Chapter Ten
Providers

Those who fall in love with practice without science are like a sailor who enters a ship without helm or compass, and who never can be certain whither he is going.

Leonardo da Vinci
The dialysis provider network continues to transform dramatically. We illustrate major changes over the past decade, showing consolidations that have resulted in two large, for-profit chains which currently treat nearly 60 percent of the dialysis population. Most of these changes have been documented on the Medicare costs reports, while a few units announced as being owned by the larger chains have yet to provide final reports illustrating the transfer. Fresenius had almost 1,600 units in 2007, with more than 113,000 patients; close to 100,000 patients were treated in DaVita’s 1,326 units. Hospital-based operations now account for 810 units — down from 856 in 2002 — and treated approximately 40,000 patients in 2007. And Dialysis Clinic, Inc. (DCI) continues to grow, from 186 units in 2002 to 205 units in 2007; they now provide care to 12,700 patients. We present data on the length of time units have been under their current ownership, an issue influencing the policies and practices of individual units, as new owners imprint their own systems of care. Changes in ownership have altered the distribution of units by time owned, particularly in DaVita centers and in the relatively new small dialysis organizations (SDOs), arising out of the divestitures of the large operations created from the Fresenius/RCG and DaVita/Gambro mergers. Anemia management has recently received increased attention, with clinical trials showing adverse outcomes when hemoglobin levels are targeted to 13 g/dl and above. In 2007, DaVita had the greatest percentage of patients with a hemoglobin of 12–<13 g/dl, and DCI the lowest; DCI had the greatest percentage of patients with a hemoglobin of 10–<12 g/dl. The use of intravenous (IV) iron products to treat anemia varies across providers. DaVita and DCI almost exclusively use Venofer, while Fresenius appears to use Venofer and Ferrlecit equally. The total months of IV iron therapy in the first six months of ESRD increased slightly in 2007 across most providers, while the mean IV iron dose in this period rose most in DaVita units and least in units owned by Fresenius. Epoetin alpha’s ability to help patients avoid transfusions was the primary reason for its FDA approval in 1989, and there are now 20 years of experience in anemia management with erythropoiesis stimulating agents (ESAs) and iron replacement. Transfusion rates have generally fallen since 2002, except in hospital-based units. Provider management of bone and mineral disorders and of anemia requires a number of laboratory tests for monitoring. The composite rate payment system — a bundled payment for dialysis services and monthly laboratory tests — was introduced in 1982. Laboratory tests covered by the composite rate include one monthly calcium, phosphorus, and complete blood count. Guidelines of the National Kidney Foundation’s Kidney Disease Outcomes Quality Initiative (KDOQI) suggest quarterly monitoring of parathyroid hormone levels, while quarterly iron saturation and ferritin testing have been suggested for the monitoring of anemia treatment (KDOQI guidelines suggest monthly iron saturations for the initial three months of therapy). The ordering of extra tests beyond those included in the composite rate has grown dramatically across providers, possibly reflecting changes in medical
practice since the original composite rate was determined. This year we again assess preventive care services delivered by providers. Glycemic control testing in diabetic patients shows a relative increase, with 60 percent now receiving at least four glycosylated hemoglobin tests in a year, while the number of patients receiving four more more lipid tests shows a 28 percent relative increase, and nearly one in two patients receives two or more annual tests. There has been only a slight increase in influenza vaccinations since 2004. Just 63 percent of patients are vaccinated, far from the CDC target of 90 percent. Vaccinations against pneumococcal pneumonia have increased slightly since 2001, reaching 22 percent overall in 2006–2007. Variations in Medicare payments across provider groups are considerable, particularly in the areas of ESAs, IV iron, and IV vitamin D. Laboratory costs billed to Medicare are fairly consistent across providers with the exception of DCI, for which costs are lower by nearly one-third compared to other providers. For a number of years we have presented comparisons, by provider, of mortality and hospitalization ratios, and this year we again give comparisons by geographic region as well. Also, because of the recent consolidation of providers, we present outcomes across both larger groups and individual providers. Hospitalization ratios are very similar across the large groups, yet mortality ratios differ, particularly in hospital-based units. Of the large dialysis organizations, DCI has significantly lower mortality and hospitalization ratios than other providers. Ratios for small dialysis organizations are lower in the Pacific region. And for hospital-based units, both mortality and hospitalization ratios are greatest in the East South Central, South Atlantic, and West South Central regions. These differences have narrowed compared to prior years, an important change. We will continue to assess these relative outcomes between providers, and examine them over time to determine areas for improvement.

