

Improving Hemodialysis Adequacy by Decreasing the Percent of Patients for Whom Vascular Access is a Long-Term Catheter

Intermountain End-Stage Renal Disease Network, Inc.

ESRD Network #15

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Abstract

In 2001, the Intermountain End Stage Renal Disease Network, Inc., Network #15, initiated a quality improvement project titled, "Improving Hemodialysis Adequacy by Decreasing the Percent of Patients for Whom Vascular Access is a Long-Term Catheter." The project focused on the difficult task of improving hemodialysis adequacy by decreasing the number of hemodialysis catheters utilized for long-term (greater than 90 days) dialysis. The principal goals of the project were to achieve a URR \geq 65% in at least 80% of patients who used long-term catheters for dialysis, as well as to decrease the total percent of long-term catheters by referring patients for early intervention when permanent access function began to decline. The interventions for this project were multi-faceted. Each facility in Network #15 received an identical change packet containing a variety of resource materials to be used for the project. Based on highest catheter usage and/or lowest adequacy results, 40 facilities were identified for random assignment to either a more intensive intervention group (MIIG) or a less intensive intervention group (LIIG). Network Quality Improvement staff made on-site visits to the MIIG facilities to review facility-specific baseline data, including reasons for long-term catheter use and to discuss the contents of the change packet. Additionally, MIIG facilities participated in a stenosis-monitoring program and submitted monthly status reports to the Network. The findings from this project indicate a greater improvement in the MIIG facilities than in either the LIIG facilities or the Network as a whole. An increase in the percent of hemodialysis patients with adequate dialysis, a decrease in the percent of long-term catheter use and an increase in the percent of long-term catheter users with adequate dialysis were observed in the MIIG facilities.

Introduction and Objectives

Achieving a URR of \geq 65% in at least 80% of adult, in-center hemodialysis (HD) patients remains a goal for the 2000-2003 contract period.¹ Network #15 had achieved the "adequacy of hemodialysis" goal before beginning this project. On December 31, 1999, there were 10,843 persons with end-stage renal disease being treated with dialysis in Network #15; of this number, 89% (9,650 patients) received in-center HD. According to the 2000 ESRD Clinical Performance Measures Project (CPM) findings, the percent of HD patients in Network #15 receiving the recommended URR of \geq 65% had increased steadily from 57% in 1993 to 82% in 2000 (with 86% achieving a Kt/V \geq 1.2). Since all Networks were required to create a project to improve adequacy in the hemodialysis population, the Network #15 Medical Review Board (MRB) made the decision to focus on an important sub-group of patients for whom adequacy measurements had been less favorable. The MRB elected to attempt to improve the adequacy of dialysis for patients using long-term catheters as well as attempt to decrease the use of long-term catheters in patients for whom catheters might not be the only access option.

It is a Centers for Medicare & Medicaid Services (CMS) goal to have less than 10% of chronic maintenance HD patients using a permanent catheter for vascular access. This goal is based on the Kidney Disease Outcomes Quality Initiative (KDOQI) Vascular Access Guideline 30. The percent of HD patients in Network #15 using a long-term catheter access in the fourth quarter of 1998 was estimated to be 14%,² with an increase to 18% in the 1999 CPM sample. The state-specific rates of catheter use in Network #15 have been estimated to range from 16% (Nevada) to 25% (Arizona).³ As indicated by these rates, catheter use in Network #15 was above the suggested 10% goal, demonstrating an opportunity for improvement.

In Network #15 in 1998, only 47% of HD patients for whom a catheter was used as vascular access and 62% of those using a long-term catheter obtained a URR \geq 65% during dialysis. By December 1999, 75% of HD patients

using a catheter for dialysis received dialysis with a URR \geq 65%, and 78% of patients using a long-term catheter achieved this goal: an improvement but still below the target. Therefore, there was an opportunity to improve care for two subgroups of patients: those patients who had long-term catheters for whom fistulas or grafts may be medically appropriate, and those patients for whom a catheter was the only viable vascular access option but who were not receiving adequate dialysis.

