



Reducing Infections and Improving Engagement
St. Luke's Nephrology Associates

Contact Information:

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Category: Vascular access safety/CLABSI Reduction policy and procedures
Type of Facility: Inpatient and Outpatient hemodialysis
Number of Patients: 293 HD patients and 41 Home patients
Number of Nephrologists: 16 nephrologists

Background

Patient safety has been at the forefront of our practice's mission. Accordingly, we have instituted or improved patient care pathways, coordinated and integrated care with other physician groups, nursing and other healthcare ancillary services. Four years ago, we were asked by St Luke's University Health Network to provide exclusive Nephrology services to the Network's Nephrology patients. This resulted in growth of the practice from 5 to 16 physicians and from 1 to 4 extenders. Additionally, we expanded services to three hospitals encompassing a total of seven hospitals. We understood that such significant expansion could dilute care and that specific goal directed measures were needed not only to maintain quality care but to put processes in place to ensure that quality was continually improved, measured and innovated upon. We also understood that physician engagement was key to a successful program and the best way to engage physicians was to ensure quality was at the forefront of our patient care.

In the past four years, St. Luke's Nephrology Associates has implemented a broad range of patient safety improvements to meet these goals, some of which has included focusing on reducing CLABSI infection rates, increasing vascular access rates to reduce catheter use, increasing CKD patient education, reducing post-operative acute kidney injury (AKI) in orthopedic patients and improving care coordination with primary care and other providers.

Reducing CLABSI

Central Line-Associated Blood Stream Infections (CLABSI) are associated with increased mortality, morbidity and increased health care costs. Bloodstream infections are a particularly dangerous complication of dialysis. Infections are the second most common cause of death in

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hemodialysis patients. In the U.S., approximately 370,000 people rely on hemodialysis care to sustain life. About 75,000 people receive their hemodialysis treatments through central line dialysis catheters. Central lines have a higher risk of infection than a fistula or graft. In 2013, it was estimated that one CLABSI costs \$45,814, considered the most costly Healthcare Associated Infection (HAI). Additionally, beginning in FY 2015, the Hospital-Acquired Condition (HAC) Reduction Program, mandated by the Affordable Care Act, requires the Centers for Medicare and Medicaid Services (CMS) to reduce hospital payments by 1 percent for hospitals that rank among the lowest-performing 25 percent with regard to HACs. CLABSIs are heavily weighted in this program.

In the first quarter of 2015, St. Luke's University Hospital Network (SLUHN) experienced a sudden and significant increase in blood stream infections related to central line dialysis catheters, highlighting a serious safety problem for their patients and organization, (i.e. six infections over a 3-month period compared to only one in the previous 2014 calendar year). The purpose of this project was to quickly identify the potential causes behind the sudden increase in dialysis catheter CLABSI infections. Recognizing the urgency of the problem, senior leadership was engaged and a Dialysis Task Force Team was created to identify root cause and develop patient-centric strategies using PDCA methodology.

Situation Prior to Interventions:

A detailed investigation of the six dialysis catheter infections was conducted immediately in March 2015 including type of therapy, type of line, line inserter, device day, insertion bundle compliance, machine #, access (flow) issues, and clinician performing hemodialysis/CRRT. No trend was identified. Commonality of specific organism was also assessed. Methicillin-resistant *Staphylococcus aureus*, methicillin-sensitive *Staphylococcus aureus*, and *Staphylococcus epidermidis* were the common organisms identified. We also considered volume of treatments and found a potentially contributing factor. Higher than normal volumes of hemodialysis treatments were performed in the first quarter of 2015, a 25 percent increase over the previous year's first quarter, (see Figure 1).

After the first dialysis catheter related CLABSI in January 2015, the following actions were initiated:

- The CLABSI team approved moving forward with a change to chlorhexidine (CHG) dressings for dialysis catheters as a means of meeting CDC standards for exit site care
- Monthly hand hygiene audits and access/deaccessing audits were initiated with hemodialysis staff

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Literature Review:

A complete literature review was conducted in April 2015 regarding infection prevention for both hemodialysis and CRRT via the two types of dialysis catheters, i.e. temporary and permanent. Evidence revealed that a core approach was indicated including: surveillance and feedback to front line staff, hand hygiene observations, catheter access/de-access care observations, minimizing disconnections, appropriate catheter valve disinfection, alcohol based CHG (>0.5 %) solution for skin antisepsis for insertion and dressing changes, antimicrobial ointment for exit site care, catheter reduction by addressing barriers to permanent vascular access (graft or fistula), staff education and competency, and patient education and engagement.

