And what you thought you came for
Is only a shell, a husk of meaning
From which the purpose breaks only when it is fulfilled
If at all. Either you had no purpose
Or the purpose is beyond the end you figured
And is altered in fulfillment.

T.S. Eliot

“Little Gidding”
End-stage renal disease received special consideration in 1972 when Medicare entitlement was granted to ESRD patients, ensuring access to life-saving dialysis and kidney transplantation. This report covers information on the program through December 31, 2004, with descriptive data from the Medical Evidence form through June, 2005. The Précis presents basic statistics on the ESRD program, and provides information not only on new and prevalent patients but also on those who return to dialysis after a failed kidney transplant or after regaining function. The most striking aspects of the kidney disease burden are reflected in the size of the recognized populations and their associated costs in the next year (Figure p.1). Recognized CKD and ESRD patients account for 5.7 and 1.1 percent of the Medicare population, respectively. Twenty-one percent have diabetes, and 56.4 percent carry a diagnosis of hypertension. These populations are highly interactive, with CKD appearing to be a multiplier disease that increases morbidity and costs associated with diabetes and hypertension—themselves known risks for CKD. Patients with CKD account for 16.5 percent of Medicare costs in the year the disease is identified, and 11.1 percent in the next year. And CKD and ESRD patients together consume 23.7 percent of Medicare expenditures, making kidney disease an important issue for public policy considerations. Overall statistics on the ESRD population continue to show a flattening of incident rates, with only a 1.8 percent increase in the number of new patients between 2003 and 2004. Data suggest that increased use of ACE inhibitors and ARBs, better glycemic control in diabetic patients, and better control of blood pressure may each be contributing to the stabilization of these rates. Seven percent of incident dialysis patients in 2004 were returning after a failed kidney transplant or after recovering kidney function. Peritoneal dialysis accounted for 6.6 and 7.7 percent of the incident and prevalent dialysis populations, proportions that have continued to decline over the past decade from peaks of 12.7 and 14.9 percent. The number of kidney transplants reached a high of 16,905 in 2004, while the prevalent transplant population, at 136,136, has risen approximately 6 percent per year, despite continued growth in the number of dialysis patients on the transplant wait list. This year we show that clinical care of patients is progressing, yet there is still need for improvement. The percent of prevalent dialysis patients with a functioning fistula grew to 39 in 2003, approaching the target of 40 set by K/DOQI in 1997, and placement rates have continued to climb. Dialysis adequacy has reached a high, with URRs greater than 65 percent in almost nine of ten patients. And mean hemoglobin levels were 11.9 g/dl through June, 2005, with only 19.4 percent of patients having a single month’s hemoglobin less than 11 g/dl—the lowest number since epoetin was introduced in June, 1989. Still, however, low vaccination rates, insufficient preventive care in diabetics, and the overshooting of hemoglobin levels may be impeding progress in these areas. Twenty-two
Percent of patients with diabetes receive no HbA1c testing, and 33 percent no lipid testing, within a year. Data on therapeu-
tic interventions show growing use of ACE-Is, ARBs, beta block-
ers, and statins, but medication adherence remains a concern.

Overall hospitalization rates have changed little in the last
decade, but this stability masks dramatic changes in the rea-
sons patients are hospitalized. Vascular access hospitalizations
have fallen 26.8 percent, reflect-
ing the transition of care to out-
patient settings. There has been
a 23.2 percent increase, howev-
er, in infectious hospitalizations,
which appears to be associated
with the use of dialysis catheters.
And higher cardiovascular hospi-
talizations reflect increased pa-
tient comorbidity.

During the last 20 years, mortality rates for
incident patients have declined
across modalities, with five-year
survival rates improving as well. Prevalent death rates have also fallen, particularly
for patients with less than three years of treatment. In addition, data this year show a
continued fall in the overall adjusted prevalent death rate of hemodialysis patients, a
finding first noted in the 2003 data. Incident-based mortality rates continue to decline
for those on treatment for two or more years, but there is increasing concern over the
lack of progress in first-year death rates for patients treated with hemodialysis. Use
of dialysis catheters in the first year has been the primary contributor to this lack of
progress, but other elements of first-year care should be considered.

ESRD pro-
gram costs continue to grow, and now account for 6.8 percent of the Medicare bud-
get. The EGHP population pays more for ESRD care—almost $10,000 per person in the
month of initiation—and a far higher monthly dialysis rate. ESRD patients with EGHP
coverage provide additional revenue for providers, augmenting Medicare payments.

