



*Gervase of Ebstorf, 13th century*

# Clinical indicators and preventive care



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Over the past decade, improvements in ESRD care have been addressed by several organizations. Most notable is CMS's assessment of provider performance through its Dialysis Facility Compare project ([www.medicare.gov/dialysisfacilitycompare](http://www.medicare.gov/dialysisfacilitycompare)), which reports provider measures based on quality improvement targets and KDOQI published guidelines. The project is currently undergoing transition to a full web-based data entry system, which will include monthly laboratory data from providers. There have been challenges in implementing the system, but by the summer of 2013 most providers should be entering data. Until that time, some elements traditionally reported under the Clinical Performance Measures (CPM) program will not be up-to-date.

In Figure 2.1 we present data on KDOQI targets for dialysis therapy, vascular access, and clinical indicators, and look at other targets based on practice guidelines and safety issues. Dialysis adequacy has inched up slightly, with 95 percent of hemodialysis patients achieving a URR of  $\geq 65$  percent — a new high — and 87 percent of peritoneal dialysis patients achieving a  $kt/v$  of  $\geq 1.7$ . Forty-six and 51 percent, respectively, of diabetic ESRD patients received recommended glycemic control testing and lipid testing in 2011, while 65 percent of ESRD patients received an influenza vaccination.

Views of anemia treatment continue to evolve, as safety concerns about targeting hemoglobin levels above 11 g/dl have emerged from clinical trials. The new FDA label for ESAs, released in June, 2011, states "In controlled trials, patients experienced greater risks for death, serious adverse cardiovascular reactions, and stroke when administered erythropoiesis-stimulating agents (ESAs) to target a hemoglobin level of greater than 11 g/dL." The label also states that "No trial has identified a hemoglobin target level, ESA dose, or dosing strategy that does not increase these risks." The FDA recommends that clinicians "Use the lowest dose that will maintain a hemoglobin level sufficient to reduce the need for RBC transfusions." Based on new recommendations, these changes should reduce the risk of adverse cardiovascular events and strokes.

The new FDA recommendations and the concerns arising from clinical trials appear to be guiding clinical practice. At six months after initiation in 2011, the mean hemoglobin level in patients is now lower than its peak seen in 1999. And the mean ESA dose used to achieve these levels is below that of 1999.

Data on iron dosing practices show that, in the first six months of dialysis treatment, more than 50 percent of patients receive monthly IV iron, a new high. Another 20 percent receive IV iron in five of the first six months of dialysis therapy.





My soul is full of longing  
 For the secret of the Sea,  
 And the heart of the great ocean  
 Sends a thrilling pulse through me.

Henry Wadsworth Longfellow  
 "THE SECRET OF THE SEA"

Trends in the monthly percentage of patients receiving a transfusion have changed since 2010. Among hemodialysis patients, the transfusion rate, at 2.7–2.9 percent at the beginning of 2010, reached 3.3–3.8 percent in the first six months of 2012. Among peritoneal dialysis patients, the rate has increased from 2.3–2.9 to 3.0–3.9. Further analysis will be needed into how these changes might affect dialysis patients on the waiting list for transplantation.

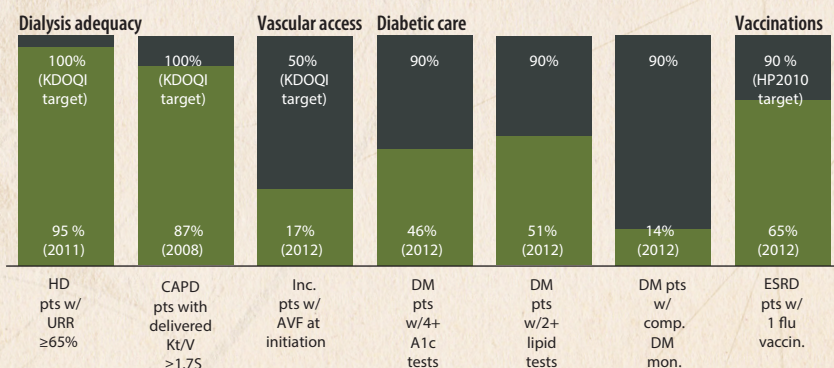
Comprehensive patient care has long been a focus of the ADR. Among diabetic patients, there has been a slight decline in the percentage of patients receiving recommended glycemic control testing and lipid testing, so that the overall rate of comprehensive diabetic monitoring has fallen from 17 percent in 2008–2009 to 14.4 percent in 2010–2011. It is not clear whether the new bundled payment system has had an impact on this aspect of patient care, or whether this decrease will have a collateral effect on diabetes-specific hospitalizations.