Benchmarking:

Baseline rate was established from SLUHN's 2014 calendar year (CY) performance. The organization had seven CLABSI with only one related to a dialysis catheter. The 2014 CY CLABSI rate was 0.28/1000 central line days which fell well below the Highmark Quality Blue Hospital Pay for Value benchmark of 0.65. St Luke's was performing above average.

The results from the 1st quarter of CY 2015 signified a significant rise in CLABSI rate (10 CLABSI with 6 related to a dialysis catheters and an overall rate of 1.52/1000 catheter days for the first quarter). At a cost of \$45,814 per CLABSI, our six dialysis catheter infections signified an estimated loss of \$274,884 in the first quarter alone, and additional financial penalties attached to exceeding third party payer benchmarks.

An initial meeting in March 2015 was called by Christina Zelko Bennick, Director of Patient Care Services and Dr. Gayner, Section Chief of Nephrology engaging key stakeholders from all departments involved in the care of dialysis patients. The Dialysis Task Force Team was initiated at this meeting.

Initially staff was engaged using human factor learning. Human factor learning examines the relationship between human beings and the systems they interact with by focusing on improving processes, efficiency, productivity and job satisfaction, with the goal of reducing errors. With each of the six CLABSI infections, the patient's story as related to the harm caused was reviewed with direct care stakeholders including all staff that touched the line (e.g. nurses and physicians from the emergency department, acute and critical care areas, interventional radiology, etc.). The team received valuable input from these clinicians that was used to identify root causes for the sudden increase in dialysis catheter infections.

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Determining Changes to Implement:

The Dialysis Task Force Team used the input from stakeholders, including direct care clinicians to develop the Dialysis Catheter-Related CLABSI Fishbone Chart (see Figure 2).

Changes Resulting in Improvement:

- Conducted observational walk-throughs in hemodialysis department in order to engage staff and assess practice related to catheter access/de-access, trouble shooting , cap changes, blood draw, blood culture draw, dressing changes, etc. (March 2015)
- Conducted observational walk-throughs in critical care units in order to engage staff and assess practice as related to Continuous Renal Replacement Therapy, CRRT (March 2015)
- Reviewed outpatient dialysis facility catheter “exit site care” (March 2015)
- SLUHN data revealed that we are below CMS’s goal of transitioning dialysis catheter access to fistulas, i.e. “Fistula First, Catheter Last” initiative → CLABSI information and access data presented to Dialysis Operations Committee (March 2015)
- Completed thorough literature review (April 2015)
- Reviewed notifications of dialysis catheter lines accessed for non-dialysis reasons and provided real-time counseling (April 2015 and forward)
- Tracked “present on admission” dialysis catheter infections to assess continuum of care partners and provide feedback (April 2015 and forward)
- Developed “Dialysis Catheter Related CLABSI” fishbone chart from the findings of the work above (see Figure 2)
- Assessed knowledge deficits and variation in TEGO® (dialysis catheter needleless valve) use between hemodialysis and CRRT (April 2015)
- Escalated implementation of change to CHG dressings for dialysis catheters (May 2015)
- Developed dialysis catheter dressing education for IR and Hemodialysis staff across the network and Critical Care areas that perform CRRT highlighting masking of patient and staff, and the change to CHG dressings (May 2015)
- Examined and compared existing policies and guidelines related to Hemodialysis, CRRT and accessing of dialysis catheters for non-dialysis reasons, noting areas in need of standardization and modification to meet evidence-based practice standards. Updated and/or created the following:
 - Hemodialysis Manual (completed July 2015)
 - Safety check
 - Access for initiation of hemodialysis
 - De-access/terminating hemodialysis
 - Troubleshooting hemodialysis flow issues
 - Obtaining blood cultures from hemodialysis machine
 - Blood withdraw from dialysis catheter upon initiation of hemodialysis

