

"Vascular Access Management...Instituting Hospital System Change"

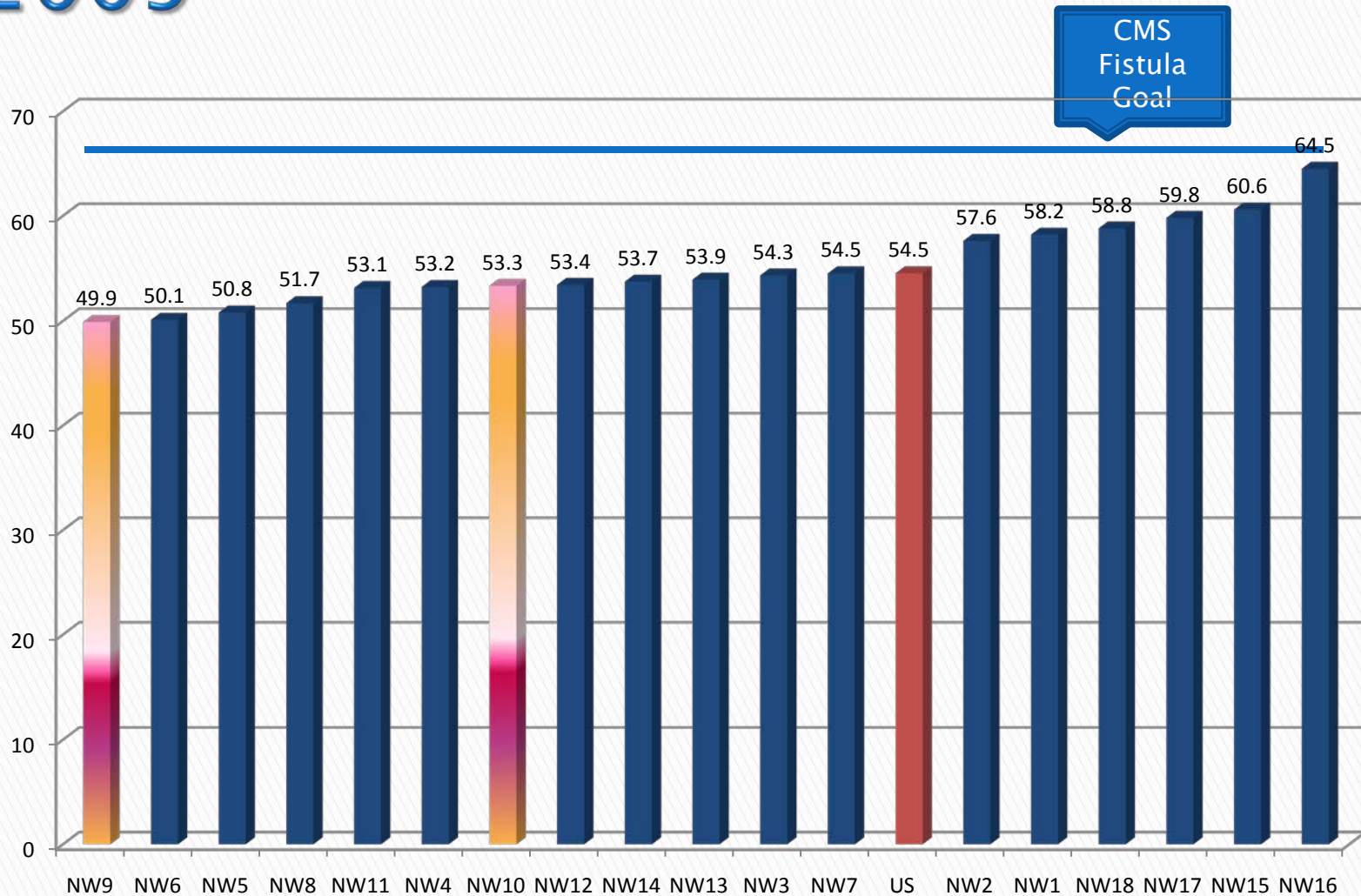
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Introduction