The immediate outcome objectives of the project were to increase the percent of adult in-center HD patients with a URR \geq 65% and to decrease the long-term catheter rates in adult in-center HD patients. Project efforts targeted adult (\geq 18 years old) patients who had received in-center HD for \geq 6 months, hereafter referred to as “prevalent” patients. Efforts also targeted patients utilizing “long-term catheters,” those catheters in place for \geq 90 days. The interventions utilized in this project attempted to improve outcomes in both of these areas. The project aimed to improve dialysis adequacy for patients for whom presumably, a long-term catheter was the only viable permanent access option through dialysis prescription adjustments (e.g., by monitoring prescribed vs. delivered blood flow rate (BFR), time on dialysis and dialyzer type). The project discouraged the placement of catheters by encouraging monitoring for complications in existing fistulas and grafts and referring for early intervention to correct access problems when indicated.

Methods

In January 2001, a baseline data collection consisting of 100% of prevalent HD patients was conducted within the six states comprising Network #15. The information obtained from facilities included patient-specific data (URR results, access information and treatment parameters) and responses to a facility-specific survey detailing facility practice in the areas of adequacy and vascular access. A validation sample (n=404) was chosen randomly from the baseline data collection and a random sample of 447 records was validated at follow-up. Agreement rates (comparison of the data reported by the facilities and the data validated by the Network) were consistently above 86% except for two data items at baseline and three at follow-up. Catheter insertion date agreed 69.8% and catheter brand agreed 77.8% at baseline. At follow-up, delivered BFR agreed just under 86% (85.9%), while delivered time had an 81.4% agreement rate and insertion date 79.1%. Insertion date and catheter brand are difficult to obtain because facilities did not readily have this information on hand to validate. Reasons for this included: unavailability of operative and outpatient surgical reports, incomplete record keeping at the facility and incomplete dictation by the surgeon or radiologist. Facility staff reported that the brand name of the catheter was not included on any documentation at the facility and they “looked at the catheter” for the information. The facility staff was not able to report accurate dates for catheter insertion, as records were not forwarded from the hospital or outpatient clinic. In some instances, the date of insertion was recorded in the dialysis records as the date the catheter was initially used for dialysis at their facility. Concurrence rates (the proportion of patients classified in the same category for a measurement) were consistently at 96% or above. The validation results were well above the rates considered acceptable for the CPM data, 80% for agreement and 90% for concurrence. Additionally, statistics computed from the validated sample data were similar to statistics computed from the baseline data for the Network. For example, at baseline the proportion of patients with URR \geq 65% was 91.0% for the Network and 91.2% for the validated sample, and of the patients with access reported, the proportion with a catheter was 16.5% in the Network and 17.5% in the validated sample. Similar results were obtained at follow-up.

MIIG facilities for this project were chosen from the results of the baseline data collection. Candidates for the MIIG group had at least 20 prevalent HD patients. Forty facilities demonstrating the lowest percent of patients with a URR \geq 65% and/or highest percent of patients utilizing long-term catheters were identified. Twenty facilities were randomly assigned to the MIIG and twenty to the LIIG. These facilities were from five of the six states in Network #15. The following table describes the similarity of the two group’s outcome measures at baseline:

Project Indicator	MIIG (n=20 facilities)	LIIG (n=20 facilities)
Percent of patients achieving a URR \geq 65%	85.2%	84.2%
Percent of patients using a long-term catheter	20.7%	20.6%
Percent of patients using a long-term catheter with a URR \geq 65%	78.0%	77.5%

In March 2001, after baseline data collection of patient-specific and facility-specific information, every facility in Network #15 received an identical change packet containing a variety of resource materials aimed at both improving adequacy of dialysis and decreasing long-term catheter use. The resource materials included:

Quality Improvement Modules

Adequacy Issues in Hemodialysis*

Vascular Accesses for Hemodialysis*

*Used with permission of Fresenius Medical Care

Videos

Access Management - The AV Fistula (for staff/surgeon)

Access Management - The AV Graft (for staff/surgeon)

Living Well on Hemodialysis - Network 11 (for existing dialysis patients)

Vascular Access - Learning About Fistulas and Grafts (for pre-dialysis patients)

Vascular Access - Caring For Your Fistula or Graft (for existing dialysis patients)

DOQI Guidelines-Adequacy and Vascular Access

Algorithms for Vascular Access

In June 2001, facility-specific, state and Network aggregate results were distributed to each facility. The report, with established key baseline data for this project, allowed staff at each facility to compare their own achieved adequacy performance and catheter use practices, to those of their state and the Network as a whole.