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- Tego® exchange
- CRRT Care Guidelines (completed November 2015)
 - Access for initiation of CRRT
 - Troubleshooting CRRT flow issues
 - De-access/Terminating CRRT
- Guideline for accessing dialysis catheters for non-dialysis reasons (completed July 2015)
- Accessing dialysis catheters to administer infusions and/or obtain blood samples
- Developed clinical competencies, provided staff education and conducted competency evaluations based on the updated policies and guidelines:
 - Hemodialysis staff
 - CRRT staff
 - Select staff accessing dialysis catheters for non-dialysis reasons
- Developed expectation to renew competencies annually (November 2015)

St. Luke's met and surpassed the goal to reduce CLABSIs related to dialysis catheters by 50 percent within 6 months and achieve sustained results over time. The infection control department will continue to monitor all positive blood cultures to determine if source is a CLABSI related to a dialysis catheter.

Financial Implications:

In the first quarter of 2016, we had zero CLABSI related to dialysis catheters vs. six in the first quarter 2015. Annual cost saving is estimated at \$274,884. Another financial component to be considered with reducing dialysis catheter-related CLABSI is avoidance of the Hospital-Acquired Condition (HAC) penalty. The six infection metrics listed in HAC account for 75 percent of the total HAC score.

Additional Patient Safety Activities

In addition to the CLABSI reduction efforts, St. Luke's Nephrology Associates established the first urgent care *peritoneal dialysis (PD)* program in our region. This has included coordination with the surgical and IR teams, PD nursing staff, and electronic health record (EHR) team to create order sets, creating patient and family educational materials and handouts. We have developed a PD dashboard to help monitor inpatient PD quality. This is in addition to outpatient quality which is already being monitored.

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In addition, St. Luke's Nephrology Associates developed a HD access dashboard which has highlighted issues regarding obtaining arm accesses for new HD patients. Catheter rates have decreased significantly (from ~20 percent to 15 percent). We have worked extensively with our Vascular Team and created pathways for improved access placement and functionality. We have created a dialysis patient demographic intake form which helps us collect data for our dialysis access dashboard. Initially we performed a deep dive data analysis to investigate causes for failure of initial dialysis arm access placement. We are also working on improved communication between our HD units and primary care physicians by improving EHR communication between our Allscripts EHR and DaVita's Falcon EHR and have initiated discussions with our newly developed network data warehouse resource to tap into our data sources to coordinate our CKD and ESRD population.

The nephrology team has worked with our Orthopedic/Anesthesia MD and nursing team to create hypotension protocols, alerts for discontinuation of NSAIDs with decreased GFR/ automatic outpatient evaluation of patients with CKD prior to elective orthopedic cases. Net result, AKI cases have decreased significantly. We are now looking to create pathways to decrease AKI incidence for other high risk areas such as post CABG and vascular surgery. We have revamped the ACR MRI contrast protocol to address both inpatient AND outpatient AKI risk and decrease rate.

St. Luke's Nephrology Associates has developed improvements in care for CKD patients by automating the CKD education process to ensure all office CKD Stage 4 and 5 patients receive CKD education. The protocol is as follows:

- The medical assistant (MA) prints the office patient list for the day and:
 - Identifies CKD Stage 4/5 patients
 - Checks if CKD Stage 4/5 patient has received Kidney Smart (KS) education
 - If patient has not received, MA marks KS on pre-visit paper
 - MA and physician review sheet during their pre-visit huddle
 - MA hands pre-visit sheet to checkout person
- Physician refers patient to receive Kidney Smart education
- Checkout confirms that CKD forms are completed
 - Checkout hands patient letter explaining KS benefit
 - Checkout faxes daily list of KS patients to the KS team
 - Includes complete recommendation letter with office site written top corner and patient address in the notes section
 - Checkout scans all paperwork into EHR
- KS team calls patient to schedule 1:1 or group session
- CKD Educator will give list of patients scheduled the day before scheduled visit
- Office staff will print last office notes for the CKD Educator for patients scheduled