Costs for complex CKD patients with diabetes and hypertension are growing in
both the Medicare and EGHP populations. Older EGHP patients—usually retirees—
may have characteristics similar to those of the Medicare population, yet, as shown
in Chapter One, often receive less care. There also appear to be differences in access
to care by industry and among union and non-union employees. This may contribute
to the growing costs of care for retirees in EGHPs, and to the increased complexity of
the population reaching Medicare. Such data suggest that the entire healthcare sys-
tem should focus on improving the care of these at-risk populations, addressing the
HP2010 objectives and K/DOQI guidelines.
**Precis**

**Summary statistics on reported ESRD dialysis & transplant patients in the United States, 2004**

**Incidence**

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>December 31 point prevalence</th>
<th>Kidney transplants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Adj. Rate*</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–19</td>
<td>1,366</td>
<td>14</td>
</tr>
<tr>
<td>20–44</td>
<td>13,347</td>
<td>116</td>
</tr>
<tr>
<td>45–64</td>
<td>18,793</td>
<td>242</td>
</tr>
<tr>
<td>65–74</td>
<td>26,034</td>
<td>1,423</td>
</tr>
<tr>
<td>75+</td>
<td>26,671</td>
<td>1,679</td>
</tr>
<tr>
<td>Unknown</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

**Race/Hispanic**

| White                   | 67,787 | 263                         | 288,713| 1,133 | 186,528| 102,185|
| Black                   | 29,033  | 968                         | 149,063| 4,802 | 124,098| 24,965 |
| Native American         | 1,717   | 524                         | 6,282 | 2,648 | 4,100 | 1,372  |
| Asian/Pacific Islander  | 3,741   | 341                         | 20,504| 1,720 | 14,328| 6,176  |
| Other/unknown           | 2,659   |                             | 7,537 |       | 6,099 | 1,438  |
| Hispanic                | 13,533  | 485                         | 64,515 | 2,214 | 48,610| 15,905 |
| Non-Hispanic            | 90,831  | 329                         | 407,584| 1,408 | 287,353| 120,231|
| Male                    | 57,553  | 422                         | 262,288| 1,868 | 181,694| 80,594 |
| Female                  | 46,777  | 276                         | 209,773| 1,724 | 154,236| 55,357 |
| Unknown                  | 34      | 38                          | 7      |        | 5     | 2      |

**Diagnostic**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Count</th>
<th>Adj. Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>45,871</td>
<td>149</td>
</tr>
<tr>
<td>Hypertension</td>
<td>12,133</td>
<td>377</td>
</tr>
<tr>
<td>Other renal nephropathy</td>
<td>8,449</td>
<td>28</td>
</tr>
<tr>
<td>Cystic kidney disease</td>
<td>2,295</td>
<td>8</td>
</tr>
<tr>
<td>Urologic disease</td>
<td>2,837</td>
<td>9</td>
</tr>
<tr>
<td>Other known</td>
<td>10,705</td>
<td>35</td>
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<tr>
<td>Unknown</td>
<td>4,055</td>
<td>13</td>
</tr>
<tr>
<td>Missing</td>
<td>1,979</td>
<td>4</td>
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</tbody>
</table>

**Total ESRD patients**

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
<th>Adj. Rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>104,364</td>
<td>339</td>
</tr>
<tr>
<td>Unadjusted rate</td>
<td>342</td>
<td>1,556</td>
</tr>
</tbody>
</table>

**Average annual percent change in rates per million**

<table>
<thead>
<tr>
<th>Incident patients</th>
<th>Prevalent patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>PD</td>
</tr>
<tr>
<td>HD 96–00 to 04</td>
<td>PD 96–00 to 04</td>
</tr>
</tbody>
</table>

**Medicare & non-Medicare spending**

<table>
<thead>
<tr>
<th>Medicare spending for ESRD in 2004 (billions of dollars)</th>
<th>SAF paid claims (Part A &amp; B)</th>
<th>2% incurred but not reported</th>
<th>HMO-Medicare risk</th>
<th>Organ acquisition</th>
<th>Total Medicare costs</th>
<th>Non-Medicare spending for ESRD (billions of dollars)</th>
<th>EGHP (MSP)</th>
<th>Patient obligations</th>
<th>Non-Medicare patients</th>
<th>Total non-Medicare costs</th>
<th>Change in Medicare spending from 2003 to 2004</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAF paid claims (Part A &amp; B)</td>
<td>18.36</td>
<td>0.37</td>
<td>1.09</td>
<td></td>
<td>20.07</td>
<td>Non-Medicare spending for ESRD (billions of dollars)</td>
<td>2.29</td>
<td>3.84</td>
<td>6.27</td>
<td>12.40</td>
<td>Change in Medicare spending from 2003 to 2004</td>
<td>9.1</td>
</tr>
<tr>
<td>2% incurred but not reported</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non-Medicare spending for ESRD (billions of dollars)</td>
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<td>Change in Medicare spending from 2003 to 2004</td>
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</tr>
<tr>
<td>HMO-Medicare risk</td>
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<td></td>
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<td>3.84</td>
<td>6.27</td>
<td>12.40</td>
<td>Change in Medicare spending from 2003 to 2004</td>
<td>9.1</td>
</tr>
<tr>
<td>Organ acquisition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non-Medicare spending for ESRD (billions of dollars)</td>
<td>2.29</td>
<td>3.84</td>
<td>6.27</td>
<td>12.40</td>
<td>Change in Medicare spending from 2003 to 2004</td>
<td>9.1</td>
</tr>
<tr>
<td>Total Medicare costs</td>
<td>20.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non-Medicare spending for ESRD (billions of dollars)</td>
<td>2.29</td>
<td>3.84</td>
<td>6.27</td>
<td>12.40</td>
<td>Change in Medicare spending from 2003 to 2004</td>
<td>9.1</td>
</tr>
</tbody>
</table>