Influenza vaccination rates have risen from 46 percent in 2001 to 65 percent in 2011 — still below the HP2020 target of 90 percent. The percentage of patients vaccinated against pneumococcal pneumonia, peaking at 25.8 percent in 2008–2009 (reported in the 2012 ADR), has not improved, remaining at 25.6 percent in 2010–2011.

Vascular access has received increased attention since the release of data showing high catheter use at initiation and increasing rates of hospitalization due to infection in the first months of therapy. Unfortunately, the use of catheters at the start of ESRD remains high and relatively unchanged, at 81 percent. The CMS Fistula First program has worked to increase the use of arteriovenous (AV) fistulas, and to transition patients off dialysis catheters. Just 37 percent of 2011 incident hemodialysis patients, however, had an AV access either in use or maturing at the first outpatient dialysis treatment, up only slightly from 35.5 percent in 2007. In July, 2010, CMS began requiring the reporting of monthly data on vascular access use; as these data become available, the USRDS will examine prevalent access use and transitions in vascular access during the first months of dialysis.

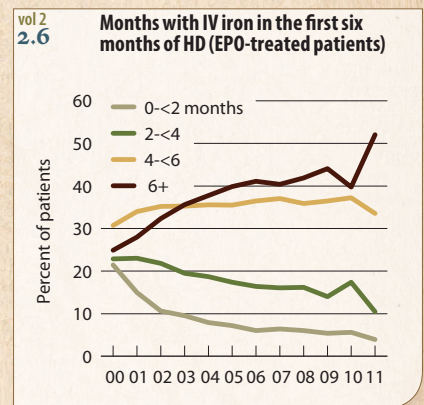
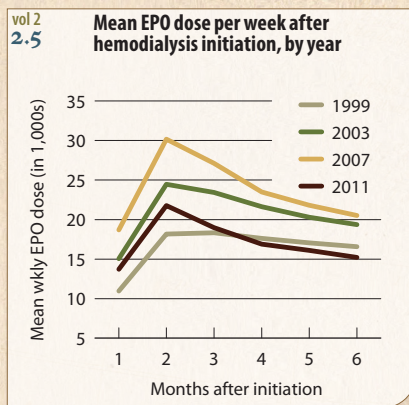
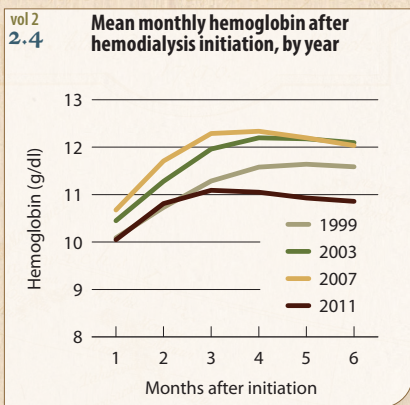
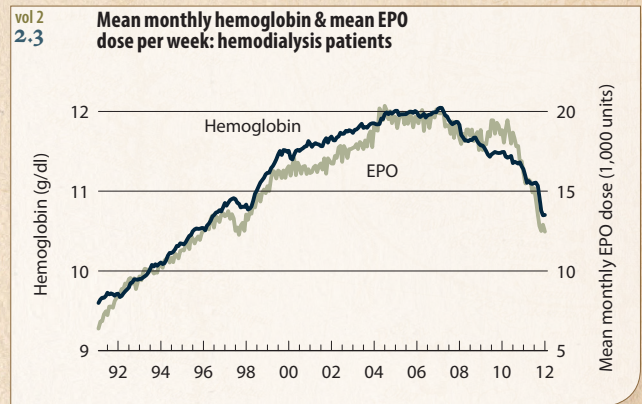
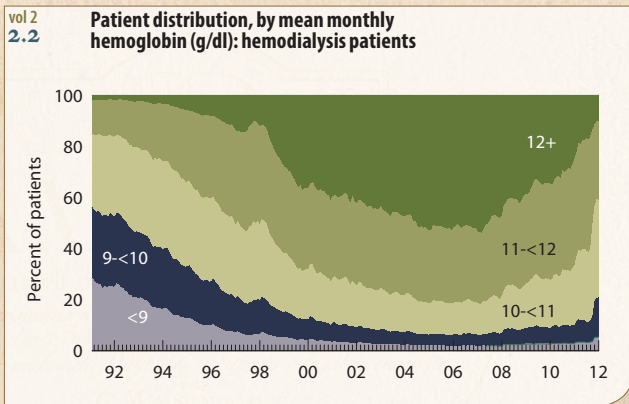
The lack of progress in the use of catheters is a major concern, and may relate to the persistently high rates of hospitalization for infection (noted in Chapter Three). The CDC restarted its infection control survey in 2012 and 2013, collecting data on unit practices related to access preparation for cannulation, on reuse practices, and on use of catheter antibiotic lock solutions. These practices will be assessed in the future to help guide targets for infection control and to reduce related complications. + **Figure 2.1;** see page 431 for analytical methods.

