



Impact of Network Quality Improvement Activities (QIAs)

The Networks serve all patients with ESRD and support all in-center and home dialysis providers, as well as kidney transplant providers, across the U.S. and its territories. Through the development and implementation of QIAs, each Network collaborates with a specific subset of facilities in their service area to improve targeted outcomes. These activities enrich the lives of kidney patients through a mix of clinical initiatives, quality of life improvements, and efforts to enhance continuity of care. Using prescribed quality improvement tools, the Networks conduct data analysis to develop robust improvement strategies. From January to September 2017, the ESRD Network Program QIAs included 5,426 out of 7,079 dialysis facilities, representing 76.6% of all dialysis facilities. That means that 343,650 out of 636,683 period prevalent dialysis patients in the U.S. and its territories (54.0%) were impacted over the course of the QIAs for the same time period. While some QIAs require several cycles before substantial progress is made and sustained, other QIAs make an immediate positive impact on the ESRD population.

Below are just three highlights from the Networks' achievements in 2017. Through facility implementation of Network QIA interventions, 10,394 patients were positively impacted by either catheter removal, reduced bloodstream infection (BSI) rates or prevented involuntary discharges (IVDs). In addition, there were 343,650 period prevalent patients in the LTC and BSI facilities QIA facilities, and 1,431 patients that at-risk for an IVD, that benefited from process and policy changes, implementation of best practices, and enhanced patient and family engagement activities that improved overall facility care in the QIA facilities. These interventions also reduced Medicare ESRD costs during and after 2017 by more than \$199 million dollars.



Long-Term Catheter (LTC) Reduction

Given the well-documented higher risk of LTC use¹, the Networks' interventions are true life-impacting work. They also produce impressive cost savings to the CMS Medicare ESRD Program.

In 2017, the Networks implemented facility-level, targeted interventions based on the results of root cause analyses (RCAs) and plan-do-study-act (PDSA) cycles. All 18 Networks reduced use of LTCs by the end of the QIA time period. While the interventions took many forms, the majority focused on patient education, patient rights, empowerment of the patient and family, and establishing facility processes for sustainable improvement.

An estimated 7,823 (27.1%) patient lives were positively impacted with a cost savings to CMS of \$140.8 million as a result of the Networks' catheter reduction QIAs.

Guidelines for vascular access management highlight the elevated risk of infection and mortality from the use of LTCs. The annual cost for outpatient treatment of an LTC patient can be up to \$25,000 more than for a patient with an arteriovenous fistula (AVF) access, with the average cost difference between a catheter and a graft or fistula being approximately \$18,000.² Hospitalizations due to catheter-related infections are also a major cost to the healthcare system and will be addressed in the section on BSIs.

Two-thousand eight hundred and fifty-four out of 7,079 facilities participated in the ESRD Network LTC Reduction QIAs, representing 40.3% of the ESRD facilities nationally. Over the course of the QIA project, January to September 2017, there were 262,965 as period prevalent patients were positively impacted by overall facility improvements, such as implementation of CDC guidelines. In January

¹ Rehman R, Schmidt R J, Moss A H. Ethical and Legal Obligation to Avoid Long-Term Tunneled Catheter Access. *CJASN*. 2009; 4 (2) 456-460.

² United States Renal Data System. *2010 USRDS Annual Data Report: Epidemiology of Kidney Disease in the United States*. Bethesda, MD: National Institute of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2010.



2017, 28,873 patients were classified as LTC, meaning they were listed as “catheter only” for 90 days or greater in CROWNWeb. At the end of the project period in September 2017, 22,186 of the original 28,873 patients were still dialyzing, but 7,823 were converted to a permanent vascular access. This is a 27.1% improvement in the QIA cohort patient population for LTC.

The cost of dialysis per year for an LTC patient is approximately \$90,000. The cost for a patient dialyzing with a permanent access is approximately \$72,000 per year, a difference of \$18,000.³ The 7,823-catheter reduction achieved as a result of the 2017 QIA interventions, therefore, represents a cost savings to CMS of approximately \$140 million. Additionally, there is indication that QIA interventions and education spread outside of the QIA facility pool. During the same time period of January to September 2017, the national ESRD program, as a whole, experienced a decrease in LTC use by 13,831 in the period prevalent dialysis population. The lives of almost 14,000 patients were positively impacted with the additional benefit of a cost savings to CMS of \$248.9 million.

Nationally, 13,381 (30.1%) patient lives were positively impacted with \$248.9 million in cost savings to CMS due to the Networks’ interventions and education- reaching farther than the catheter reduction QIA facilities.