**Notes**

* Values for cells with ten or fewer patients are suppressed. ** Zero patients in this cell.

A Incident counts: include all known ESRD patients, regardless of any incomplete data on patient characteristics and of U.S. residency status.
B Includes only residents of the 50 states and Washington D.C. Rates are adjusted for age, race, and/or gender using the estimated July 1, 2003 U.S. resident population as the standard population. Rates are per million population. Rates by age are adjusted for race and gender. Rates by gender are adjusted for age and race. Rates by race and gender are adjusted for age and gender. Rates by disease group and total adjusted rates are adjusted for age, gender, and race. Adjusted rates do not include patients with other or unknown race.
C Patients are classified as receiving dialysis or having a functioning transplant. Those whose treatment modality on December 31 is unknown are assumed to be receiving dialysis. Includes all Medicare and non-Medicare ESRD patients, and patients in the U.S. Territories and foreign countries.
D Deaths are not counted for patients whose age is unknown.
E A patient is counted at the start of therapy for incidence. On December 31 for point prevalence, at the time of transplant for transplants, and on the date of death for death.
F Includes patients whose modality is unknown.
G Unadjusted total rates include all ESRD patients in the 50 states and Washington D.C.
H Total transplants as known to the USRDS; 33 transplants with unknown donor type excluded from counts.

**Summary**

During 2004, 104,364 new dialysis and transplant patients began ESRD therapy, with an adjusted rate of 339 per million population (Table p.a). More than 472,000 patients were receiving treatment on December 31, 2004—353,965 were on dialysis, and 136,166 had a functioning graft; the adjusted prevalent rate was 1,542 per million population. Almost 17,000 transplants were performed during the year, including 6,644 from living donors, and 84,252 patients died.

Between the 1996–2000 and 2000–2004 periods, the average annual percent change in rates per million in the hemodialysis population fell from 3.9 to 1.0 in incident patients, and from 5.1 to 2.1 in prevalent patients. In the transplant population, incident growth slowed from 5.5 to 2.5 percent, and prevalent growth from 4.9 to 4.0 percent. Both incident and prevalent rates in the peritoneal dialysis population continue to decline, though not as quickly as in the late 1990s.

Medicare spending per patient year rose 4.4 percent between 2003 and 2004; after adjustment for inflation, however, growth was 0.0–1.7 percent. Total Medicare costs for ESRD reached $20.1 billion, while non-Medicare costs rose to $12.4 billion. Medicare spending per patient year was nearly $58,000 for ESRD overall—$68,000 for hemodialysis, $49,000 for peritoneal dialysis, and $24,000 for transplant.

Reaching 335,963 in 2004, the prevalent dialysis population has tripled since 1988, and grew 16 percent after 2000 (Figure p.2). The incident population is 2.5 times larger than in 1988, at 102,104 patients, but growth has slowed, and was only 1.5 percent between 2003 and 2004. Growth has been most dramatic in the prevalent transplant population—at 136,116 patients, the 2004 count is 231 and 26 percent higher than counts in 1988 and 2000, respectively. In 2004, nearly 5,200 patients returned to dialysis after a transplant failure, and 2,142 restarted dialysis after recovering function or discontinuing therapy—40 and 48 percent more, respectively, than in 1999.

Ninety-one percent of patients new to ESRD therapy begin on hemodialysis, while only 6 percent start on peritoneal dialysis.
dialysis (Figure p.3). The number of patients receiving a preemptive transplant reached 2,260 in 2004, nearly seven times the number in 1980, and a 30 percent increase over 2000.

More than 309,000 prevalent patients received hemodialysis in 2004—18 percent more than in 2000, and almost seven times the level in 1980 (Figure p.4). The number of prevalent patients treated with peritoneal dialysis peaked at 30,294 in 1995, and has since dropped 15 percent to 25,765. And the prevalent transplant population of 136,136 reflects a 25 percent growth since 1995.