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- KS team monthly sends KS data indicating:
 - Patient scheduled, patient complete status, class type, referring physician
- KS team sends letter documenting patient completed KS to Nephrology office
 - MA's scan into HER

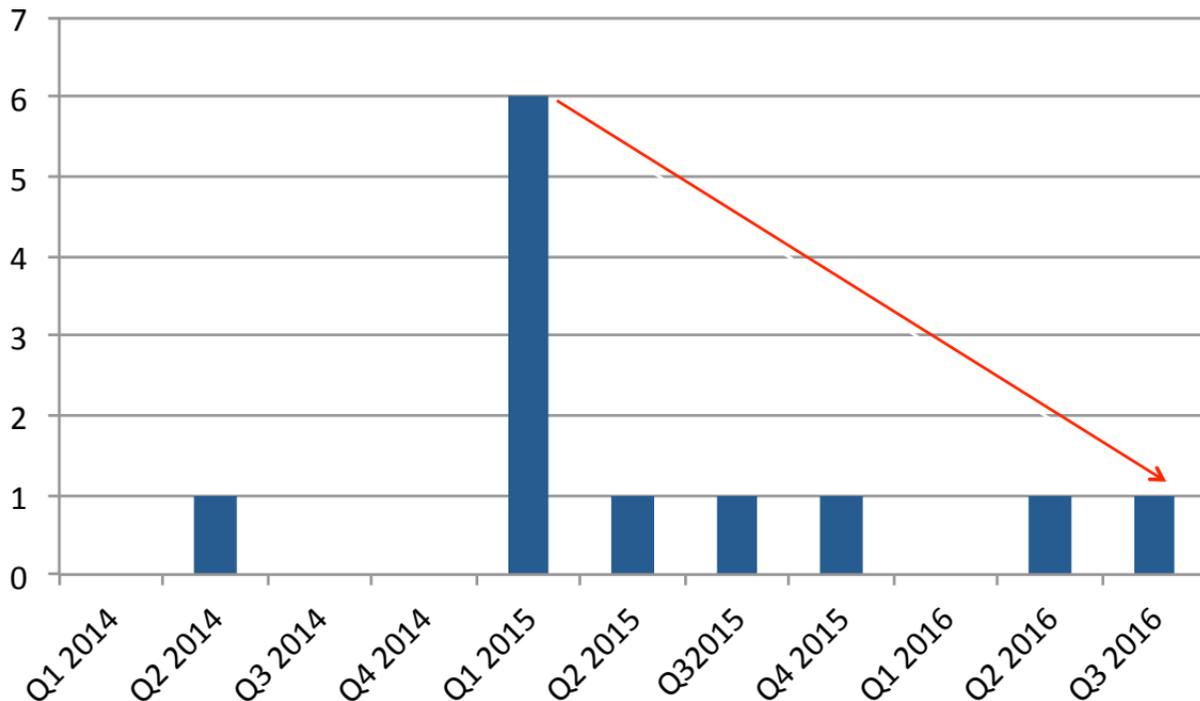
St. Luke's Nephrology Associates has also worked to engage patients in their care, including instituting one-on-one office visits for new HD patients so they can meet with the nephrologist who will be seeing that patient as part of their HD shift responsibility. This will help patients establish rapport with their physician as well as allow these patients to express any health concerns they may have in a more private setting. We also schedule advanced care office visits, for new start HD patients and targeted CKD patients, to discuss advanced care planning utilizing [5 Wishes](#) questionnaire.