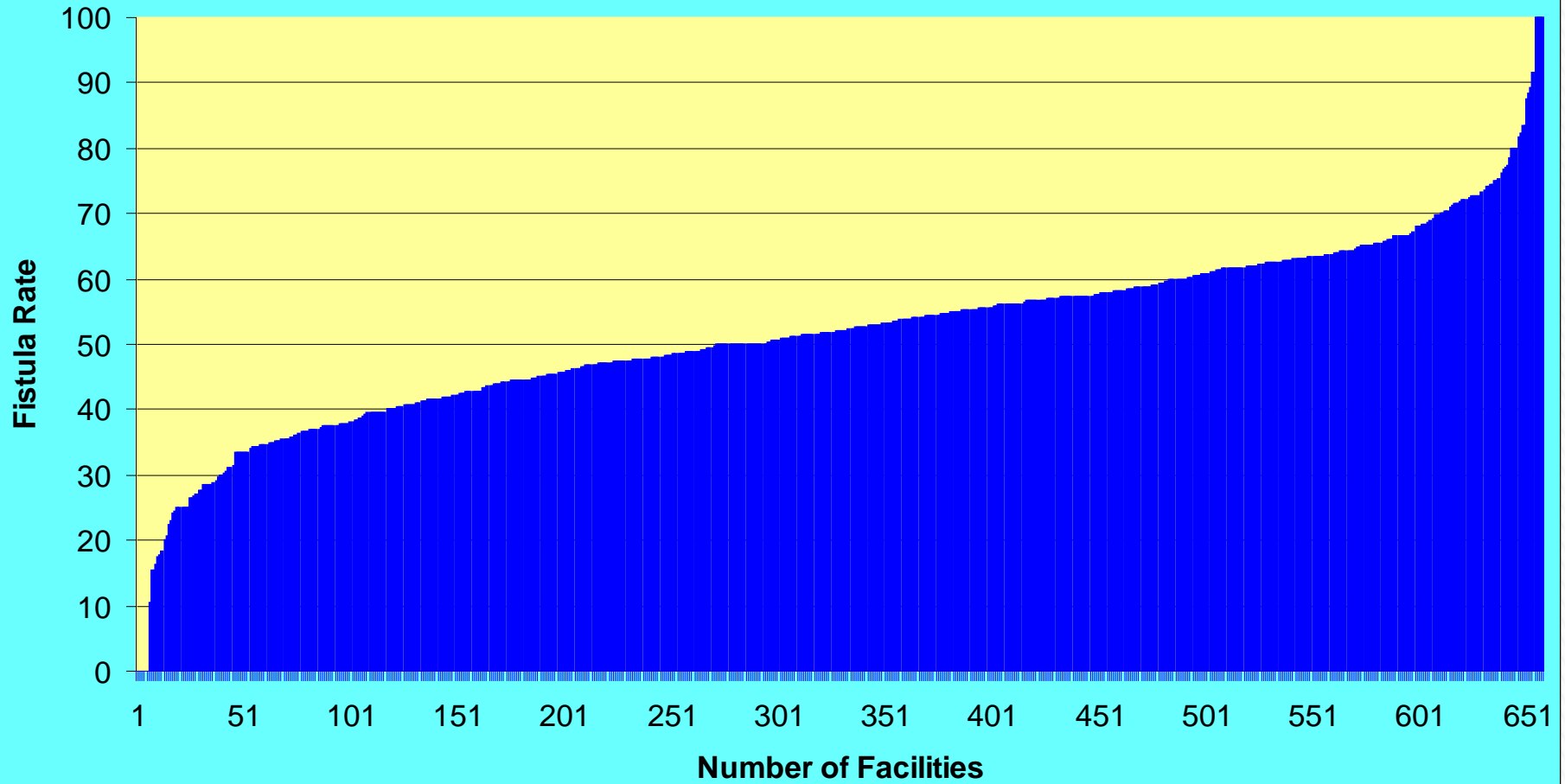
- Over 561,000 patients are treated yearly for ESRD in the USA; 60% of these patients receive some form of hemodialysis
- Despite major advances in dialysis knowledge and technology, ESRD patients continue to suffer from the debilitating effects of renal disease, and die prematurely
- **Vascular access failure represents a major source of morbidity in ESRD patients**
 - 25% of all hospital stays for ESRD pts are related to problems with vascular access
 - ~500,000 vascular access procedures/year in US;
 - COST: >\$200 million/year

Proper selection, creation, and maintenance of vascular access in ESRD pts cannot be overemphasized