As noted, Medicare ESRD costs reached $20.1 billion in 2004—a 57 percent increase since 1999, and nearly 12 percent greater than in 2003 (Figure p.5). This one-year growth is the highest in the past five years. Non-Medicare costs have risen at even greater rates, in 2004 reaching $12.4 billion—growth of 76 and 13.8 percent over 1999 and 2003 levels, respectively.

II Figure p.2 first graph: incident patients & December 31 point prevalent patients. Second graph: data obtained from CMS’s annual End-Stage Renal Disease Facility Survey, CMS Independent Renal Facility Cost Reports, & the CMS “Dialysis Facility Compare” website. II Figure p.3 incident ESRD patients; excludes those with unknown modality. II Figure p.4 December 31 point prevalent ESRD patients; excludes those with unknown modality. II Figure p.5 Medicare costs obtained from claims files, & include all Medicare primary payer claims as well as amounts paid by Medicare as secondary payer. Also included in the Medicare total are HMO costs, estimated as the number of HMO months times the Medicare AAPCC, & organ acquisition costs, estimated as $25,000 per transplant. Non-Medicare estimate includes all non-Medicare patients; estimate based on per year costs from Medstat ESRD patients. Primary payer estimates for Medicare as secondary payer patients obtained using difference between paid claims & AAPCC for these patients. See Appendix A for further details.
Incident rates for dialysis fell slightly between 2003 and 2004—from 336 to 333 per million population in the dialysis population as a whole, from 312 to 310 for hemodialysis, and from 22.3 to 21.6 for peritoneal dialysis (Figure p.6). Prevalent rates, in contrast, continue to increase for all modalities except peritoneal dialysis, in which they fell 2 percent in 2004 to 84 per million population. The prevalent rate for transplant patients increased 3.8 percent after 2003, to 447, while the rate for all dialysis grew 1.1 percent, to 1,095, and the rate for hemodialysis topped 1,000 for the first time, reaching 1,008.

Geographic patterns show that incident and prevalent rates for hemodialysis patients are highest in the Gulf Coast states and states along the Atlantic Seaboard. Peritoneal dialysis rates for incident patients vary widely across the country, and are highest in North Dakota, Kansas, Arkansas, Mississippi, South Carolina, Idaho, and Alaska. Prevalent hemodialysis rates are highest in the southern states of Arkansas, Mississippi, Alabama, Georgia, and South Carolina, as well as in New Mexico, Idaho, and Alaska. Transplant rates for both incident and prevalent patients continue to be highest in the Upper Midwest, reaching nearly 600 per million population for those individuals residing in areas represented by the upper quintile (Figure p.7).

On December 31, 2004, there were 60,398 patients on the transplant wait list, 2.5 times more than in 1995 (Figure p.8). By race,
there were 32,299 whites, 21,612 blacks, and 6,487 patients of other races—up 138, 155, and 276 percent, respectively, from 1995 counts. The overall median waiting time rose 5.3 percent from 2003 to 2004, to reach 716 days. At 844–879 days, wait times for non-white patients continue to be 41–47 percent higher than those for whites.

Counts of wait-listed patients are highest in California, Texas, and multiple states located east of the Mississippi (Figure p.9). Wait list counts average over 4,000 patients in these areas represented by the upper quintile. Mean wait times for a kidney transplant in California, North Carolina, Mississippi, and New York average 2.75 years, as represented by the upper quintile, and parallel the high number of patients waiting for a transplant in these states. In states such as Florida and Pennsylvania, however, median wait times for a kidney transplant average just over one year, even though these state have a high number of wait-listed patients. 

II Figure p.6 incident & December 31 point prevalent ESRD patients; rates adjusted for age, gender, & race. II Figure p.7 per million population, incident & December 31 point prevalent ESRD patients, 2004, by state. Excludes patients residing in Puerto Rico & the Territories. II Figure p.8 patients listed for kidney or kidney-pancreas transplants on December 31 of each respective year. Multiple listings not counted. Median wait times are for patients receiving a transplant during the given year. II Figure p.9 state counts show the number of patients listed at a transplant center within the state on December 31, 2004; patients may be listed in more than one state. Median wait times are calculated for patients transplanted at a center within the state during 2004. Excludes patients residing in Puerto Rico & the Territories.
As stipulated in the guidelines of the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (K/DOQI), the arteriovenous (AV) fistula is the preferred access for hemodialysis patients. Use of this access results in lower rates of infection and increased dialysis efficiency. According to the 2004 Clinical Performance Measures (CPM) survey, 38.9 percent of December 31, 2003 point prevalent patients had an AV fistula as their primary access; catheters were used by 23.1 percent, and AV grafts in 38.2 percent (Figure 10).

