there is always one moment in childhood when the door opens and lets the future in.

Graham Greene,
The Power and the Glory
In pediatric ESRD patients of all age groups both incident and prevalent rates have increased moderately since 1990 (table 6.1). Rates continue to be highest in the 15–19 age group, with particularly high rates—three times those of whites—seen in black children of both genders (fig 6.2).

Among pediatric dialysis patients the most common causes of renal failure are glomerulonephritis and cystic/heritary/congenital kidney disease, with the latter disease occurring almost twice as often in male children as in females (fig 6.7). Glomerulonephritis is more common in children of color, and the rate of secondary glomerulonephritis/vasculitis is twice as high in Asian children than in the other populations (fig 6.8). The most frequent primary diagnosis among pediatric transplant patients is cystic/heritary/congenital kidney disease; the number of boys with this diagnosis is almost three times as high as the number of girls (fig 6.10).

While the numbers of living donor and cadaveric first transplants were similar between 1995 and 1997, the number of transplants from living donors has begun to increase once again (a total of 30% since 1994), while the number of cadaveric donations continues to decline (fig 6.19). Transplant rates are highest in children aged 5–9, and while cadaver transplant are slightly more frequent in older children, children aged 0–4 are almost twice as likely to receive a kidney from a living donor (fig 6.20).

When examined in terms of race, transplants from living donors are most common in white and female Native American children, and least likely to occur in black and Asian children (fig 6.21). The rates of cadaveric transplantation, however, are highest in children of Asian descent. Overall survival rates echo those of adult patients, with rates dramatically lower for pediatric dialysis patients than for children who have received transplants (fig 6.22). Patient and graft survival curves for both cadaver and living donor transplants show generally equivalent rates in females compared to males, but lower rates, in many age groups, for black children compared to white (figs 6.23–26). Survival in black children also shows the most variation by patient age.

Infection is more frequent in peritoneal dialysis patients, and occurs with much higher rates in the youngest children (figs 6.28–30). With the exception of admissions for respiratory infections in transplant patients, admission rates for overall and respiratory infections are higher in girls at most stages of ESRD than in boys; the rate of respiratory infections in female dialysis patients, in fact, increases steadily for these patients the longer they have ESRD (figs 6.32–37).

Causes of death were generally similar between genders, with the exception of cardiac arrest and cardiac “other” causes in peritoneal dialysis patients; deaths attributed to these causes were at least three times more common in girls (figs 6.38–40). Twice as many white children on hemodialysis died from infection; more black children on peritoneal dialysis, in contrast, died from the same cause, and cardiac arrest was more frequent in this group as well (figs 6.41–42).

Future analyses will examine how regional differences in socio-economic factors and in the availability of pediatric nephrologists may be associated with outcomes in pediatric patients.

Included in this chapter

- Graphs and maps of incident and prevalent rates; graphs of patient distribution by modality, primary diagnosis, gender, race, and age; and graphs showing causes of renal failure by age group and by race
- Graphs of first and repeat transplant rates, and Kaplan-Meier survival curves of patient and graft survival
- Graphs and maps of hospitalization rates by modality and by primary diagnosis; graphs of heart disease by age and race
- Causes of death by race and modality
### Table 6.1

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Rates per million population

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### Figure 6.1

Incident rates per million population, unadjusted

### Figure 6.2

Incident rates by race, gender, & age group per million population, 1996–1998 combined, unadjusted

Includes only white, black, Native American, and Asian patients.
Figures 6.5 & 6.6
Incident rates by gender & primary diagnosis
per million population, 1994–1998 combined, by state, unadjusted
Figure 6.7  
Number of patients, by gender, within primary diagnosis group  
dialysis patients, 1994–1998 combined

Figure 6.8  
Distribution of primary diagnosis within racial group  
dialysis patients, 1994–1998 combined

Figure 6.9  
Mean & median age within primary diagnosis group  
dialysis patients, 1994–1998 combined
**Figure 6.10**
Number of patients, by gender, within primary diagnosis group
transplant patients, 1994–1998 combined

**Figure 6.11**
Distribution of primary diagnosis within racial group
transplant patients, 1994–1998 combined

**Figure 6.12**
Mean & median age within primary diagnosis group
transplant patients, 1994–1998 combined
Figure 6.13
Racial distribution within primary diagnosis group
dialysis patients, 1994–1998 combined

Figure 6.14
Racial distribution within primary diagnosis group
transplant patients, 1994–1998 combined