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 2.1 Quality indicators: percentage of patients meeting clinical & preventive care guidelines





At the end of 2011, 58 percent of prevalent hemodialysis patients had a mean monthly hemoglobin less than 11 g/dl, while 31 percent had hemoglobins that ranged from 11 g/dl to less than 12 g/dl. The mean EPO dose per week fell each month within the year, ending at 12,460 in the month of December, more than 3,600 units less than the average dose at the end of 2010; the mean hemoglobin at the end of 2011 was 10.7 g/dl. ♦ **Figures 2.2–3**; see page 431 for analytical methods. *Period prevalent hemodialysis patients.*

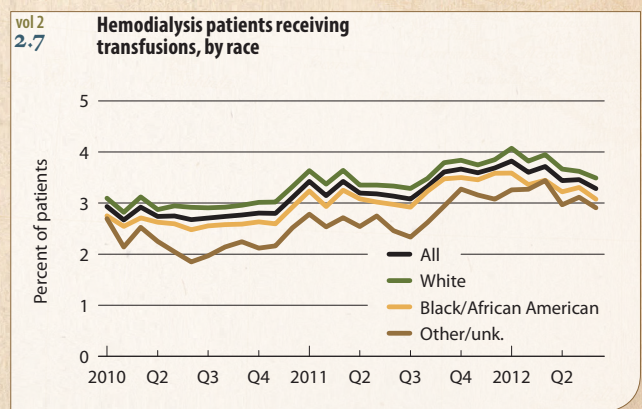


When compared to 2007, incident hemodialysis patients starting dialysis in 2011 did so with lower hemoglobins one month post-initiation, at 10.7 and 10.1 g/dl, respectively. In 2011, the mean hemoglobin level six months after initiation was slightly below 10.9 g/dl.

The mean EPO dose per week at six months after initiation was 15,213 units in 2011, compared to 20,506 units in 2007.

Between 2010 and 2011, the proportion of incident hemodialysis patients receiving IV iron in each of the first six months of dialysis showed a relative increase of 12 percentage points, to 52.1 percent.

The percentage of hemodialysis patients receiving a transfusion has increased little since 2010, and in June of 2011 was slightly higher in whites compared to blacks/African Americans, at 3.5 and 3.1 percent, respectively. ♦ **Figures 2.4–7**; see page 432 for analytical methods. *Incident hemodialysis patients; for Figure 2.7, each month includes patients with a claim for hemodialysis.*