As of 2002, hospital admissions for vascular access infection appear to have leveled off, and in 2004 stood at 132 per 1,000 patient years at risk. Admission rates for peritonitis in 2004 were 120 per 1,000 patient years, down 25 percent from those reported in 2000. By gender, 18.3 percent more males than females had AV fistula insertions, while rates were similar for diabetic and non-diabetic patients, at 112.7 and 110.4 insertions per 1,000 patient years, respectively. One-third more females than males had an AV graft in 2004, and rates in diabetic patients were 17.4 percent higher when compared to non-diabetics. AV graft use has fallen by nearly 40 percent since 1999. Use of catheters is 29.9 percent higher in females than in males, and 15.3 percent higher in diabetics compared to non-diabetics. Catheter use since 1993 has fallen less dramatically than AV graft use, by nearly 10 percent.

In order to assure acceptable hemodialysis adequacy, a target urea reduction ratio (URR) of 65 percent or higher has been established by the K/DOQI guidelines. As of 2003, 87 percent of patients tracked by the CPM project—twice as many as ten years ago—meet or exceed this standard (Figure 11). Similar advances have taken place in the peritoneal dialysis population as well, with 73 percent of patients achieving a mean weekly Kt/V of 2.0 or higher (Figure 12).

K/DOQI guidelines recommend a target hemoglobin of 11–12 g/dL. Great strides have been made by providers in this area since 1991 and, as of June, 2005, 80 percent of dialysis patients meet or exceed this target (Figures 13–14). It is important to note, however, that this achievement is directly related to significant increases in EPO doses over the time period. The mean weekly EPO dose as of June, 2005, stood at over 18,000 units, nearly three times the average dose provided to patients in 1991. The rising costs associated with increasing EPO doses present a significant economic challenge to the ESRD program. Medicare spending for EPO grew to $1.8 billion in 2004 (see Figure 16), up 17 percent from the year before, and per person per month spending on EPO therapy is now nearly one-half that of the monthly cost for dialysis.

The American Diabetic Association recommends that diabetic patients receive at least four glycosylated hemoglobin tests per year. In 2003–2004, 46.5 percent of ESRD patients met this standard, nearly double the level of 1999–2000 (Figure 15). Over 22 percent of diabetics received no tests at all, down slightly from the 2002–2003 time period. At least two lipid tests per year are recommended for diabetic patients. The percentage meeting this recommendation continues to grow, and in 2003–2004 two of three patients were tested. Reimbursement for diabetic test strips was added to Medicare benefits in 1997, and, in 2003–2004, 42 percent of patients received a prescription for these strips, a slight increase. It is not clear, however, if all claims for tests strips are captured in the database, as some patients may purchase test strips and not apply for Medicare reimbursement.

![Image showing trends in quality of care](Figure 10)
In the three months prior to a diagnosis of ESRD, more than 80 percent of patients age 67 and older (the only ESRD patients who can be tracked in the pre-ESRD period) are hospitalized, with 46 percent hospitalized for cardiovascular disease (Figure p.17). Rates fall after this spike, yet remain higher than in the two years prior to ESRD diagnosis; between months 3 and 6, hospitalization rates overall, for cardiovascular disease, and for infection are 37, 15, and 12 percent, respectively.

Since 1993, hospital admissions for vascular access have declined nearly 27 percent, most likely because of the shift to outpatient services for vascular access (Figure p.18). All-cause admission rates have remained stable. Rates of admission for cardiovascular disease, in contrast, are now 12 percent greater than in 1993, and admissions for infection have increased more than 23 percent.

Hospital admission rates by patient vintage have not changed dramatically over time (Figure p.19). Overall and in the hemodialysis population, rates in 2004 reached 2.0 and 2.1 admissions per patient year, respectively, in the newest patients—5.8–6.4 percent higher than in those with ESRD for three or more years. In the peritoneal dialysis and transplant populations, in contrast, admission rates are slightly higher in patients of older vintage.

By modality, admissions for cardiovascular disease and infection have increased 13.5 and 31.5 percent, respectively, in hemodialysis patients since 1993 (Figure p.20). In the transplant population, in contrast, rates have fallen 20.8 and 3.9 percent, while cardiovascular admissions in peritoneal dialysis patients have decreased 7.5 percent, and infectious admissions have grown only 2.1 percent. Compared to rates in the transplant population, all-cause admission rates are 2.0–2.1 times greater in patients on dialysis.