**Figure 10.1; see page 378 for analytical methods.** N’s show numbers on December 31, 2007. SD0: small dialysis organization.
Between 2002 and 2007, growth in the number of dialysis units was greatest in ESRD Networks 9, 10, and 14, at 29, 31, and 36 percent, respectively (see page 238 for a map of networks). In Network 2, in contrast, the number of units rose only 2.9 percent. Growth in the number of patients was highest in Networks 14 and 15, at 31 and 29 percent. See page 378 for analytical methods. *CMS Annual Facility Survey.*

Dialysis unit and patient counts rose 18 and 20 percent between 2002 and 2007. With its purchase of Gambro in 2005, DaVita experienced the largest growth — 162 percent in unit counts, and 142 percent in patient counts. The number of hospital-based units, in contrast, fell 5.4 percent, accompanied by a decline of 3.4 percent in treated patients. *CMS Annual Facility Survey.*

The percentage of units remaining under consistent ownership for five or more years fell from 65.3 in 2002 to 56.1 in 2007. DaVita’s rapid growth is illustrated by the increase in its units owned for shorter periods — in 2007, 38 percent had been owned for two years or less. Nearly 90 percent of hospital-based units, in contrast, have been under the same ownership for five or more years. *CMS Annual Facility Survey.*

Chain affiliation

All units F Fresenius G* DaVita/Gambro (Gambro units were purchased by DaVita in October, 2005) DV DaVita RCG* Renal Care Group (RCG units purchased by Fresenius during 2006) DCI Dialysis Clinic, Inc.

NNA National Nephrology Associates SDOs Small dialysis organizations (defined as 20–99 dialysis units; unit classification assigned by the USRDS, & not used prior to 2005) Ind Independent units HB Hospital-based units

*CMS Annual Facility Survey.*

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Fifty-one percent of prevalent patients in 2007 had an average hemoglobin for the year of 10–12 g/dl. By unit affiliation, this ranged from 41–42 percent in RCG and DaVita units to 58 percent in independent and hospital-based units, and 69 percent in units owned by DCI. Figure 10.5; see page 378 for analytical methods. Period prevalent dialysis patients.

In the 2007 point prevalent dialysis population, 58 percent of patients used Venofer for their iron therapy, and 26 percent were on Ferrlecit; less than 1 percent were treated with INFED. This varies, however, by unit affiliation. In independent units and those owned by Fresenius and RCG, 38–43 percent of patients were treated with Ferrlecit; in DCI and DaVita units, in contrast, 85–86 percent received Venofer.

During the first six months of dialysis, patients use IV iron for an average of 4.5 months. This does not vary widely across unit affiliation, with a low in 2007 of 4.4 months in small dialysis organizations and in independent and hospital-based units, and a high of 4.7 months in units owned by DaVita. The mean total IV iron dose in this six-month period has increased from 1,969 units in 2002 to 2,193 in 2007 — growth of 11.3 percent — and now ranges from 1,857 in hospital-based units to 2,360 in those operated by DaVita. Figures 10.6–8; see page 378 for analytical methods. Point prevalent dialysis patients (10.6); incident dialysis patients (10.7–8).

The overall percentage of prevalent dialysis patients receiving one or more transfusions fell slightly between 2002 and 2007, from 15.8 to 14.8. By unit affiliation, this percentage ranges from 12.8 in DaVita units to nearly 17 in independent and hospital-based units. Figure 10.9; see page 379 for analytical methods. Point prevalent dialysis patients.
Clinical monitoring in the first six months of dialysis

10 Calcium/phosphorus tests: probability of five or more billed tests in the first six months of dialysis

11 Ferritin tests: probability of five or more billed tests in the first six months of dialysis

12 Parathyroid hormone tests: probability of five or more billed tests in the first six months of dialysis

13 CBC tests: probability of five or more billed tests in the first six months of dialysis

14 Iron saturation tests: probability of five or more billed tests in the first six months of dialysis

15 Prothrombin tests: probability of five or more billed tests in the first six months of dialysis

Monthly calcium, phosphorus, and complete blood count (CBC) tests are included in the dialysis composite rate. Serum ferritin tests can be drawn quarterly without medical justification, and parathyroid hormone tests are separately reimburseable. Figures here show the probability of five or more billed tests in the first six months of dialysis. For 2007 incident hemodialysis patients, for example, the probability of five or more billed ferritin tests in the first six months of dialysis reached 0.42 in small dialysis organizations (SDOs), 0.33 in Fresenius units, and 0.28 in those owned by DaVita. Figures 10.10–15; see page 379 for analytical methods. Incident hemodialysis patients.