Site visits for the twenty MIIG facilities were conducted July through September 2001. The following agenda was completed during the on-site visit:

- A PowerPoint presentation reviewing the baseline data collection results for the Network, state and facility; the K-DOQI recommendations for adequacy and vascular access; QI basics including root cause and Pareto analyses; and reasons why catheter use should be discouraged
- Review of the contents of the Resource Mailing
- Review of the Vascular Access Surveillance System (Vascular Access Algorithms, Vascular Access Referral Summary, Vascular Access History and Monthly Vascular Access Surveillance Record)
- An introduction to and demonstration of how to complete the Monthly Vascular Access Surveillance System
- Discussion of the plan for monthly reporting (e.g., due dates, reporting frequency, expectations)
- Identification of specific QI activities in the area of adequacy and vascular access based on facility-specific barriers
- Follow-up phone calls and follow-up data collections

Network facilities which met the project goals (>80% patients with a URR ≥ 65% and < 10% catheters during the baseline data collection effort) were interviewed regarding the strategies they had used to achieve their success. The information shared by these “benchmark facilities” was passed along to the MIIG facilities in the form of newsletters.

A follow-up data collection was completed in January 2002. The data items collected were identical to the baseline data items. Percentages were computed using Foxpro 2.6 and SAS 6.12. Confidence intervals were computed in Microsoft Excel using methods by Fleiss.⁴ Analysis was completed for the following indicators:

The indicators for the immediate outcome objectives: to increase the percent of HD pts with URR≥65% **and** decrease the prevalent patients using catheters are:

<i>numerator</i>	<u># prevalent HD patients with URR ≥65%</u>
<i>denominator</i>	# prevalent HD patients
and	
<i>numerator</i>	<u># prevalent HD patients using long-term catheter</u>
<i>denominator</i>	# prevalent HD patients

The indicators for the non-CPM clinical process objectives:

<i>numerator</i>	# prevalent HD patients with long-term catheters who receive the prescribed blood flow rate
<i>denominator</i>	<u># prevalent HD patients with long-term catheters</u>
and	
<i>numerator</i>	# prevalent HD patients with long-term catheters who receive the prescribed time on dialysis
<i>denominator</i>	<u># prevalent HD patients with long-term catheters</u>

The indicators for the long-term outcome objective: to increase & sustain the percent of in-center HD patients receiving adequate HD, shall be:

<i>numerator</i>	<u># prevalent HD patients with URR ≥65%</u>
<i>denominator</i>	# prevalent HD patients
and	
<i>numerator</i>	<u># prevalent HD patients using long-term catheter</u>
<i>denominator</i>	# of prevalent HD patients
and	
<i>numerator</i>	# prevalent HD patients with a long-term catheter and URR ≥ 65%
<i>denominator</i>	<u># prevalent HD patients with long-term catheters</u>

Results

Baseline and follow-up data are reported in tables 1-8, below, for the immediate and long-term outcome and non-CPM clinical process objectives for the project. For each objective, January 2001 and January 2002 data are displayed for the MIIG facilities, the LIIG facilities, and all facilities in Network #15. Presented are the rate, its 95% confidence interval, the absolute improvement (percentage point difference between baseline and follow-up data), relative improvement (difference between follow-up and baseline rate x 100 / baseline rate) and improvement relative to opportunity to improve (difference between follow-up and baseline rate x 100 / difference between baseline rate and best possible rate, i.e., 100% or 0%).