Since 1980, the overall mortality rate for patients in their first year of ESRD therapy has fallen 24 percent, from 307 to 234 per 1,000 patient years (Figure p.21). For peritoneal dialysis and trans-
plant patients, the decrease has been a dramatic 60 and 81 percent, respectively. These changes, however, mask the recent stability of first-year rates for ESRD and hemodialysis patients; rates in these populations have changed less than 2 percent since 1996. Reasons for this lack of progress are the focus of active investigation by the USRDS.

The first year of therapy brings the highest rates of mortality for transplant patients, and the lowest rates for patients on peritoneal dialysis. In the hemodialysis population, the lowest rates occur in the second year of therapy, and the highest during the fifth.

Data by patient vintage continue to illustrate the dramatic effect on mortality rates of time on ESRD therapy (Figure p.22). Two decades ago the highest mortality rates in the hemodialysis population were found in the newest patients. Since then, however, their rates have fallen—21 percent since 1986—while rates for patients of older vintage remain steady. A similar change has occurred for patients on peritoneal dialysis: in 1980, rates for patients of older vintage were only 7 percent higher than for those of vintage less than three years; in 2004, however, their rates were 65 percent greater.

Patients who initiate ESRD therapy with a renal transplant have five-year survival probabilities that are more than two times higher than those found in dialysis patients; between the 1990–1994 and 1995–1999 time periods, survival after five years for these patients rose from 68.5 to 74.2. Patients on peritoneal dialysis have a slight survival advantage over their hemodialysis counterparts in the early months of therapy. By year two, however, this advantage disappears, and at the end of five years slightly favors those on hemodialysis.
Medicare costs for ESRD continue to rise, and in 2004 increased to $20.1 billion—representing an 11.7 percent increase from the year before, and accounting for 6.7 percent of total yearly Medicare expenditures (Figure p.24). Employer group health plan (EGHP) expenditures for ESRD increased to $390 million, 1.6 percent of their total expenditures of $24.4 billion.

Per person per month (PPPM) costs in the six months prior to and following ESRD initiation are slightly higher in Medicare patients age 65–74 than in those age 75 and older; both groups show dramatic, five-fold increases in expenditures in the month of ESRD initiation (Figure p.25). Patients with commercial insurance have higher costs throughout the entire time period, likely due to higher rates of reimbursement. Costs for these patients in the month prior to ESRD are 2–3 times higher than those in Medicare patients and remain so in the following six months, topping out at $13,000 in patients younger than 45 and $12,800 in those age 45–64.

Total Part A and B ESRD expenditures were nearly $18.4 billion in 2004, 3.4 times more than the $5.5 billion spent in 1991 (Figure p.26). Inpatient and Part B costs rose 200 percent, to $6.7 and $3.7 billion, respectively, while outpatient costs rose 266 percent to reach nearly $7 billion—reflecting changes in both the provider system and in services such as vascular access insertion and care.

Annual costs for dialysis and transplant continue to increase for both Medicare and EGHP patients (Figure p.27). In 2004, Medicare dialysis costs increased to more than $16 billion, 3.5 times higher than amounts spent in 1991; between 2003 and 2004, inpatient, outpatient, and Part B costs increased by 6.1, 9.9, and 10.8 percent, respectively. Dialysis costs for EGHP patients increased dramatically between 1999 and 2004—more than five-fold—with costs in 2004 exceeding $224 million, 68 percent higher than expenditures in 2003. Outpatient EGHP costs account for nearly 80 percent of total expenditures, exceeding $176 million per year. Medicare transplant costs have doubled since 1991, reaching $923 million in 2004—an increase of over 10 percent from the previous year—and nearly 70 percent of total transplant costs result from inpatient services. Transplant costs for EGHP patients have grown by over 300 percent since 1999, and rose from $20.5 million in 2003 to $31.4 million in 2004. When compared to those of Medicare patients, costs for inpatient and outpatient services in EGHP patients are more evenly divided, at $16 and $14.3 million, respectively.
In 2004—an increase of 80 percent since 1991, and of 5.5 percent over those for inpatient services for the first time, reaching $21,954 in 2004. Part B physician/supplier costs for patients with a functioning graft, for instance, have tripled since 1991, to $6,314 in 2004. And outpatient costs for patients whose grafts fail within a year have grown 18 percent, to $22,083.

Total Medicare expenditures for dialysis reached $16.3 billion in 2004, an increase of 9.3 percent over the previous year (Table p.b). Expenditures for patients with a functioning graft topped $1 billion, and those for patients receiving a transplant reached $922 million—one-year growth of 8.8 and 10.4 percent, respectively. Total per patient year Medicare costs continue, not surprisingly, to be greatest for transplant events within the year, at nearly $99,000 in 2004. This high cost in the year of transplant, however, is balanced by yearly expenditures of only $16,376 for patients with functioning grafts, a level just one-fourth that of the $66,650 incurred by dialysis patients.