Recommendations

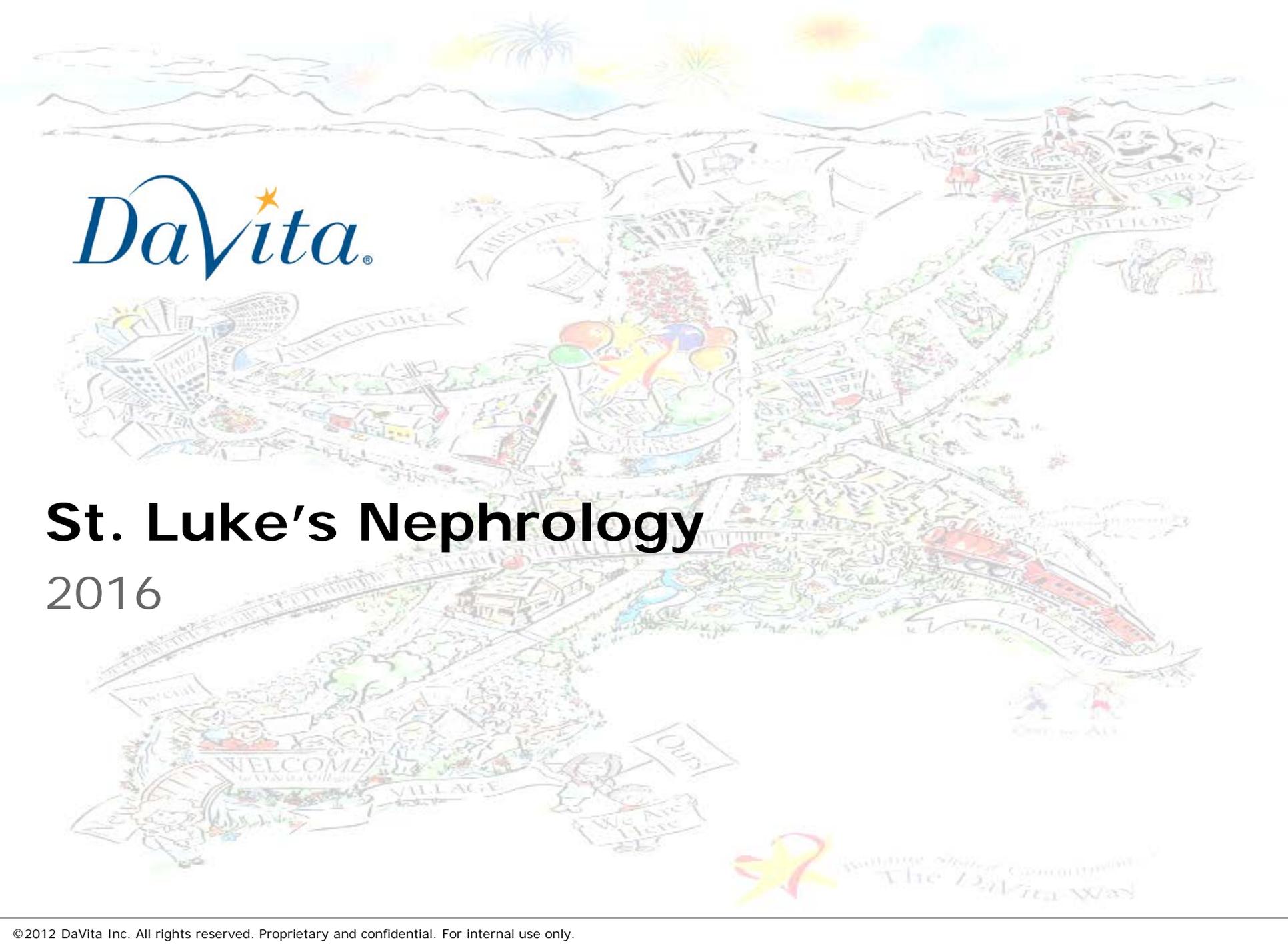
It is important to get everyone engaged prior to undertaking such endeavors. However, once this is accomplished the satisfaction from improving quality builds upon itself and motivates all. It is important to involve not just physicians but also nurse practitioners, physician assistants, nurses and hospital administrators to effect maximal change.