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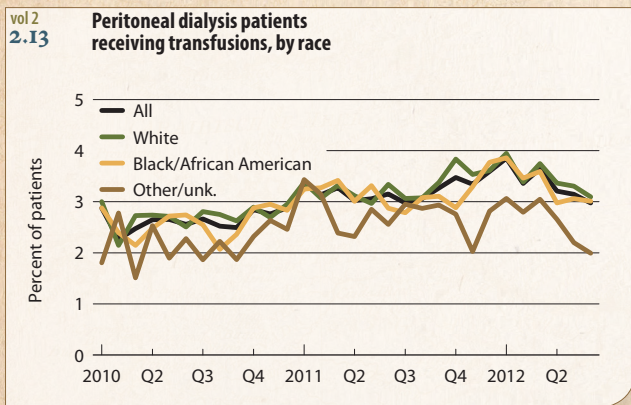
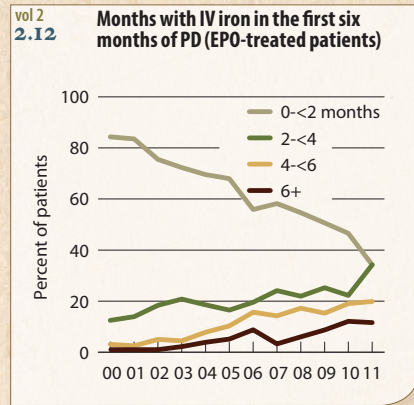
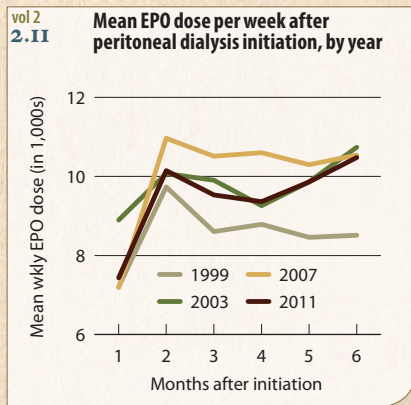
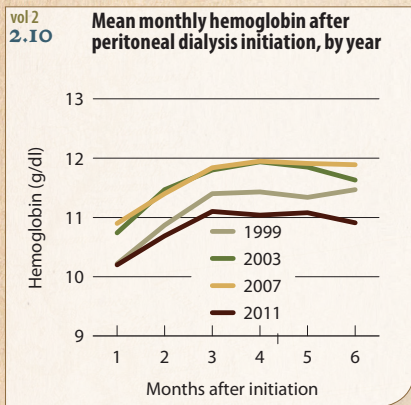
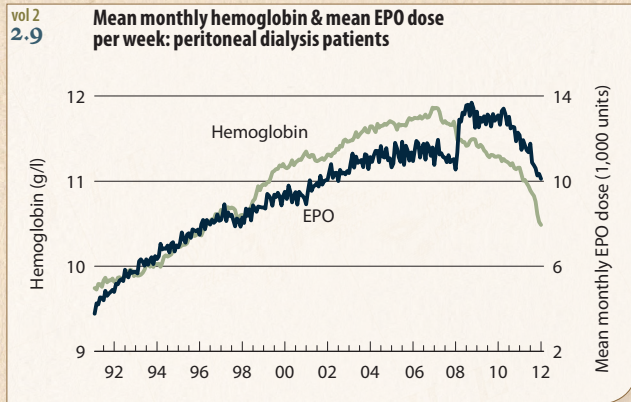
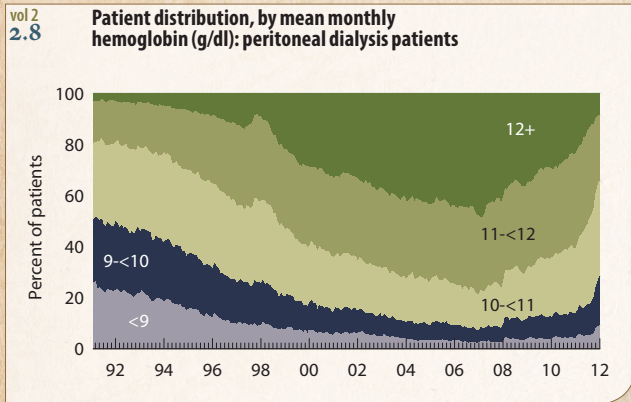
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At the end of 2011, 66 percent of prevalent peritoneal dialysis patients had a mean monthly hemoglobin less than 11 g/dl, while 26 percent had hemoglobins that ranged from 11 g/dl to less than 12 g/dl. The mean EPO dose per week fell each month within the year, ending at 10,104 units in the month of December, while the mean hemoglobin at that time was 10.5 g/dl. + Figures 2.8–9; see page 432 for analytical methods.

Period prevalent peritoneal dialysis patients.



