



# CREATING A CULTURE OF QUALITY

## CathAway Fistula Vascular Access Program Achieves Improved Outcomes and Sets a New Standard of Treatment for End-Stage Renal Disease

*In this poster, we demonstrate the effectiveness of a quality improvement initiative to reduce central venous catheter use in hemodialysis patients.*

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### INTRODUCTION AND AIMS:

Hemodialysis patients using central venous catheters (CVC) for vascular access are at greater risk of infection and death compared to patients using arterial venous fistula (AVF) for access. The CathAway quality improvement initiative, a multidisciplinary program to reduce CVC use in favor of AVF, was implemented in 2008 within a large dialysis organization (LDO) in the US. To evaluate the efficacy of the CathAway initiative in reducing CVC use, patient outcomes before and after the initiation of the program were assessed.

### METHODS:

In this retrospective, observational evaluation of DaVita's CathAway program we examined CVC use among incident (< 90 days) and prevalent (> 90 days) patients receiving hemodialysis during each of the years 2006 to 2010. Outcomes included mean percentage of patients with CVCs, rate of new CVC placements per 100 patient-years, duration of CVC use and percentage of patient treatment days with CVC use.

### RESULTS:

We evaluated over 152,000 patient records. Among incident patients, CVC use within the first 90 days ranged between 76.2% and 79.7%; the rate of new CVC placement per 100 patient-years increased slightly between 2006 and 2010; duration of CVC use remained stable ( $53.0 \pm 27.8$  days, mean  $\pm$  SD, in 2006 versus  $53.2 \pm 28.3$  days in 2010); as did percent of treatment days with CVCs (70.4%–74.3%). Among prevalent patients, CVC use during the calendar year decreased by 18.5% over the study period, from 41.1% in 2006 to 33.5% in 2010; the rate of new CVC placement fell progressively from 64.8 per 100 patient-years in 2006 to 51.9 per 100 patient-years in 2010 (19.9% decrease); duration of CVC use declined by 19.3% from  $158.9 \pm 123.0$  days in 2006 to  $128.1 \pm 112.0$  days in 2010; and percent of treatment days with CVCs fell from 26.1% in 2006 to 16.5% in 2010, a 36.8% reduction.

### CONCLUSIONS:

CathAway, a comprehensive, large-scale quality initiative, decreased CVC use among prevalent hemodialysis patients by reducing both the rate of new catheter placement and the duration of CVC use. Improvements in predialysis care will likely be required to decrease CVC use among incident patients.



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## An Evaluation of Vascular Access and Mortality in the IMPACT™ Program

*In this poster, we show that a comprehensive on-boarding program for new hemodialysis patients reduced mortality and increased preferred vascular access use in the first year.*

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**Introduction and Aims:** IMPACT™ (Incident Management of Patients, Actions Centered on Treatment) is a clinical program designed to reduce mortality in incident hemodialysis patients by improving patient outcomes. The program was designed to address 4 key indicators of modifiable practice patterns known to be associated with lower mortality: anemia treatment, hypoalbuminemia prevention, dialysis adequacy, and preferred vascular access. IMPACT was initiated at DaVita clinics in October of 2007 and standardizes procedures for patient intake, education, management, and monitoring during the incident period. Due to a lack of knowledge of their underlying disease and failure to receive pre-dialysis treatment, a large majority of patients receive their first hemodialysis treatment with a central venous catheter (CVC), although an arteriovenous fistula (AVF) or arteriovenous graft (AVG) are the preferred methods for vascular access. The Dialysis Outcomes and Practice Patterns Study (DOPPS) has shown large international variations in vascular access practice patterns—with the US having higher rates of catheter and graft use than other DOPPS countries. Higher rates of morbidity and mortality are associated with the use of CVCs than the use of AVF or AVG.

**Methods:** This study is a retrospective, observational study of the effect of the IMPACT program on clinical outcomes and mortality among incident hemodialysis patients with end-stage renal disease (ESRD) at 44 participating DaVita dialysis clinics. A propensity score matched group of control incident patients was identified from facilities not participating in the IMPACT program. Patient demographic information was collected from all patients and included age, gender, Charlson Comorbidities Index (CCI) score, body mass index, primary cause of ESRD, and means of vascular access. Primary outcomes were the proportion of patients with a preferred access in place and mortality, compared between patients from IMPACT clinics and control clinics, which were measured quarterly—at the end of 90, 180, 270, and 360 days—over patients' first year of dialysis. Mortality rate was expressed as the number of deaths per 100 patient-years of treatment.

**Results:** At baseline there were no significant differences between the 1,231 IMPACT patients and 2,462 propensity-matched controls. At 90 days, 50.1% of subjects in the IMPACT group had a fistula in place when compared to 47.2% of those in the non-IMPACT group (not significant). By the end of the second quarter, IMPACT patients had a significantly higher proportion of a preferred access modality in use (0.60 versus 0.52 for non-IMPACT patients;  $P < 0.0001$ ). The proportion of patients with preferred access at the end of the third quarter was 0.65 for the IMPACT group and 0.52 for the non-IMPACT group ( $P < 0.0001$ ). At the end of one year, the proportion was 0.63 for IMPACT and 0.48 for non-IMPACT ( $P < 0.0001$ ). At all time points the IMPACT clinics had lower patient mortality rates than non-IMPACT clinics. At 90 days, patient mortality rates were 24.8 (95% CI 19.0-30.7) and 31.9 (95% CI 27.1-36.6) per 100 patient-years for the IMPACT and non-IMPACT groups, respectively ( $P = 0.07$ ). By Day 360, the mortality rate for IMPACT patients was 17.8 (95% CI 15.2-20.4) versus 23.0 (95% CI 20.7-25.2) in the non-IMPACT group ( $P < 0.01$ ).

**Conclusions:** A comprehensive hemodialysis patient on-boarding program can increase the use of preferred vascular access modalities and reduce mortality in incident hemodialysis patients.