

Chronic Kidney Disease and Kidney Failure



Yesterday

- One third of diabetic patients were destined to develop kidney failure.
- Two lifesaving renal replacement therapies, dialysis and renal transplantation, developed through fundamental NIH research in the 1960s, were increasingly available; however, neither was ideal.
- Dialysis left patients feeling washed out and unable to work. Patients suffered from disabling bone disease, dementia caused by aluminum intoxication, and severe fatigue from uncontrollable anemia. High cardiovascular disease death rates limited life expectancy.
- Some patients were lucky enough to get a kidney transplant, which greatly improved their quality of life and life expectancy. However, transplantation was not common, and acute rejection resulted in transplantation failure rates of 30 to 50 percent.
- No methods were available to screen diabetic patients for early signs of kidney injury, so preventive treatments were not possible.
- Few treatments for kidney disease were available, and the importance of controlling blood sugar and blood pressure was not recognized.
- Kidney failure was increasing at epidemic rates. Through the 1980s and 1990s, the number of patients developing end-stage kidney failure nearly doubled each decade.

Today

- An estimated 23 million American adults have chronic kidney disease. Currently the NIH spends \$655 million on kidney disease research.
- With good care, fewer than 10 percent of diabetics develop kidney failure.
- Management of complications has markedly improved the quality of life of dialysis patients. Dialysis dementia due to aluminum toxicity no longer occurs.
- Premature death due to cardiovascular disease and all other causes are higher in adults with chronic kidney

disease. Individuals with chronic kidney disease are 16 to 40 times more likely to die than to progress to kidney failure. High cardiovascular death rates in dialysis patients are also a serious problem.

- Transplantation is widely available, although limited organ availability has resulted in longer waiting times.
- Transplant failure due to acute rejection is much less common, with one-year success rates exceeding 90 percent.
- Kidney disease can be detected earlier by standardized blood tests to estimate renal function and monitoring of urine protein excretion. New drugs better control blood pressure and slow the rate of kidney damage by about 50 percent. An NIH education campaign informs patients and their doctors about the importance of early detection of kidney disease <http://www.nkdep.nih.gov/>.
- The disease pathways that cause damage to the kidney filter (glomerulus) are becoming better understood.
- Because kidney disease often runs in families, the NIH has carried out several genetic studies of kidney disease. Researchers are learning how to identify genetic markers that might predict who will get kidney damage, especially in African-Americans.
- As a result of improved treatment, the number of new dialysis patients has stabilized.
- The savings to Medicare for each patient who does not progress to dialysis is estimated to be \$250,000 per patient. Overall estimated Federal savings from recent improvements in preventing kidney disease is approximately \$1 billion per year.
- The Medicare program spends approximately \$24 billion per year for care of the over 525,000 U.S. patients with end-stage kidney failure. This represents nearly 6 percent of Medicare expenditures. Including the cost to other payors and out-of-pocket expenses, the total annual bill for treating kidney failure is over \$35 billion.