Table 1. Patients with URR \geq 65%					
Population	Rate	95% Confidence Interval	Absolute Improvement (Percentage Points)	Relative Improvement	Improvement Relative to Opportunity to Improve
MIIG 2001 (n=1,064)	85.2%	(82.9 – 87.3)	5.9	6.9%	39.9
MIIG 2002 (n=1,073)	91.1%	(89.2 – 92.7)			
LIIG 2001 (n=726)	84.2%	(81.3 – 86.7)	3.2	3.8%	20.3
LIIG 2002 (n=783)	87.4%	(84.8 – 89.6)			
Network #15 2001 (n=7,870)	91.0%	(90.3 – 91.6)	-0.3	-0.3%	
Network #15 2002 (n=8,620)	90.7%	(90.1 – 91.3)			

While for both MIIG and LIIG facilities the proportion of patients with URR \geq 65% increased, the change for MIIG facilities was statistically significant ($p < 0.05$), and their rate at follow-up was slightly higher than for the Network as a whole. The expected increase relative to the opportunity to improve (11%) was 2 percentage points. Although this expected increase did not materialize, the MIIG facilities did achieve the expected improvement of 2 percentage points greater than the improvement in the comparison facilities.

Table 2. Patients with Long-Term Catheter					
Population	Rate	95% Confidence Interval	Absolute Improvement (Percentage Points)	Relative Improvement	Improvement Relative to Opportunity to Improve
MIIG 2001 (n=1,133)	20.7%	(18.4 – 23.2)	4.1	19.8	19.8
MIIG 2002 (n=1,107)	16.6%	(14.5 – 19.0)			
LIIG 2001 (n=746)	20.6%	(17.8 – 23.8)	2.0	9.7	9.7
LIIG 2002 (n=799)	18.6%	(16.0 – 21.6)			
Network #15 2001 (n=8,407)	10.9%	(10.2 – 11.6)	-0.9	-8.3	
Network #15 2002 (n=8,944)	11.8%	(11.1 – 12.5)			

The MIIG facilities decreased their long-term catheter usage more than the LIIG facilities, although both remained greater than the Network. Relative improvement for MIIG facilities was double that for the LIIG group. Despite the modest absolute increase in long-term catheter use in the Network as a whole, the proportion of patients using a catheter did not change significantly.

Table 3. Patients with Long-Term Catheters Receiving Prescribed BFR (within 10 cc)					
Population	Rate	95% Confidence Interval	Absolute Improvement (Percentage Points)	Relative Improvement	Improvement Relative to Opportunity to Improve
MIIG 2001 (n=233)	68.7%	(62.2 – 74.5)	2.0	2.9	6.4
MIIG 2002 (n=184)	70.7%	(63.4 – 77.0)			
LIIG 2001 (n=154)	81.2%	(73.9 – 86.8)	-8.2	-10.1	
LIIG 2002 (n=148)	73.0%	(64.9 – 79.8)			
Network #15 2001 (n=911)	71.5%	(68.4 – 74.4)	-4.5	-6.3	
Network #15 2002 (n=1,050)	67.0%	(64.0 – 69.8)			

While the proportion of patients reported to have received the prescribed BFR increased slightly for MIIG facilities and decreased for LIIG facilities and the whole Network, at follow-up, MIIG facilities delivered the prescription more often than all Network facilities, but less than LIIG facilities. (If the delivered BFR was at least the prescribed BFR less 10 cc., the patient was counted as having received the prescribed BFR.)

Table 4. Patients with Long-Term Catheters Receiving Dialysis for Prescribed Time (within 5 min)					
Population	Rate	95% Confidence Interval	Absolute Improvement (Percentage Points)	Relative Improvement	Improvement Relative to Opportunity to Improve
MIIG 2001 (n=233)	93.1%	(88.9 – 95.9)	-2.3	-2.5	
MIIG 2002 (n=184)	90.8%	(85.4 – 94.4)			
LIIG 2001 (n=154)	94.8%	(89.7 – 97.6)	-4.2	-4.4	
LIIG 2002 (n=149)	90.6%	(84.4 – 94.6)			
Network #15 2001 (n=911)	93.4%	(91.6 – 94.9)	-3.6	-3.9	
Network #15 2002 (n=1,054)	89.8%	(87.7 – 91.5)			

Patients reported to be receiving dialysis for the prescribed time declined in every group, but at follow-up, approximately 90% of the patients were being dialyzed for the prescribed time. (If delivered time was at least the prescribed time less 5 minutes, the patient was considered to have received dialysis for the prescribed time.)