Chain affiliation

All All units. F Fresenius. G* DaVita/Gambro (Gambro units were purchased by DaVita in October, 2005). DV DaVita. RCG Renal Care Group (RCG units purchased by Fresenius during 2006). DCI Dialysis Clinic, Inc. NNA National Nephrology Associates. SDOs Small dialysis organizations (defined as 20–99 dialysis units; unit classification assigned by the USRDS, & not used prior to 2005). Ind Independent units. HB Hospital-based units.
Sixty percent of dialysis patients age 67–75 and with diabetes receive four or more glycosylated hemoglobin (A1c) tests, ranging from 48 percent in hospital-based units to 65 percent in those independently owned. Fifteen percent of Fresenius patients, in contrast, and 25 percent of those in hospital-based units, receive no A1c testing. More than one in four patients receive no lipid testing; this rises to nearly 59 percent in DCI units. And 53 percent of patients have no annual diabetic eye examination; this ranges from 50 percent in units owned by SDOs to 56 percent in DCI units. Figures 10.16–18; see page 379 for analytical methods. Point prevalent dialysis patients with diabetes, age 67–75.

Influenza vaccination rates in 2007 ranged from 57 percent of patients treated in hospital-based units to almost 70 percent of those in units owned by DCI; the overall rate was 63 percent, up from 59 percent in 2004. With an overall rate of 21 percent, pneumococcal pneumonia vaccination rates in 2006–2007 ranged from 14 percent in small dialysis organizations to 27 percent in DaVita units. Twenty-six percent of patients received hepatitis B vaccinations in 2007, down slightly from 2004, and varying from 23 percent in DCI and hospital-based units to 29 percent in those owned by Fresenius. Figures 10.19–21; see page 379 for analytical methods. Point prevalent dialysis patients.
After an 8.5 percent growth in 2006, per person per month (PPPM) dialysis costs rose just 2.3 percent in 2007, to $1,448. Costs for laboratory services rose 3.9 percent (after a 3.3 percent increase the previous year), to $139. PPPM costs for erythropoiesis stimulating agents (ESAs) and other injectables, in contrast, fell 4.3 and 8.0 percent, respectively, to $515 and $16.

By unit affiliation, PPPM dialysis costs in 2007 ranged from $1,366 in DCI units to $1,469 in the small dialysis organizations (SDOs), while ESA costs were lowest in hospital-based units, at $462, and highest in units owned by DaVita, at $548. DaVita units also had the highest PPPM costs for both IV iron and IV vitamin D hormone, at $67 and $120, respectively. Costs for other injectables, in contrast, are relatively consistent across most providers, at $13–16, but rise to $29 in hospital-based units. And laboratory costs range from $96 in DCI units to $146 in independent units and those owned by SDOs. **Chain affiliation**

All units: F Fresenius, DV DaVita, DCE Dialysis Clinic, Inc., SDOs Small dialysis organizations (defined as 20–99 dialysis units; unit classification assigned by the USRDS) Ind Independent units HB Hospital-based units

**Figures 10.22–23:** see page 379 for analytical methods. *Period prevalent dialysis patients.*
Per person per month (PPPM) costs for interventions & preventive care, by unit affiliation, 2007

Per person per month costs for preventive care, by unit affiliation, 2007:

- **A1c testing**
  - DCI units: $2.06
  - Ind. units: $2.77
  - Fresenius units: $2.93

- **Lipid testing**
  - DCI units: $0.71
  - Ind. units: $0.93
  - Fresenius units: $0.93

- **Diabetic eye examination**
  - DCI units: $6.45
  - Ind. units: $8.95
  - Fresenius units: $8.95

- **Comprehensive diabetic monitoring**
  - DCI units: $1.08
  - Ind. units: $5.05
  - Fresenius units: $5.05