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We use the Venn diagrams on this spread to illustrate the disproportionate use of resources by patients who carry some of the greatest disease burdens, this year presenting data on CKD, diabetes, and hypertension. In the Medicare population, for example, just 2.6 percent of patients carry all three diagnoses, but their care accounts for 9.1 percent of total costs (Figures p.30–31). Patients with any of these conditions, alone or in combination with one another, account for 61.2 percent of the Medicare population, but they use 80.8 percent of total expenditures.

For Medicare CKD patients in 2004, per person per year (PPPY) costs reached $20,668, 5.3 percent more than in 2003, and a 41 percent increase over 1993 (Figure p.32). Costs are highest in patients with the greatest comorbidity—those whose CKD is accompanied by both diabetes and hypertension. PPPY costs for these patients were $23,624 in 2004, 1.5 times greater than those for patients with CKD and diabetes alone. Patterns are similar in the EGHP population, with costs for patients with all three diagnoses reaching $42,722 in 2004 (Figure p.37).

Expenditures are affected by hospitalization rates, which, as shown in Figures p.33 and p.38, are also linked to comorbidity. During the entire three-year followup period, the most complex patients—those with diabetes and hypertension as well as CKD—have the highest rates. At 36 months, for example, their rate of 1.1 admissions per patient year in the Medicare population is 18 percent greater than that of patients with CKD and diabetes alone.

For the EGHP population age 50–64, Venn diagrams also illustrate the dramatic impact of patient diagnoses on costs (Figures p.34–35). Not quite one in four of these patients carries a diagnosis of CKD, diabetes, or hypertension, alone or in combination, yet care of these patients accounts for 48 percent of all expenditures.

Compliance with drug therapy can be measured by the medication possession ratio (MPR), which captures the amount of time that a patient remains on chronic drug therapy. Non-compliance with drug therapy can translate into significant increases in healthcare costs. When comparing expenditures for patients taking cardiac, lipid-lowering, and anti-diabetic oral medications, costs in CKD and ESRD patients with MPRs of less than 80 percent are 44–66 and 24–41 percent higher, respectively, than those in patients with MPRs of 80 percent or higher (Figure p.36).
**PATIENTS & COSTS: MEDSTAT MARKETSCAN (EGHP) DATA**

**p.34** Distribution of CKD, HTN, & diabetic patients in the EGHP population, 2004. Patients surviving all of 2003, age 50–64.

- **CKD:** 1.0% of total population
- **DM:** 8.9%
- **HTN:** 17.2%

**EGHP**

Mean age 56.6 ± 4.2

**p.36** Total healthcare patient costs for compliance vs. non-compliance with drug therapy. Incident CKD & ESRD patients.

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>MPR &lt; 80%</th>
<th>MPR ≥ 80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE-Is/ARBs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta blockers</td>
<td></td>
<td></td>
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<tr>
<td>Statins</td>
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<tr>
<td>Secretagogues</td>
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</tr>
</tbody>
</table>

**p.37** Influence of diabetes & HTN on CKD expenditures: EGHP patients. Period prevalent CKD patients, age 50–64.

**p.38** Influence of diabetes & HTN on hospitalization rates: EGHP patients. Point prevalent CKD patients, age 50–64.

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*Figures p.30–31* population estimated from the 5 percent Medicare sample, includes patients surviving all of 2003 with Medicare as primary payor. Diagnoses determined from claims in 2003 & 2004. Patients in the 5 percent sample who develop (Figure p.30) or have (Figure p.31) ESRD are excluded. Costs are for calendar year 2004, with patients censored at development of ESRD. **Figure p.32** period prevalent CKD patients from the 5 percent Medicare sample. Patients are Medicare entitled, not enrolled in an HMO for entire year, & diagnosed with CKD in the year prior to cost year or during cost year. **Figure p.33** point prevalent CKD patients from the 5 percent Medicare sample, followed from January 1, 2002, through December 31, 2004. Patients are entitled for the entire 2001 calendar year, not enrolled in an HMO, & diagnosed with CKD during 2001. **Figures p.34–35** patients in the Medstat database, age 50–64, who survive & are eligible for all of 2003; patients who develop or have ESRD are excluded. Diagnoses determined from claims in 2003. Costs are for calendar year 2004, with patients censored at development of ESRD. **Figure p.36** incident CKD & ESRD patients, 2000–2004 combined, from the Medstat database 1999–2004; inpatient & outpatient expenditures in the 12 months following the first prescription drug service. **Figure p.37** period prevalent CKD patients from Medstat database, ages 50–64. Patients are enrolled for the full year prior to the cost year & diagnosed with CKD, or diagnosed with CKD during the cost year. **Figure p.38** point prevalent CKD patients from the Medstat database, age 50–64, followed from January 1, 2002, through December 31, 2004. Patients are enrolled for the entire 2001 calendar year, & diagnosed with CKD during 2001.
Overall value for all pts