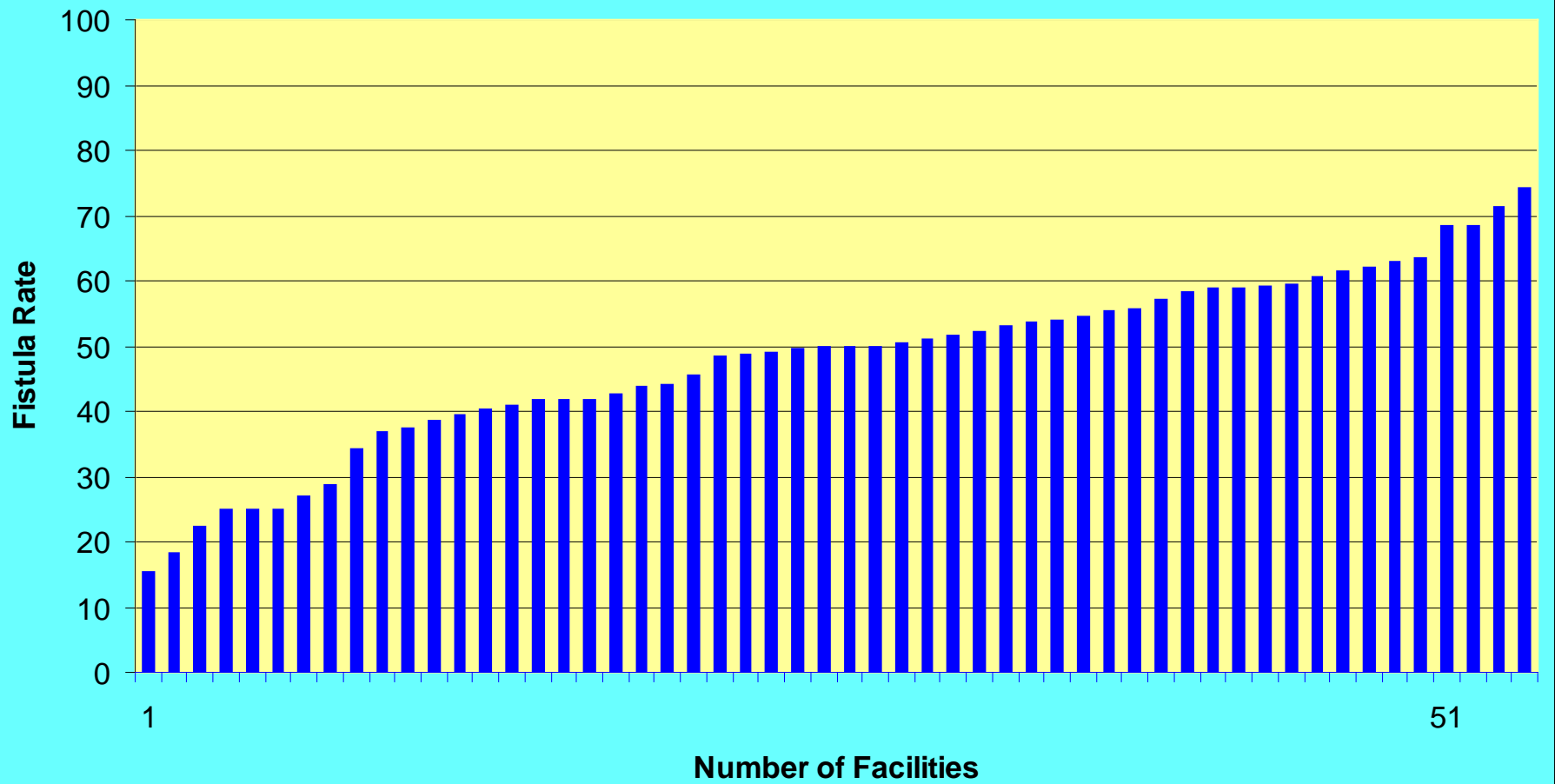
Prevalent AVF Rates – December 2009



Facility Fistula Rate Distribution Dec09



Fistula Rate Distribution of Hospital Based Facs Dec09

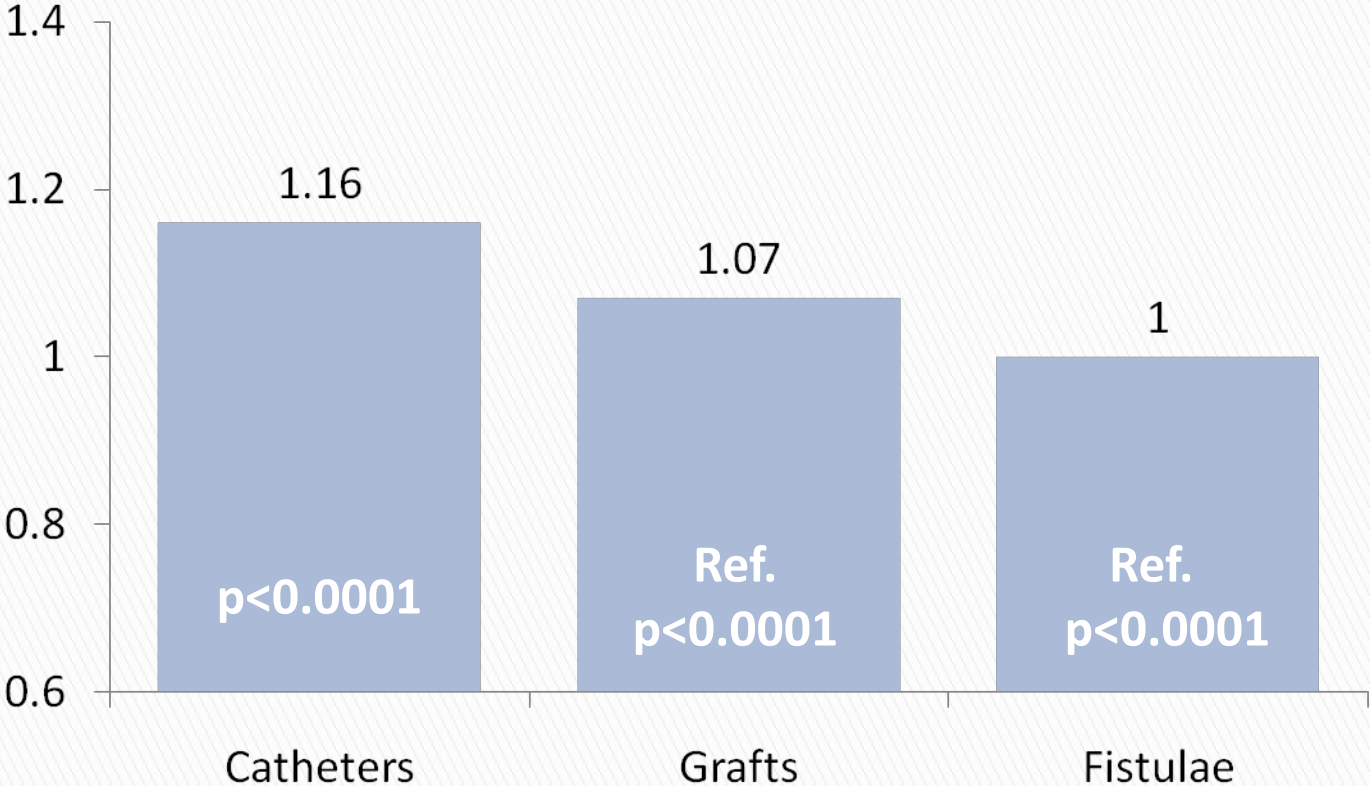


Events by Access Type

Events per 100 pt-mos	Fistulas	Grafts	Cuffed Cath	Non-Cuffed Cath
Admits	9.40	12.90	20.50	32.00
Out Pt abx	2.02	2.39	7.87	7.80
Out Pt Vnco	1.21	1.72	6.48	7.80
Pos Bld Cltrs	.52	.94	5.80	9.95

Vascular Access: Mortality Risk Facility Based Model

**RR of Death among Facility Patients
per 20% more facility use of indicated access type**



*DOPPS I+II, 1996-2004; n=25,709; adjusted for age, gender, black race, yrs with ESRD, 14 comorbidity classes, baseline Hgb, Kt/V, serum albumin, calcium, PO_4 , accounted for facility clustering effects; stratified by continent [Japan, US, EUR (Fr,Ge,It,Sp,UK)]; RR based upon access in use at study entry.