COUNT of DIALYSIS RELATED INFECTIONS



Note *Q2,Q3 2015, and Q2,Q3 2016 patients had multiple lines including dialysis catheter



DaVita

St. Luke's Nephrology

2016



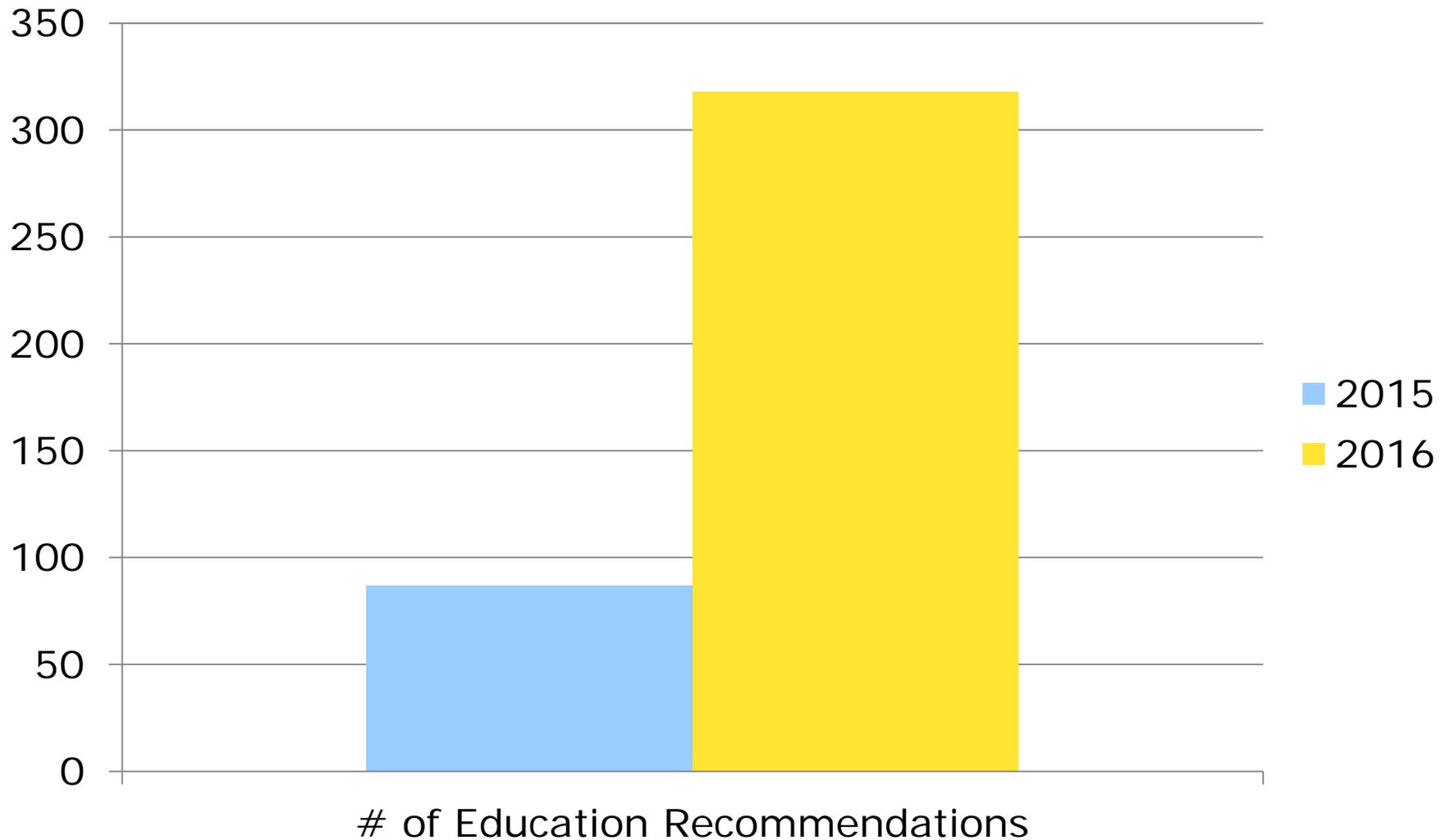
Building Strong Communities
The DaVita Way