Population	Rate	95% Confidence Interval	Absolute Improvement (Percentage Points)	Relative Improvement	Improvement Relative to Opportunity to Improve
MIIG 2001 (n=232)	78.0%	(72.0 – 83.1)	8.4	10.8	38.2
MIIG 2002 (n=176)	86.4%	(80.2 – 90.9)			
LIIG 2001 (n=151)	77.5%	(69.8 – 83.7)	1.0	1.3	4.4
LIIG 2002 (n=149)	78.5%	(70.9 – 84.6)			
Network #15 2001 (n=886)	81.5%	(78.7 – 84.0)	1.7	2.1	9.2
Network #15 2002 (n=1,027)	83.2%	(80.7 – 85.4)			

While all groups increased the proportion of long-term catheter patients with URR_≥65%, the MIIG facilities had the greatest improvement, with a higher proportion than the Network as a whole, at follow-up, and well above the 80% threshold.

Of the individual patients who were identified in the facilities during the baseline and at follow-up data collections, Table 6 describes their catheter access conversion. Patients in the MIIG facilities had a higher rate of conversion to a permanent access (fistula or graft) than the LIIG facilities or the Network as a whole. There was a larger proportion of patients in the MIIG facilities who converted from a short-term catheter to a fistula than both the LIIG or the Network as a whole. Of all the patients who were using a catheter at baseline, those in the LIIG were the most likely to be using a catheter at follow-up.

	All Patients		MIIG Facility Patients		LIIG Facility Patients	
	Number	Percent	Number	Percent	Number	Percent
All Patients	761	100.0	179	100.0	110	100.0
Catheter to Catheter	469	61.6	107	59.8	76	69.1
Catheter to Fistula	142	18.7	40	22.3	18	16.4
Catheter to Graft	150	19.7	32	17.9	16	14.5
Long-Term Catheters (at baseline)	520	100.0	133	100.0	82	100.0
Catheter to Catheter	340	65.4	85	63.9	56	68.3
Catheter to Fistula	93	17.9	28	21.1	16	19.5
Catheter to Graft	87	16.7	20	15.0	10	12.2
Short-Term Catheters (at baseline)	241	100.0	46	100.0	28	100.0
Catheter to Catheter	129	53.5	22	47.8	20	71.4
Catheter to Fistula	49	20.3	12	26.1	2	7.1
Catheter to Graft	63	26.1	12	26.1	6	21.4

A facility-specific questionnaire was returned to the Network by 178 (of 191) facilities at baseline and 186 (of 200) at follow-up. There was improvement reported in many of the areas assessed. The perceived importance of patients having a fistula or graft increased over the project period: at baseline, 64.6% rated the importance of patients having a fistula or graft as 10 on a 10-point scale, 20.8% rated the importance 9, 10.1% rated it 8, and 4.5% rated the importance between 1 and 7. At follow-up, the rankings were higher: 75.8% rated the importance a 10, 14.5% a 9, 8.1% rated it 8, and the remaining 1.6% 7 or 5. More facilities reported reviewing reasons for catheter usage at least monthly at follow-up than at baseline. The proportion reporting reviewing their usage as needed decreased by 50% (from 28.9% to 14.1%) Most (81.7% at baseline and 84.7% at follow-up) said this review is done at care conferences, rounds, or monthly meetings, or by CQI or QA. Less than one facility in five has a vascular access coordinator, and 78.1% of them at baseline and 93.5% at follow-up had other responsibilities in addition to monitoring the status of HD accesses in their facilities. For those facilities without a vascular access coordinator, 38.4% at baseline and 51.6% at follow-up reported that an RN tracked information regarding catheter usage; 52.1% and 42.6%, respectively, either did not report who tracked this information or said that nobody tracked it.