Fistula First Hospital Systems Change Concept Recommendations

- Become familiar with and help implement Fistula First Change Concepts
- Implement protocols that prompt referral to nephrology for patients who present with complicated CKD Stage 3 and all Stage 4
- Implement protocols that prompt referral and vascular access surgery for patients who present with advanced CKD Stage 4 and do not have an AV fistula

Fistula First Hospital Systems Change Concept Recommendations

- ▶ Work collaboratively with nephrologists, surgeons, and interventionalists to implement a triage process that directs patients, who present to the emergency room without appropriate vascular access, to the professionals that will initiate AV fistula placement or make a non-mature AV fistula usable

Fistula First Hospital Systems Change Concept Recommendations

- Develop pathways to schedule vessel mapping, AV fistula surgery, and fistulography for patients without mature AV fistulas with the ultimate goal of establishing a useable native AV fistula in all ESRD patients within 6 weeks of discharge from the hospital
- Provide patient education on modality choice and vascular access selection with an emphasis on AV fistula selection for those patients choosing hemodialysis

Fistula First Hospital Systems Change Concept Recommendations

- ▶ Provide resource linkage and referrals for transportation, vascular center options, etc.
- ▶ Become familiar with vessel preservation concepts which include:
 - Avoiding the use of the subclavian vein in patients with impaired renal function
 - Avoiding PICC lines or veinipunctures in the antecubital vein or cephalic vein of the arms in patients with impaired renal function

Hospital System Change Concept Care Plan



Care of patients at risk for or with chronic kidney disease

Quality Measure	Recommendations/Resources and Tools	Business Case
<p>Identification – the hospital has a mechanism in place to calculate and report an eGFR on all patients age 18 and older with a serum creatinine.</p>	<p>KDOQI – NKF 1. Definition and Stages of Chronic Kidney Disease: Adverse outcomes of chronic kidney disease (CKD) (defined as either kidney damage or GFR < 60 ml/min/1.73 m²) can often be prevented or delayed through early detection and treatment. http://www.kidney.org/professionals/KDOQI/guidelines_ckd/toc.htm</p> <p>KDOQI – NKF 4. Estimation of GFR CKD Stage 1 – GFR ≥ 90 ml/min/1.73 m² CKD Stage 2 – GFR 60 – 89 ml/min/1.73 m² CKD Stage 3 – GFR 30 – 59 ml/min/1.73 m² CKD Stage 4 – GFR 15 – 29 ml/min/1.73 m² CKD Stage 5 – GFR < 15 ml/min/1.73 m² (or dialysis)</p> <p>Tools: Midwest CKD Coalition Position Paper on GFR Reporting</p>	<p>Potential to reduce need for frequent ER visits or inpatient admissions for kidney related complications.</p>
<p>Identification – the hospital has an alert flag for a patient with a laboratory value eGFR 45 – 59 (Stage 3 CKD).</p> <p>Patients with Stage 3 CKD are at risk for progression to kidney failure (Stage 4 or Stage 5 CKD). It is important to pay attention in order to prevent further avoidable damage to the kidneys during hospital stay.</p>	<p>Trigger (eGFR 45 - 59) is used to alert staff to implement Kidney Care Protocols which include:</p> <ol style="list-style-type: none"> 1. Patient education - basic information related to chronic kidney disease. 2. Pharmacy review/alert – current and proposed medications. 3. Radiology/Pharmacy alerts – nephro-toxic agents and IV contrast. 4. Dietary consult – basic renal diet information. 5. Discharge plan to include summary of pertinent information including serum creatinine and eGFR results to be communicated back to the Primary Care Physician via a copy of the Discharge Summary. 6. Discharge plan to include appointment (or at least a recommendation for appointment) with Nephrology as outpatient for patients with complicated Stage 3 CKD¹. <p>Tools: GFR calculator Discharge Communication Sheet</p>	<p>Communication back to the Primary Care Physician can ensure timely follow-up of abnormal lab value and confirmation of chronic kidney disease.</p> <p>Early referral to Nephrology can result in enhanced coordination of kidney care management and kidney disease complications co-management.</p> <p>Effective kidney care management can prevent the need for frequent ER visits or inpatient admissions.</p>

¹ Complicated Stage 3 CKD patients include patients with poorly controlled hypertension, heavy proteinuria, young age at onset of CKD, rapid progression of renal failure and autoimmune disease.