Kidney Smart Commandments

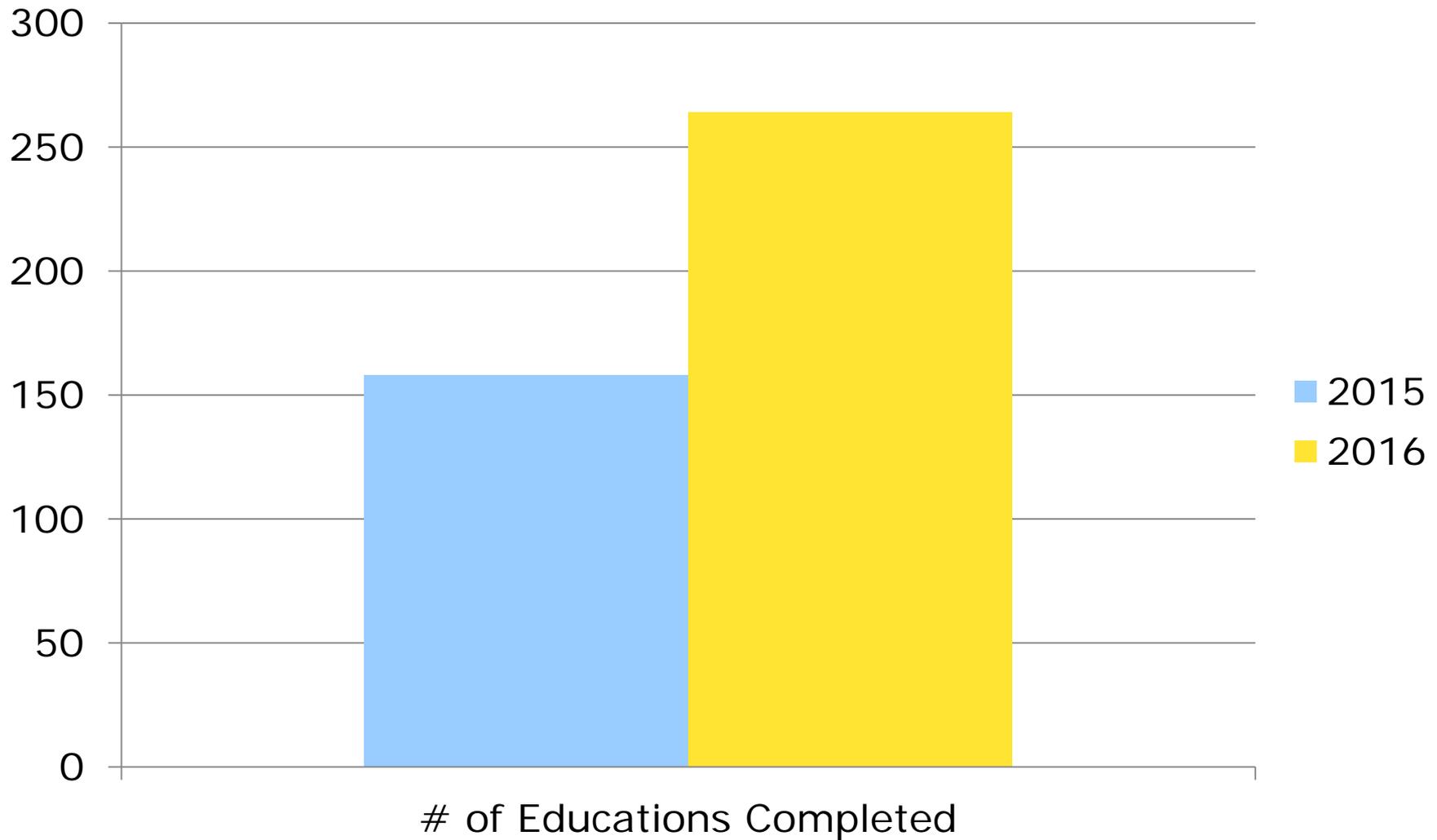


- This deck was prepared to review and discuss Kidney Smart, a community based CKD education program. Program success is measured using clinical and quality of life measures for program participants. Kidney Smart is not a growth program for DVA. All program participants have a choice in providers.**
- Outcomes are currently measured only for those patients that have chosen DVA as a provider because the Kidney Smart program has access to DVA patient data.**
- Educated patients make better health care decisions. When patients make better health care decisions, everyone (patients, providers, payers) benefits.**

The Number of Recommendations for Education 2015-2016



Number of Educations Completed for St. Luke's



St. Luke's Percent of New Starts Educated 2016



% of New Starts Educated

