, by unit affiliation, 2002–2003**
  - **ESRD patients, 2002**

**Figure 10.30** Probability of receiving a pneumococcal pneumonia vaccination, by chain status, 2002–2003

- **Probability of receiving a pneumococcal pneumonia vaccination, by chain status, 2002–2003**
  - **ESRD pts, 2002**

Fifty-seven percent of patients receive an influenza vaccination; this rises to 65 percent in units owned by DaVita, and drops to 51 percent in hospital-based units (Figure 10.27). Patients in chain-owned units are more likely than those in non-chain units to receive this vaccination, at 64 and 55 percent, respectively. There is still considerable progress to be made before the HP2010 goal of a 90 percent influenza vaccination rate is met.

The rate of pneumococcal pneumonia vaccinations is only 13.6 percent overall, rising to 29 percent in units owned by Renal Care Group (RCG) (Figure 10.29). At the end of two years, the probability of being vaccinated is only 0.14 for patients in chain-owned units, and 0.12 in those treated by non-chain facilities (Figure 10.30).

The overall rate of hepatitis B vaccinations is 21 percent; 20 percent of patients in hospital-based units receive this vaccination, compared to 34 percent in Gambro units (Figure 10.31). After one year, the cumulative probability of being vaccinated is 0.26 and 0.22 for patients in chain-owned and non-chain units, respectively.

In the diabetic ESRD population, 44 percent of patients receive two or more lipid tests within a year (Figure 10.33). Only 17 percent of patients in RCG and DCI units meet this treatment guideline, compared to 80 percent of those receiving treatment in units owned by National Nephrology Associates (NNA). Clinical practices in these chains are illustrated as well by the cumulative probability of receiving a first lipid test, which reaches 0.74 in the first month for patients treated in NNA units (Figure 10.35). The percent of patients receiving at least one lipid test has grown since the early 1990s, and, since 1994–1995, has remained highest in units that are not chain-affiliated (Figure 10.34).
Differences in the fulfillment of guidelines for glycosylated hemoglobin testing are not as dramatic. Forty-two percent of diabetic patients overall receive the recommended four or more tests per year; by chain, rates range from 35 percent in hospital-based units to 58 percent in those owned by DaVita (Figure 10.36). Patients in units owned by NNA are again most likely to receive testing in chain-owned units (Figure 10.37). The percent of patients receiving an HbA1c test during the year has grown steadily over the last decade. In contrast to patterns seen with lipid testing, however, HbA1c testing rates have, since 2000–2001, been highest for patients receiving therapy in chain-owned units (Figure 10.38).

(All figures) patients with Medicare Parts A & B primary payer coverage during the entire period. (Figures 10.27–28) ESRD patients initiating therapy 90 days before September 1, 2002, & alive on December 31, 2003. Vaccinations tracked between September 1 & December 31 of each year. (Figure 10.29) point prevalent patients, 2002, with 90-day rule, alive on December 31, 2003. Vaccinations tracked in 2002 & 2003. (Figure 10.30) point prevalent patients, 2002, with 90-day rule. Vaccinations tracked in 2002 & 2003. (Figure 10.31) ESRD patients initiating therapy 90 days before January 1, 2003, & alive on December 31. Vaccinations tracked in 2003. (Figure 10.32) point prevalent patients, 2003, with 90-day rule. Vaccinations tracked in 2003. (Figures 10.33–34 & 10.36–37) point prevalent patients initiating ESRD 90 days prior to January 1 of the first year, age 18–75 on December 31 of the second year, & alive through the end of the second year, with diabetes as the primary cause of ESRD or a comorbidity on the Medical Evidence form, or with diabetes diagnosed during the first year. Testing tracked in the second year; tests are at least 30 days apart. (Figures 10.35 & 10.37) point prevalent patients, 2002, with 90-day rule, age 18–75 on December 31 of the second year, & alive through the end of 2002, with diabetes as the primary cause of ESRD or a comorbidity on the Medical Evidence form, or with diabetes diagnosed during the first year. Testing tracked in the second year; tests are at least 30 days apart. (Figures 10.35, 10.32, 10.35, & 10.38) patients censored at death, end of plan, loss to followup, & end of 2003.

Chain 1 · Fresenius
Chain 2 · Gambro
Chain 3 · DaVita
Chain 4 · Renal Care Group
Chain 5 · Dialysis Clinics, Inc.
Chain 6 · Nat’l Nephrology Assoc.
NC · Non-chain units
HB · Hospital-based units
Hemoglobin levels are highest in DaVita and RCG units, at 12 g/dl or greater in 48–50 percent of units, and lowest in facilities owned by DCI or National Nephrology Associates—in 27 and 38 percent of these units, respectively, hemoglobin levels average less than 11 g/dl. 

Chain units tend to give the highest amount of EPO to patients whose hemoglobins fall below 11 g/dl.

Geographic comparisons indicate that patients in for-profit units who have hemoglobins of 12 g/dl or greater are more likely to receive iron than those in non-profit units; mean percentages in the lower quintile differ by more than 16 percent.

The total number of in-center hemodialysis treatments increased 24.3 percent between 1999 and 2003—from 33 to 41 million. Growth ranged from 15.3 percent in Network 4 to nearly 33 percent in Network 9.

From 1999 to 2003, growth in the total number of both units and patients was 19.5 percent. More than three-quarters of patients are treated in freestanding, for-profit dialysis units, up from 65 percent in 1996.

Patients receiving therapy in units owned by Fresenius or Gambro have a mean hemoglobin at initiation that is just slightly lower than the overall average of 10.1 g/dl, while for those in DaVita and RCG units it is slightly higher; these levels do not seem related to the use of EPO prior to initiation.

Growth in most dialysis chains has been quite aggressive since 1999. Fresenius has seen an increase of 36 percent in the number of both units and patients; at RCG, growth has reached 65–70 percent.

Mean weekly EPO doses of 16,000 units or more are received by 36 percent of patients treated in non-chain or hospital-based units, compared to a high of 45 percent in DaVita units.

Fistula use in prevalent hemodialysis patients is relatively consistent across unit affiliations, ranging from 28 to 35 percent.

The proportion of incident dialysis patients who begin therapy with an albumin greater than the test’s lower limit ranges from 27 percent in hospital-based units to 39 percent in those owned by RCG.

Patients in chain-owned units are more likely than those in non-chain units to receive an influenza vaccination, at 64 and 55 percent, respectively.

In the diabetic ESRD population, 44 percent of patients receive two or more lipid tests within a year. Only 17 percent of patients in RCG and DCI units meet this treatment guideline, compared to 80 percent of those receiving treatment in units owned by NNA.

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