- **Influenza vaccinations**
  - DaVita units: $0.56
  - Fresenius units: $1.23

- **Pneumococcal pneumonia vaccinations**
  - DCI units: $0.24
  - Fresenius units: $0.30

Per person per month (PPPM) costs in 2007 for both glycosylated hemoglobin (A1c) testing and lipid testing were lowest in DCI units, at $2.06 and $0.71, respectively, and highest in independently owned units, at $2.77 and $2.93. Patients in DCI units also had the lowest PPPM costs for diabetic eye examinations and comprehensive diabetic monitoring, at $6.45 and $1.08, while the greatest costs for both types of preventive care — $8.95 and $5.05 — were found in units owned by small dialysis organizations. PPPM costs for influenza vaccinations ranged from $0.56 in DaVita units to $1.23 in those owned by Fresenius, while costs for pneumococcal pneumonia vaccinations varied less across providers, from $0.24 in DCI units to $0.30 in Fresenius units. Figure 10.24; see page 379 for analytical methods. Period prevalent dialysis patients. Comprehensive diabetic monitoring includes at least four A1c tests per year, at least two lipid tests per year, & at least one diabetic eye examination per year.
**Chain affiliation**

All All units  
LDOs Large dialysis organizations (defined as 100+ units; unit classification assigned by the USRDS)  
SDOs Small dialysis organizations (defined as 20–99 dialysis units; unit classification assigned by the USRDS)  
Ind Independent units  
HB Hospital-based units  
F Fresenius  
DV DaVita  
DCI Dialysis Clinic, Inc.

**Reading the grids**

Ratios are of column to row. In Figure 10.32, for example, the number 1.009 in column MA & row Pac is the SMR for the Mid-Atlantic division divided by the SMA for the Pacific division.

Numbers on the diagonal show each provider’s SMR or SHR for the year, with the national mortality or hospitalization rate as the reference.
This year we again present breakdowns of standardized hospitalization and mortality ratios (SHRs and SMRs) by geographic region and by large versus small dialysis organizations (LDOs and SDOs). For 2007, SDOs have slightly lower hospitalization and mortality ratios than LDOs, while independent facilities have a higher hospitalization ratio, and hospital-based facilities have a lower one. By chain, DCI again has the lowest hospitalization and mortality ratios.

Within the SDOs, five census divisions (East North Central, Middle Atlantic, South Atlantic, West North Central, and West South Central) have statistically significant higher hospitalization ratios, and only the Pacific division has a statistically significant lower hospitalization ratio. This division also has the only mortality ratio that is less than one and statistically significant. Among hospital-based facilities, the Mountain and Pacific divisions stand out as having lower hospitalization ratios, while the East North Central, East South Central, South Atlantic, and West South Central divisions all have higher hospitalization and mortality ratios. Figures 10.25–32; see page 379 for analytical methods. January 1 point prevalent hemodialysis patients with Medicare as primary payor (SHRs); January 1 point prevalent hemodialysis patients (SMRs).
Between 2002 & 2007, the number of dialysis **UNITS** rose 18%; the number of dialysis **PATIENTS** increased 20%. • 10.3

In 2007, 56.1% of units had been under consistent **OWNERSHIP** for 5 or more years, down from 65.3% in 2002. • 10.4

In DCI units in 2007, 69% of patients had an average **HEMOGLOBIN** for the year of 10–12 g/dl, compared to 41–42% in RCG & DaVita units. • 10.5

The overall number of months with IV **IRON** in the first six months of dialysis has increased from 4.1 in 2002 to 4.5 in 2007. • 10.7

Of patients with diabetes, 13% in DaVita units, & 25% of those in hospital-based units, receive **NO A1C TESTING**. • 10.16

Four in ten diabetic patients treated in DCI units receive **NO LIPID TESTING**. • 10.17

Seventy percent of DCI patients are vaccinated against **INFLUENZA**. • 10.19

Per person per month dialysis costs rose 2.3% in 2007, reaching **$1,448**. PPPM costs for erythropoiesis stimulating agents fell 4.3%, to **$515**. • 10.22

In 2007, **SMA LL DIALYSIS ORGANIZATIONS** had slightly lower SMRS & SHRS than large dialysis organizations. • 10.25

**summary**