Hospital System Change Concept Care Plan



Care of patients at risk for or with chronic kidney disease

<p>Treatment – an eGFR 30 – 45 (Stage 3 CKD) triggers a plan of action (Kidney Care Protocol).</p> <p>Patients with Stage 3 or Stage 4 CKD are at risk for progression to kidney failure (ESRD or Stage 5). It is important to pay attention in order to prevent further avoidable damage to the kidneys during hospital stay.</p>	<p>Trigger (eGFR 30 – 45) will alert staff to implement Kidney Care Protocols which include all aspects listed above plus:</p> <ol style="list-style-type: none"> 1. Discussion with patient about current knowledge levels and education related to renal replacement options. (Acute care dialysis team may be able to provide patient education resources) 2. Vessel preservation - limiting use of veins to below the wrists until vessel mapping can be arranged. Use of below wrist veins if there is a critical need for IV infusions (ex: in ER, middle of night with no surgical services). Consider alternative central venous catheter options such as tunneled IJ if there is need for long-term IV medication. 3. Vessel preservation – review of PICC line protocols – tie to nephrology consult prior to placement – reduce or eliminate use. Maintaining vessel integrity is essential to provide a future dialysis permanent access placement site. PICC Team should assess renal function as well as any prior history of venous access device sites. Consider Alert language on PICC Line Order Sheet such as: "All patients with abnormal BUN or creatinine require nephrology clearance for PICC Line placement". 4. Nephrology consult during inpatient stay. 5. Vessel mapping during inpatient stay. Vessel mapping can identify the most appropriate extremity for vessel preservation. 6. Discharge plan for outpatient vessel mapping if unable to complete while inpatient. 7. Discharge plan to include follow-up appointment with Nephrology. 8. Discharge plan to include recommendation for Access Surgeon consult. 9. Discharge plan to include social service assessment and recommendations for resources to address additional needs such as financial resources, transportation, and education. <p>Tools: What Hospital Professionals Can Do Recommendations for minimal use of PICC Lines Guidelines for PICC Avoidance Reducing the use of PICC Lines in CKD Algorithm Vein Preservation and Hemodialysis Fistula Protection</p>	<p>Effective kidney care management can prevent need for frequent ER visits or inpatient admissions.</p>
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Hospital System Change Concept Care Plan



Care of patients at risk for or with chronic kidney disease

<p>Treatment – an eGFR 15 – 29 (Stage 4 CKD) triggers a plan of action (Kidney Care Protocol).</p>	<p>Trigger (eGFR 15 – 29) will alert staff to implement Kidney Care Protocols which include all aspects listed above plus:</p> <ol style="list-style-type: none"> 1. Vessel mapping as inpatient. 2. Arrangements for vascular access surgeon consult. 3. Discharge plan to include coordination of appointment for outpatient AV Fistula placement if patient elects hemodialysis as RRT. 4. Discharge plan which includes coordination with Dialysis Center staff to initiate patient/family orientation and education. <p>Tools: Saving Vasculature Reducing Central Line Catheter Infections Diagram</p>	<p>Decreased use of central lines can avoid costs related to infection.</p> <p>Effective kidney care management can prevent need for frequent ER visits or inpatient admissions.</p>
<p>Treatment – for patients already at eGFR less than 15 (Stage 5) and/or on dialysis there is an action plan (Kidney Care Protocol)</p>	<p>Trigger (eGFR < 15) will alert staff to implement Kidney Care Protocol which includes:</p> <ol style="list-style-type: none"> 1. Review of current therapy and access site. 2. Discussion of AV fistula if not already in place for those on hemodialysis. 3. Vessel mapping. 4. Arrangements for vascular access surgeon consult. 5. Discussion of possibility for AV fistula placement during stay. 6. Discharge plan to include coordination of appointment for outpatient vessel mapping and AV fistula placement if not done during inpatient stay. <p>Tools: Temporary Catheter Alert Vein Preservation and Hemodialysis Fistula Protection Reducing Central Venous Catheter Infections Diagram</p>	<p>Conversion to permanent dialysis access will decrease risk of infection and need for frequent ER visits or inpatient admissions.</p>

This material was prepared by the Mid-Atlantic Renal Coalition as part of the Fistula First Breakthrough Initiative Special Project, which is performed under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy.