When compared to 2007 patients, those starting peritoneal dialysis in 2011 did so with lower hemoglobins one month post-initiation, at 10.9 and 10.2 g/dl, respectively. In 2011, mean hemoglobin levels at six months following initiation were 10.9 g/dl. The mean EPO dose per week was 10,482 units, compared to 10,542 in 2007.

In 2011, the proportion of peritoneal dialysis patients receiving IV iron in each of the first six months of dialysis was 11.6 percent, in contrast to 32 percent among hemodialysis patients.

The percentage of peritoneal patients receiving a transfusion has increased little since 2010, and in June of 2011 was slightly higher in whites compared to blacks/African Americans, at 3.1 and 3.0, respectively. + Figures 2.10–13; see page 432 for analytical methods. Incident peritoneal dialysis patients; for Figure 2.13, each month includes patients with a claim for peritoneal dialysis.

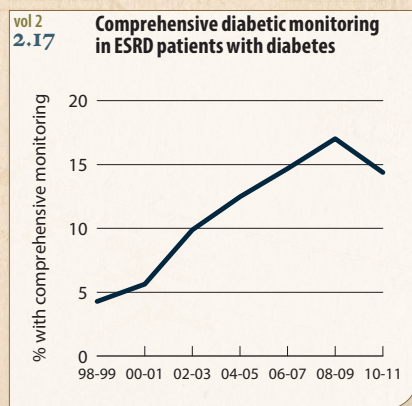
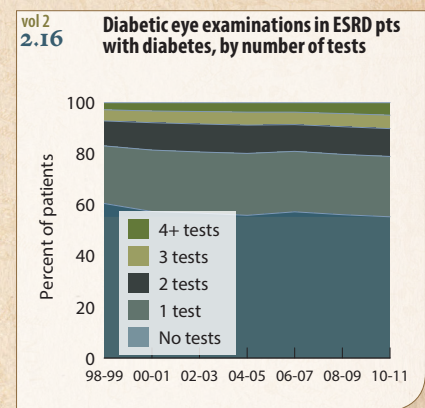
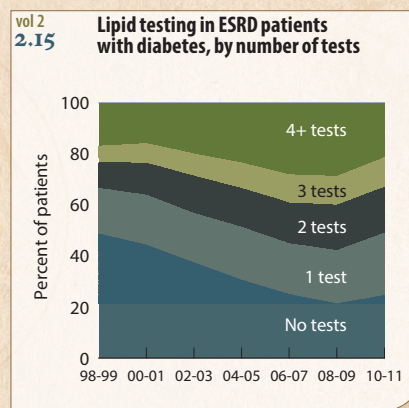
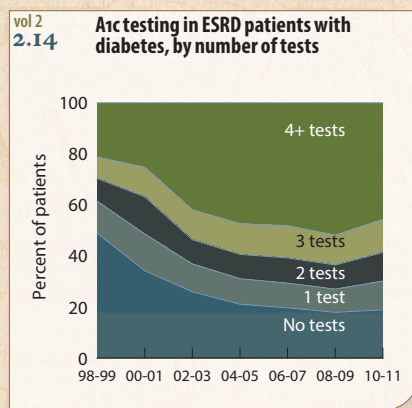


The American Diabetes Association recommends that patients with diabetes receive 2–4 glycosylated hemoglobin (A1c) tests per year, depending on changes in therapy and the attainment of treatment goals. In 2010–2011, 70 percent of diabetic ESRD patients received two or more A1c tests in a year, up from just 39 percent in 1998–1999 but down three percentage points from 2008–2009.

Patients with diabetes are generally predisposed to lipid abnormalities, putting them at risk for cardiovascular disease. Ideally, fasting lipid profiles should be measured at least once per year in normal adults, and more often in those with

high-risk lipid values. In 1998–1999, just 34 percent of ESRD patients with diabetes had at least two annual lipid tests; this improved to 51 percent in 2010–2011, but was eight percentage points lower than in 2008–2009.