Figure number  p.7  p.7  p.7  p.7  p.7  p.7  p.7  p.7  p.7
inc HD  inc PD  inc tx  prev HD  prev PD  prev tx  wait time
Overall value for all pts 312.9  21.9  6.8  1,019.2  85.0  453.4  1.72
Total patients 94,891 6,686 2,260 309,269 25,765 136,136 63,886
Overall value for pts mapped 309.5  21.6  6.6  1,008.1  83.9  447.2  1.72
Missing HSA/state: pts dropped 3,202 291 304 8,895 816 3,283 0

Maps: national means & patient populations

Pricis

Chapter summary

Trends in ESRD counts & spending

In 2004, 104,364 new dialysis and transplant patients began ESRD therapy, with an adjusted rate of 339 per million population. More than 473,000 patients were receiving treatment on December 31, 2004—335,963 were on dialysis, and 136,136 had a functioning graft; the adjusted prevalent rate was 1,542 per million population. Almost 17,000 transplants were performed during the year, including 6,644 from living donors, and 8,4352 patients died. Total Medicare costs for ESRD reached $20.1 billion in 2004, while non-Medicare costs rose to $12.4 billion. Medicare spending per patient year was nearly $58,000 for ESRD overall—$68,000 for hemodialysis, $49,000 for peritoneal dialysis, and $24,000 for transplant.

Trends in modalities

Figure p.6 Incident rates for dialysis fell slightly between 2003 and 2004—from 336 to 333 per million population in the dialysis population as a whole, from 312 to 310 for hemodialysis, and from 22.3 to 21.6 for peritoneal dialysis. Figure p.8 On December 31, 2004, there were 60,398 patients on the transplant wait list, 2.5 times more than in 1995.

Trends in quality of care

At the time of the 2003 Clinical Performance Measures (CPM) survey, 39 percent of prevalent patients had an AV fistula as their primary access; catheters were used by 23.1 percent, while AV grafts were used in 38.2 percent of all patients surveyed. Figures p.11–12 As of 2003, 87 percent of patients tracked by the CPM project—twice as many as ten years ago—meet or exceed K/DOQI’s target urea reduction ratio of 65 percent. Similar advances are seen in the peritoneal dialysis population, with 73 percent of patients having a mean weekly Kt/V of 2.0 or higher. Figure p.13 Current data show that slightly over 80 percent of prevalent dialysis patients now meet the target hemoglobin level of 11–12 mg/dl established by K/DOQI guidelines. Figure p.15 In 2003–2004, 67 percent of diabetic patients received at least two glycosylated hemoglobin tests per year, while 47 percent received the four or more tests recommended by the American Diabetes Association.

Trends in hospitalization & mortality

Figure p.18 Since 1993, hospital admissions for vascular access have declined nearly 27 percent, most likely because of the shift to outpatient services for vascular access. All-cause admission rates have remained stable, but rates of admission for cardiovascular disease, in contrast, are now 12 percent greater than in 1993, and admissions for infection have increased more than 23 percent. Figure p.21 Since 1980, the overall mortality rate for patients in their first year of ESRD therapy has fallen 24 percent, from 307 to 234 per 1,000 patient years. For peritoneal dialysis and transplant patients, the decrease has been a dramatic 60 and 81 percent, respectively. These changes, however, mask the recent stability of first-year rates for ESRD and hemodialysis patients; rates in these populations have changed less than 2 percent since 1996.

Medicare costs for ESRD continue to rise, and in 2004 increased to $20.1 billion—representing an 11.7 percent increase from the year before, and accounting for 6.7 percent of total yearly Medicare expenditures. EGHP expenditures for ESRD increased to $390 million, 1.6 percent of their total expenditures of 24.4 billion. Table p.b Total Medicare expenditures for dialysis reached $16.3 billion in 2004, an increase of 9.3 percent over the previous year. Expenditures for patients with a functioning graft topped $1 billion, and those for patients receiving a transplant reached $922 million—one-year growth of 8.8 and 10.4 percent, respectively.

Maps: national means & patient populations

Patients with CKD, diabetes, or hypertension, alone or in combination with one another, account for 61.2 percent of the Medicare population, but they use 80.8 percent of total expenditures. Figures p.34–35 In the EGHP population, not quite one in four patients carries a diagnosis of CKD, diabetes, or hypertension, alone or in combination, yet care of these patients accounts for 48 percent of all expenditures.