Table 7. Facility-Specific Questionnaire

Descriptor	Baseline	Follow-Up
Number of facilities responding	178	186
Serves urban population	55.6%	56.5%
Importance of patients having fistula or graft = 10/10	64.6%	75.8%
Policy/Procedure for tracking vascular access that includes catheters or is specific to catheters	26.1%	42.7%
Review reasons for catheter usage regularly	79.8%	87.6%
Review at least monthly	68.3%	83.4%
Facility has vascular access coordinator	18.0%	16.7%
Patient teaching tool for vascular access	52.8%	71.0%

Table 8. Reasons Reported on Facility-Specific Questionnaire for Catheter Placement

Reason Ever Reported	Baseline	Follow-Up
Failure of initial fistula	83.7%	82.8%
Failure of initial graft	82.0%	84.9%
Patient preference/refusal to have fistula or graft	76.4%	79.6%
Infection of previous fistula or graft	67.4%	64.5%
Awaiting transplant	48.9%	48.9%
Poor BFR in previous fistula or graft	47.8%	57.0%
Difficulty cannulating previous fistula or graft	47.2%	55.9%
Medical complications	47.2%	51.1%
Diagnosed Steal Syndrome	45.5%	48.4%
Patient failure to follow through on post-operative care of access	36.5%	41.4%
Surgeon not available for timely access placement	32.0%	39.8%
Surgeon preference	27.0%	30.1%
Nephrologist preference	25.3%	22.0%
Cannulation technique of inexperienced staff	22.5%	30.1%
Financial reasons	12.4%	17.2%

Facilities were asked to identify reasons for catheter placement in their patients from a standardized list. The results are listed in Table 8. If the reason for catheter placement did not appear on the standardized list, the respondent was asked to write in the reason for catheter placement. The most common reasons indicated were: patient awaiting fistula or graft to mature; new starts with late referral to nephrologist; multiple failed fistulas or

grafts with no other sites available for access placement; poor vascular system; and multiple clotting episodes or unavailability of surgeon to declot access.

Conclusions

Before the project began, Network #15 exceeded the goal of 80% of HD patients achieving a URR of 65%, with 91.0% of patients having a URR of 65% or higher. In fact, both MIIG and LIIG facilities also exceeded the goal (with 85.2% and 84.2%, respectively.) While the Network essentially maintained the baseline level, both MIIG and LIIG facilities increased the proportion of patients with URR 65% or higher, with the MIIG facilities' absolute improvement exceeding the 2-percentage point higher gain than the comparison facilities. Improvement relative to the opportunity to improve was twice as great for the MIIG facilities as for the LIIG facilities.

Since Network #15's performance already exceeded DOQI guidelines for URR, a subgroup of patients, those with long-term catheters, were targeted for improvement of URRs. While these patients in the Network as a whole exceeded the target at baseline (81.5%), the MIIG and LIIG groups were under 80% (78.0% and 77.5%, respectively). The Network achieved a 1.7 percentage point (absolute) increase during the project, not quite achieving the projected 2-percentage point increase. The MIIG facilities improved 8.4 percentage points, improvement relative to the opportunity to improve of 38.2%, bringing the proportion of long-term catheter patients with URR 65% or greater to 86.4%, higher than the Network as a whole.

The Network also expected to decrease long-term catheter usage by 2 percentage points. At baseline, 10.9% of Network patients were reported to be dialyzing with long-term catheters. Rather than this percentage decreasing below the DOQI target of 10%, the Network's rate increased to 11.8%. Both the MIIG and the LIIG facilities decreased their long-term catheter usage from 20.7% and 20.6%, respectively. While the LIIG decreased their usage by 2 percentage points, the MIIG decreased theirs by double that amount. The improvement relative to the opportunity to improve for the MIIG was an impressive 19.8%.

For the two non-CPM process objectives--percent of long-term catheter patients who receive their prescribed blood flow rate and percent who receive the prescribed time on dialysis—results were disappointing, because with the exception of the MIIG facilities meeting BFR, the rates declined.