While many patients with diabetes suffer from vision problems due to cataracts, glaucoma, or retinopathy, frequent eye examinations continue to be uncommon among ESRD patients with diabetes. In 2010–2011, only one in five received two or more tests in a year. + **Figures 2.14–16**; see page 432 for analytical methods. *Point prevalent Medicare ESRD patients with diabetes, age 18–75.*



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2.a **Vaccination rates (percent), by age, race/ethnicity, & modality**

	Influenza			Pneumococcal pneumonia			Hepatitis B (3 per year)		
	2001	2006	2011	2000-01	2005-06	2010-11	2011	2006	2011
0–19	18.0	30.2	39.2	4.0	8.2	13.9	0.5	0.8	1.5
20–44	33.7	45.1	56.8	8.2	16.6	22.9	3.0	3.5	4.4
45–64	43.7	54.1	63.4	9.7	18.9	25.6	3.7	5.0	5.8
65–74	53.6	61.5	66.9	11.6	21.3	26.6	4.8	6.4	7.3
75+	57.0	65.6	72.2	11.5	22.5	27.1	6.0	8.2	10.0
White	50.9	60.6	66.4	10.9	20.0	23.9	4.2	6.0	7.4
Blk/Af Am	41.8	52.7	62.6	9.5	19.7	26.8	4.0	5.2	5.8
N Am	35.8	52.5	67.1	11.2	22.4	31.1	3.7	5.0	7.1
Asian	45.5	56.1	66.0	8.0	16.8	24.4	2.9	3.6	4.7
Hispanic	43.7	53.4	65.2	9.0	18.9	27.5	5.0	6.2	7.0
HD	50.3	60.5	69.6	10.6	21.8	30.0	5.4	7.2	8.6
PD	41.0	53.2	66.7	9.6	19.2	25.6	3.6	5.3	7.0
Transplant	33.0	42.6	47.5	8.4	12.8	12.7	0.4	0.3	0.5
All	46.4	56.5	64.9	10.0	19.6	25.6	4.2	5.6	6.7

Comprehensive diabetic monitoring includes at least four A1c tests, two lipid profile tests, and one eye examination yearly. While the rate of comprehensive monitoring has been increasing over time, in 2010–2011 only 14.4 percent of prevalent ESRD patients with diabetes received this testing, three percentage points lower than in 2008–2009, when monitoring reached its highest point of 17 percent. + **Figure 2.17**; see page 432 for analytical methods. *Point prevalent Medicare ESRD patients with diabetes, age 18–75; monitoring tracked in the second year.*

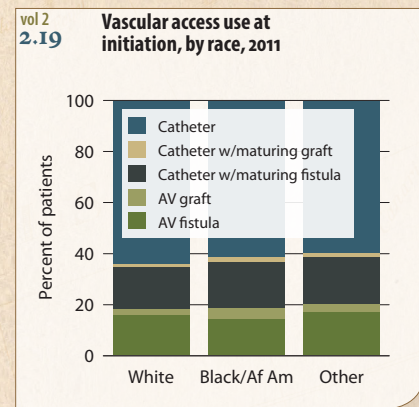
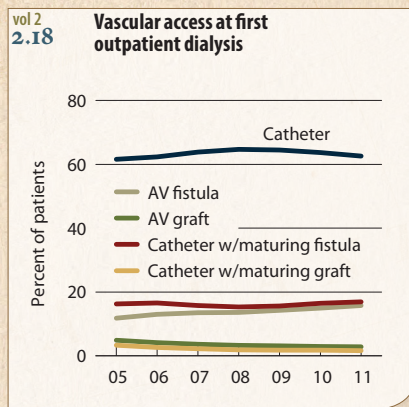
Rates of reported influenza vaccinations continue to improve overall, reaching 64.9 percent in 2011, yet remaining noticeably lower in children than in adults. By modality, rates were slightly higher in hemodialysis patients compared to peritoneal dialysis patients, at 70 and 67 percent, respectively; in 2011, 48 percent of transplant recipients received a vaccination. Overall, just over one in four ESRD patients received a vaccination for pneumococcal pneumonia in 2010–2011.