Hospital Case Study – Root Cause Analysis

1. High proportion of incident dialysis patients without prior nephrology care
 - a. Inner-city population with socio-economic barriers to health care
 - b. Patients with unresolved acute renal failure who initiate dialysis while an inpatient

Hospital Case Study – Root Cause Analysis

2. Lack of consistent protocol for vascular access referral for stage 4 CKD patients followed by nephrologists
 - a. Some nephrologists more unwilling to delegate access referral to nurses
 - b. No consensus among nephrologists regarding triggers for referral
 - c. No vascular access coordinator to monitor and reschedule missed appointments for venous mapping, surgical evaluation, surgical procedures, and surgical follow-up

Hospital Case Study – Root Cause Analysis

3. High turnover of hemodialysis patients
 - a. Over 100 incident ESRD patients per year in a facility with around 100 prevalent hemodialysis patients
 - b. Stable patients with AVF are transferred out to free-standing facilities and replaced by incident patients with catheters

Hospital Case Study – Root Cause Analysis

4. Fragmentation of providers of vascular access interventions
 - a. Permanent vascular access is placed by vascular surgeons and transplant surgeons
 - b. Vascular access salvage procedures are performed by interventional radiology, vascular surgery and transplant surgery
 - c. Providers of permanent vascular access not always available to perform salvage procedures when needed on their own patients

Hospital Case Study – Root Cause Analysis

5. Lack of follow-up by surgeons on newly placed fistulae
 - a. Follow-up appointments not made or missed by patients
 - b. Vascular access coordinator more occupied with urgent access issues

Hospital Case Study – Root Cause Analysis

6. Lack of over-all coordination and management of vascular access
 - a. Vascular access coordinator spread thin with other responsibilities
 - b. Lack of adequate operating rooms for urgent vascular access issues
 - c. Lack of coordination between inpatient and outpatient care of incident hemodialysis patients

Actions Taken – Systems Level

- ▶ The Chairman of the Department of Surgery has committed resources for a dedicated vascular access operating room with ultrasound and angiographic capabilities
- ▶ The Chairman of the Department of Surgery has committed resources for the hiring of a full-time vascular access coordinator

Actions Taken – Systems Level

- ▶ A Vascular Access Coordinating Council has been convened and meets monthly to address system issues which pose barriers to fistula placement and maturation
 - Dialysis Program Medical Director
 - Transplant Surgeon
 - Vascular Access Coordinator
 - Hemodialysis Nurse Manager
- Catheter Patients reviewed monthly & action plans created

Actions Taken – Systems Level

- ▶ Algorithm Development
 - Uniform trigger for vascular access referral
 - Patient education
 - Treatment modalities
 - Nutrition counseling
 - Transplant evaluation referral
 - Vascular access referral

Goal: Increase the percentage of incident HD patients with functioning AVFs!

Hospital Case Study: Early Results

1. Although the prevalent AVF rate has remained in the 25–30% range over the past year, the percentage of prevalent HD patients with a maturing AVF has increased significantly to around 25% as well. If these maturing AVFs can be placed earlier due to more consistent pre-dialysis referrals, the rate of prevalent functioning AVF could approach 50%.
2. On the most recent review (February 2010) of prevalent HD patients dialyzing with a catheter, all patients had –
 - either a maturing permanent vascular access or
 - a scheduled surgery date for permanent access placement or
 - a contraindication for permanent access placement (exhausted access sites, active infection, cardiovascular instability or impending transplant).

Florida Hospital Model: A Community Approach

- ▶ QIO engaged hospitals to take ownership for patients admitted with GFR < 30
- ▶ Care Path/Algorithm
 - Automatic referral to a nephrologist
 - Designate APN for counseling and education
 - Venous mapping and AVF placement

In Summary

- ▶ Benefits of care paths/algorithms
 - Provides consistency of process
 - Takes routine tasks away from busy nephrologist
 - Engages midlevel providers and gives them a level of expertise
 - Provides a measure of accountability and timelines

In Summary (2)

- ▶ Algorithm/care paths are well suited for:
 - Identification of stage 4 CKD patients admitted for other medical issues
 - Providing a trigger for nephrology referral
 - Providing a trigger for pre-ESRD education
 - Modality
 - Transplant referral
 - Dietary education
 - Vascular access referral

Why Hospitals are a Key Player in Fistula First

- ▶ Community responsibility
 - 50% of patients with ESRD have no ongoing nephrology care prior to the initiation of dialysis
 - Hospitals are first (maybe only) point of contact with many ESRD patients
- ▶ High rate of incident patients demands good pre-ESRD care