Figure 6.15
Gender distribution within primary diagnosis group
1994–1998 combined

Diabetes, glomerulonephritis, secondary glomerulonephritis, interstitial nephritis/pyelonephritis, hypertension, cystic kidney/hereditary/congenital, and neoplasms/tumors are abbreviated along the x-axis.
Figure 6.16
Causes of renal failure within age group incident patients, 1994–1998 combined

Figure 6.17
Treatment modality two years following ESRD onset, within race group incident patients, 1994–1996 combined

Figure 6.18
Treatment modality two years following ESRD onset, within age group incident patients, 1994–1996 combined
Figure 6.19
Total first transplants by donor source & year
Includes patients not eligible for Medicare enrollment. The number of transplants in 1994, and the percent change between 1994 and 1998, are indicated in the legend.

Figure 6.20
First transplant rates
by age group & gender, 1996–1998 combined

Figure 6.21
First transplant rates
by race & gender, 1996–1998 combined
Because of the small number of patients, data are not shown for Native American or Asian patients.

Because of the small number of patients, data are not shown for Native American or Asian patients.

Because of the small number of patients, data are not shown for Native American or Asian patients.
Figure 6.25
Kaplan-Meier 5-year graft survival after first transplantation
Cadaveric transplants, 1992–1993 combined
Because of the small number of patients, data are not shown for Native American or Asian patients.

Figure 6.26
Kaplan-Meier 5-year graft survival after first transplantation
Living donor transplants, 1992–1993 combined
Because of the small number of patients, data are not shown for Native American or Asian patients.

Figure 6.27
Total repeat transplants by donor source & year
The number of repeat transplants in 1994, and the percent change from 1994 to 1998, are shown in the legend. Includes patients not eligible for Medicare enrollment.
Admissions per 100 patient years

Ages 0-4
Ages 5-9
Ages 10-14
Ages 15-19

Cardiovascular overall
Infection overall

Figure 6.28
First hospital admission rates
all dialysis, 1996–1998 combined

Admissions per 100 patient years

Ages 0-4
Ages 5-9
Ages 10-14
Ages 15-19

Cardiovascular overall
Infection overall
Infection, vascular access
Vascular access overall

Figure 6.29
First hospital admission rates
hemodialysis, 1996–1998 combined

Admissions per 100 patient years

Ages 0-4
Ages 5-9
Ages 10-14
Ages 15-19

Cardiovascular overall
Infection overall
Infection, peritonitis
Catheter complication

Figure 6.30
First hospital admission rates
peritoneal dialysis, 1996–1998 combined
Figure 6.31
Admission rates for hemodialysis & peritoneal dialysis patients
rates per 100 patient years at risk, by principal diagnosis or procedure category, 1996–1998 combined, by network

Alaska is included in Network 16, Hawaii in Network 17.
Figure 6.32
Admissions for infection (overall)
by time on ESRD
dialysis patients, 1996–1998
combined

Figure 6.33
Admissions for infection (overall)
by time on ESRD
hemodialysis patients, 1996–
1998 combined

Figure 6.34
Admissions for infection (overall)
by time on ESRD
peritoneal dialysis patients,
1996–1998 combined
Figure 6.35
Admissions for infection (overall) by time on ESRD transplant patients, 1996–1998 combined

Figure 6.36
Admissions for respiratory infections by time on ESRD dialysis patients, 1996–1998 combined

Figure 6.37
Admissions for respiratory infections by time on ESRD transplant patients, 1996–1998 combined
Deaths per 1,000 patient years at risk

0 2 4 6 8 10 12

Male Female

Cardiac arrest  Cardiac other  Cerebrovascular disease  Infection  Malignancy  Other known  Unknown

Figure 6.38
Causes of death by gender
prevalent hemodialysis patients, 1996–1998 combined

Figure 6.39
Causes of death by gender
prevalent peritoneal dialysis patients, 1996–1998 combined

Figure 6.40
Causes of death by gender
prevalent transplant patients, 1996–1998 combined
Deaths per 1,000 patient years at risk

Figure 6.41
Causes of death by race
prevalent hemodialysis patients, 1996–1998 combined

Because of the small number of patients, data are not shown for Native American or Asian patients.

Figure 6.42
Causes of death by race
prevalent peritoneal dialysis patients, 1996–1998 combined

Because of the small number of patients, data are not shown for Native American or Asian patients.

Figure 6.43
Causes of death by race
prevalent transplant patients, 1996–1998 combined

Because of the small number of patients, data are not shown for Native American or Asian patients.