Dialysis patients should begin a series of three hepatitis B vaccinations soon after initiating therapy. The percentage receiving three vaccinations in a year remains low, with an overall rate of just 6.7 in 2011. + **Table 2.a**; see page 432 for analytical methods. *ESRD patients initiating treatment at least 90 days before tracking period: September 1–December 31 for influenza, a two-year period for pneumococcal pneumonia, & yearly for hepatitis B; patients alive on the period's last day, & vaccinations tracked during the period.*



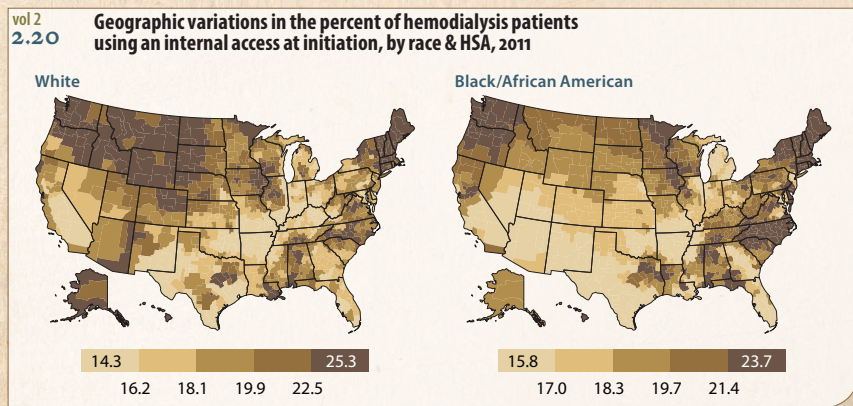
At the start of ESRD therapy in 2011, 63.7 percent of white hemodialysis patients were using a catheter alone, compared to 60.7 percent of blacks/African Americans and 59.3 percent of patients of other races. Arteriovenous fistula use at initiation was 16.1 percent in whites, 14.6 percent among blacks/African Americans, and 17.4 percent among patients of other races. + **Figure 2.19**; see page 432 for analytical methods. *Incident hemodialysis patients, 2011.*

At their first outpatient hemodialysis session, 62.6 percent of 2011 incident patients used a catheter alone as their vascular access — similar to rates in the previous two years. Eighty-one percent were using either a catheter alone or a catheter with a maturing arteriovenous fistula or graft. Sixteen percent of new patients now begin therapy with a fistula, compared to 12 percent in 2005. + **Figure 2.18**; see page 432 for analytical methods. *Incident hemodialysis patients.*



In 2011, 18–19 percent of white and black/African Americans starting hemodialysis did so with an internal vascular access. In the lower quintile, an average of 14.3–15.8 percent initiated treatment with an internal access; means in the upper quintile were 23.7–25.3 percent.

By location, patients residing in the Pacific Northwest, Midwest, and New England were the most likely to initiate dialysis with an internal access. + **Figure 2.20**; see page 432 for analytical methods. *Incident hemodialysis patients, 2011.*





## *anemia treatment*

MEAN MONTHLY HEMOGLOBIN IN HEMODIALYSIS PATIENTS AFTER INITIATION, 2011 (G/DL; FIGURE 2.4)  
month 1: 10.1; month 2: 10.8; month 3: 11.1; month 4: 11.1; month 5: 10.9; month 6: 10.9

MEAN EPO DOSE PER WEEK IN HEMODIALYSIS PATIENTS AFTER INITIATION, 2011 (UNITS; FIGURE 2.5)  
month 1: 13,710; month 2: 21,778; month 3: 18,974; month 4: 16,883; month 5: 16,105; month 6: 15,213

## *preventive care*

DIABETIC PATIENTS RECEIVING RECOMMENDED TESTING, 2010–2011 (TWO OR MORE TESTS IN A YEAR; FIGURES 2.14–16)  
A1c: 70%; lipid testing: 51%; eye examinations: 21%

### VACCINATION RATES, BY AGE (TABLE 2.A)

	0–19	20–44	45–64	65–74	75+
influenza, 2011	39.2%	56.8%	63.4%	66.9%	72.2%
pneumococcal pneumonia, 2010–2011	13.9%	22.9%	25.6%	26.6%	27.1%
hepatitis B, 2011	1.5%	4.4%	5.8%	7.3%	10.0%

## *vascular access*

VASCULAR ACCESS AT FIRST OUTPATIENT DIALYSIS, 2011 (FIGURE 2.18)

catheter: 63%; catheter with maturing AV fistula: 17%; catheter with maturing AV graft: 1.6%; AV fistula: 15.8%; AV graft: 2.9%

ARTERIOVENOUS FISTULA USE AT INITIATION, 2011 (FIGURE 2.19)

white: 16%; black/African American: 15%; other race: 17%