

# A Fistula is the Least Expensive Form of Vascular Access in Terms of Total Medicare Expenditures: A CPM Cohort Study

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## Introduction

- Clinical studies have shown fistulas to be the superior vascular access for hemodialysis (HD) patients.
- The National Kidney Foundation (NKF), in its Kidney Disease Outcomes Quality Initiative (K/DOQI) has set a target of at least 40% fistula use for prevalent HD patients; fistula use in other developed countries is often over 90%.
- Beyond the clinical advantages of using a fistula, little data is available on patients with fistulas and their associated Medicare costs compared to patients with grafts and catheters.
- Using the Centers for Medicare and Medicaid Services (CMS) Clinical Performance Measures (CPM) survey data, we studied total Medicare spending among HD patients with different vascular access types.
- Patients from two separate CPM/USRDS merged survey cohorts were chosen to better demonstrate the absolute and relative differences in expenditures among the three vascular access groups, both within and across years.

## Methods

- We selected patients from CMS annual CPM survey data which collects information each year on vascular access, anemia management, and dialysis adequacy in a random sample of 8,500+ in-center adult HD patients.
- Patients with Medicare as their primary payor from two specific CPM/USRDS merged survey cohorts were chosen for the study.
  - 1999: n = 5,862
  - 2003: n = 6,187
- We used an intent-to-treat model in which each patient was followed for one year from 1/1/1999 and 1/1/2003 respectively, and censored at dialytic modality change, transplantation, or death.
- CPM data element 'Current Access Type' was used to ascertain vascular access use in individual patients; patients with unknown or missing 'Current Access Type' were excluded from the study.
- Vascular access complication were determined using ICD-9 diagnosis codes 996.62 (infectious) and 996.73 (other).

## Results

- The use of fistulas has increased from 27.3% to 33.1%, while graft placements have dropped from 54% to 41.5%.
- Catheter use has risen from 18.7% to 25.4% between 1999 and 2003.
- Compared to patients age 65 and older, younger patients were more likely to have fistulas.
- Men were more likely to have fistulas, while African American women were more likely to have grafts.
- As expected, patients with diabetes were less likely to have fistulas.
- Patients with fistulas consistently had the lowest per person per year Medicare costs (\$43,703 & \$52,751), while catheter patients incurred the highest expenditures (\$61,341 & \$69,893) in both the 1999 and 2003 CPM/USRDS merged cohorts.
- Patients with fistulas were found to have the lowest admission rates for vascular access complications (0.12 & 0.12), while those with catheters had the highest (0.47 & 0.42).

Count and Percent (Row) of CPM/USRDS Merged Patients with Vascular Access Utilization, by Patient Characteristics (CPM Survey Years: 1999 & 2003)

	1999				2003			
	Fistula N/R.Pct	Graft N/R.Pct	Catheter N/R.Pct	Total N	Fistula N/R.Pct	Graft N/R.Pct	Catheter N/R.Pct	Total N
Age								
18-44	253/38.7	416/45.6	143/15.7	912	384/44.2	297/34.2	187/21.6	868
45-54	293/32.2	463/50.9	154/16.9	910	403/40.2	395/39.4	204/20.4	1,002
55-64	312/27.6	654/57.9	163/14.4	1,129	401/33.8	521/43.9	264/22.3	1,186
65-74	383/32.2	965/85.5	301/18.3	1,649	435/27.6	703/44.7	436/27.7	1,574
75+	298/20.5	666/52.8	337/26.7	1,261	432/34.2	690/41.7	483/31.0	1,503
Unknown	0	0	1/00.0	1	0	0	0	0
Gender								
Male	1,144/37.0	1,452/46.9	497/16.1	3,093	1,424/42.6	1,161/34.7	760/22.7	3,345
Female	453/16.4	1,709/61.9	599/21.7	2,761	629/21.9	1,405/50.4	814/28.6	2,842
Unknown	2/0.0	3/0.0	3/0.0	8	0	0	0	0
Race								
White	838/29.7	1,444/49.9	590/20.4	2,892	1,198/35.8	1,227/36.6	926/27.6	3,351
Black	518/22.7	1,378/60.3	369/17.0	2,265	652/28.2	1,121/48.5	540/23.3	2,319
Nat Am	55/42.0	54/41.2	22/16.8	131	49/41.2	53/44.5	17/14.3	119
Asian	61/32.8	103/55.4	22/11.8	186	74/37.8	85/43.4	37/18.9	196
Other	107/29.1	185/50.3	76/20.7	368	74/35.6	80/38.5	54/26.0	208
Primary Cause of ESRD								
DM	542/22.7	1,375/57.4	472/19.8	2,389	757/20.0	1,156/44.3	698/26.7	2,411
HTN	446/26.6	923/55.0	308/18.4	1,677	629/34.3	772/42.0	435/23.7	1,836
GN	304/37.9	383/42.8	115/14.3	802	314/43.7	256/35.7	148/20.6	718
Other	307/39.9	483/48.6	204/20.5	994	347/44.9	382/51.4	293/28.7	1,023
Total	1,999/27.3	3,164/54.0	1,099/18.7	5,862	2,047/33.1	2,566/41.5	1,574/25.4	6,187

## Conclusions

- Rates of fistula use are increasing but remain below the K/DOQI target.
- Hospital admissions for vascular access complications have decreased; HD patients with fistulas had the lowest hospital admission rates.
- Hospitalization expenditures for vascular access are decreasing (as a percent of total Medicare expenditures).
- A fistula is the least expensive form of vascular access in terms of total Medicare expenditures, \$43,703 and \$52,751 in 1999 and 2003, respectively.
- These estimates contain unmeasured co-morbidities, especially for patients with catheters.
- Because selection biases may confound the analysis, these results should be interpreted with caution.
- These data suggest that there are both clinical and economic benefits to the use of fistulas.