The Network as a whole declined in performance on 4 of the 5 indicators. This may be due in part to regression to the mean. Improvements will eventually reach a plateau and/or decline somewhat. The Network #15 performance on the outcome indicators is close to or above DOQI goals. The MIIG facilities improved on 4 of the 5 indicators and exceeded the one goal set for these facilities in the project plan: to increase the proportion of patients in the facility with $URR \geq 65\%$ by 2-percentage points more than in the LIIG facilities.

The project period saw improvements for the MIIG facilities and the LIIG facilities, which were identified at baseline as having the most opportunity for improvement. Improvements might have been even greater in the MIIG facilities, except for several barriers that were identified. One of the 20 MIIG facilities, with nearly 7% of all the MIIG patients, was involved in an NIH study that restricted modification of dialysis prescriptions, so their ability to improve their patients' dialysis adequacy would have been hampered. In one state, it became apparent that differences in opinion regarding which patients are eligible for obtaining a permanent vascular access preclude some patients from changing from a catheter to a fistula or graft, thus inhibiting their ability to achieve more effective dialysis. Additionally, in rural areas, the lack of access surgeons makes this conversion more difficult.

At the conclusion of the project, all facilities in the Network were asked to complete an evaluation form rating the materials in the project resource packet. While they were not required to identify themselves, we do know that one large MIIG facility and one small LIIG facility were among the 15.4% of respondents that reported that they either did not receive, did not have or could not locate the resource packet at the time they completed the evaluation. During on-site visits with each of the MIIG facilities, the resource packet was located and reviewed

with the facility representative. Overall, 25.5% of the Network facilities that responded said they had not reviewed or used the resource packet.

One hundred forty-nine (149) facilities returned an evaluation form to the Network. Of the respondents, 79.9% reported that they had an adequacy tracking/monitoring program before beginning the project. Of the remaining facilities, 63.0% said they plan to begin one now. Ninety-seven respondents (65.1%) said they had a vascular access tracking/monitoring program prior to the project, and of the other facilities, 58.0% reported that they plan to begin one now.

Of the 149 facilities that sent in their evaluations, 17.5% said the videos were the most valuable resource, 10.7% liked the QI Modules best, and 6.7% preferred DOQI Guidelines. The remaining 66% of the facilities did not respond to this question on the evaluation.

Facilities were asked to rank the usefulness of the resource materials on a scale of 1 (least useful) to 5 (most useful). In ranking their usefulness, each of the QI Modules and Videos were reported to be useful (ranked 4 or 5) by about 66% of the facilities that ranked them and DOQI Guidelines were ranked 4 or 5 by over 75% of respondents: Adequacy Issues in Hemodialysis (61.5% of 104 respondents), Vascular Accesses for Hemodialysis (65.4% of 104), Living Well on Hemodialysis (69.5% of 95), Access Management – The AV Fistula (66.3% of 98), Access Management – The AV Graft (64.6% of 96), Vascular Access – Learning About Fistulas and Grafts (67.7% of 93), Vascular Access – Caring For Your Fistula or Graft (69.9% of 93), DOQI Adequacy Guidelines (78.5% of 107) and DOQI Vascular Access Guidelines (77.6% of 107 respondents). Only 5% (2.1-4.8%) of these respondents said the Modules and Videos were not useful (1 or 2), and no one said DOQI was not useful. Of all 149 respondents, 24.2-24.8% said they use each of the Modules and videos, another 22.8-28.2% plan to use them and nearly half did not report whether they use or plan to use the Modules and videos. The DOQI Guidelines were used by 40.9-43.0% of the respondents, another 16.8-18.1% plan to use them and 40% did not respond. One of the barriers to implementing these resources may have been communication. The lack of response may have been due to the respondent not knowing about the project, the responsible staff (Nurse Manager and/or Administrator) being new to the facility or the facility being new.

In summary, the resource packet materials were regarded as helpful. The project was successful, as greater improvements were seen in the MIIG facilities than in the LIIG facilities or the Network as a whole. The minor decline in Network results may be due to regression toward the mean, lack of buy-in to the project by facilities and Nephrologists or due to the need for further patient education.

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