³ United States Renal Data System. *2010 USRDS Annual Data Report: Epidemiology of Kidney Disease in the United States*. Bethesda, MD: National Institute of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2010.



BSIs Prevented

Infections contribute a very real threat to the length and quality of life for ESRD patients due to their increased risk for acquiring HAIs, specifically BSIs, due to the regular and frequent use of CVCs and other forms of access to their bloodstream while dialyzing⁴. Data indicate that patients with a BSI have an attributable mortality of 12.0–25.0%.⁵ Additionally, the financial cost of treatment and possible hospitalizations associated with catheter line-acquired BSIs ranges from \$3,700 to \$28,000 per patient, per episode.⁶

The Networks worked with 1,360 of 7,079 dialysis facilities nationally (19.2%) in 2017, to reduce BSIs. At baseline of the QIA in January 2017, there were 6,285 BSIs nationally, representing a cost of an estimated \$99.6 million, or \$15,850 per BSI episode. By the conclusion of the QIA at the end of September 2017, there were 3,879 BSIs, a reduction of 2,406 BSIs (38.3%) over the nine-month QIA period. Using the midpoints for cost, this effort demonstrates a cost savings to CMS of an estimated \$38.1 million. The QIAs, by increasing awareness and educating both facility staff and patients, directly impacted the quality of life for patients.

⁴ Centers for Disease Control. Dialysis Safety, 2018. Available at: <https://www.cdc.gov/dialysis/index.html>. Accessed on: October 24, 2018.

⁵ Srinivasan A, Wise M, Bell M, et al. Vital Signs: Central Line--Associated Blood Stream Infections -- United States, 2001, 2008, and 2009. *Morbidity and Mortality Weekly Report*. 2011; 60(08): 243-248.

⁶ Scott II RD. The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention (Publication No. CS200891-A). Available at: https://www.cdc.gov/hai/pdfs/hai/scott_costpaper.pdf. Accessed on: August 27, 2018.



An additional outcome of the QIA was increased collaboration between the Networks and with stakeholders, including hospitals, Quality Innovation Networks-Quality Improvement Organizations (QIN-QIOs), large dialysis organizations (LDOs), and patient subject matter experts (SMEs).

Individual highlights from Network BSI reduction QIAs can be found on page 16 of this report.

Involuntary Discharges Averted

According to the ESRD Conditions for Coverage (CfCs) and the CMS definition of an IVD, a facility may IVD a dialysis patient, leaving him or her without an outpatient facility to provide weekly dialysis. An ESRD patient who is unable to dialyze in an ESRD dialysis outpatient setting must be evaluated in a hospital emergency room for acute dialysis treatment at a substantial increase in cost and at a detriment to his or her life expectancy.⁷ The Networks are often able to avert an IVD by educating both patients and staff on de-escalation techniques, the importance of patients' perceptions, coaching of patients through understanding of facility procedures, and through investigation and issue resolution.

The average estimated cost of outpatient dialysis per patient, per year is approximately \$88,700. The estimated cost of emergency dialysis provided by a hospital in 2017 was \$342.5K per year,⁸

Each averted IVD equals approximately \$253,800 per year in savings to CMS.

In 2017, the Networks averted 165 IVDs or placed patients in another facility, resulting in a savings of \$20.9MM.

⁷ Cervantes L, Tuot D, Raghavan R, et al. Association of Emergency-Only vs Standard Hemodialysis With Mortality and Health Care Use Among Undocumented Immigrants With End-stage Renal Disease. *JAMA Intern Med.* 2018; 178(2):188–195.

⁸ Cervantes L, Fischer S, Berlinger N. The Illness Experience of Undocumented Immigrants With End-stage Renal Disease. *JAMA Intern Med.* 2017; 529-535.



an increased cost of \$253,800. Taking into consideration that not all IVDs are averted early in the year and therefore the savings are not for a full year, the NCC calculated potential savings at \$126,900 per patient, per year.

In 2017, the 18 Networks responded to 1,431 reports of patients being at-risk to an access-to-care issues, as well as assisting to avert 61 of the 499 IVDs that had been given a 30-day notice. According to data reported by the Networks in the Patient Contact Utility (PCU) in the patient status Post Discharge Follow-Up Disposition, an additional 104 non-averted patients were admitted to another outpatient facility, bringing the total number of averted IVDs to 165 at a cost savings to CMS of \$20.9 million.

In 2017, through the Networks' interventions in these three areas alone (LTC reduction, BSI prevention, and aversion of IVDs), 10,394 lives were positively affected specifically by BSI reduction, catheter removal or a prevented IVD, at a savings of \$199.8 million to the Medicare ESRD Program. There were 345,081 lives impacted by facility interventions that improve overall patient care.