Fistula First: AV Fistula Maturation Project

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Dialysis facilities
Dialysis patients
Nephrologists
Surgeons
CMS
ESRD Networks
State Survey Agencies
QIOs
And many more!
“Fistula First” GOAL

Goal is to maximize autogenous AVF construction & success rate…..

To achieve in the shorter term (2006) the initial K/DOQI minimum benchmark of AVF use in 40% of prevalent patients…..

And in the long-term (2009), a 66% AVF rate in prevalent patients

Additional Goal: Reduce Catheter Use!
Fistula First Goals (AVF Rates)

- CMS goal – 66% by June 30, 2009
- Yearly Network 18 goal – 55.1% by June 30, 2009
- Yearly Network Stretch Goal – 56.0% by June 30, 2009
- August 2008 AVF rates: NW 18 – 53.7%, US – 50.7%
**Tools & Best Practices:**

**Fistula First Change Concepts**

1. Routine CQI Review of vascular access
2. Timely referral to nephrologist
3. Early referral to surgeon for “AVF Only”
4. Surgeon Selection
5. Full range of appropriate surgical approaches
6. Secondary AVFs in AFG patients
7. AVF evaluation/placement in catheter pts
8. Cannulation training
9. Monitoring and maintenance
10. Continuing Education
11. Outcomes feedback
Improvement in Prevalent AVF Rates by ESRD Network

FFBI AVF goal 66% 66%

ESRD Networks
Jan-03
Dec-07

70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%

Percent Fistulas
**FFBI Accomplishments**

- Website Updates Ongoing (fistulafirst.org)
- Calendar of upcoming vascular meetings (including Networks)
- Tab for Patient Education materials (patient and professionals)
- New interventionist videos uploaded
- Country-wide workshop for surgeons
  - More Cannulation DVD reproduction in the works
- FF Provider Resource List and FAQs
- FF Patient Resource List
FFBI Accomplishments (cont).

- Information sheets on Change Concepts #6 & #9 Monitoring and surveillance flowchart (CC#9)
- Secondary AVF Protocols (CC#6)
- Secondary AVF Sleeves Up Exam Checklist
- Access Managers (CC#6)
- Additional Buttonhole slide set (sharp needles)
Arteriovenous Fistulas (AVFs) Are the Gold Standard for Vascular Access

An AVF is the surgical connection of an artery to a vein, usually in the forearm or arm, created in patients requiring maintenance hemodialysis.

AVFs should be considered first for every patient needing hemodialysis. AVFs last longer, need less rework or repairs, and are associated with lower rates of infection, hospitalization, and death.

The National Kidney Foundation/Kidney Disease Outcomes Quality Initiative (NKF/KDOQI) national practice guidelines, updated in July 2006, recommend greater than 65% of hemodialysis patients have a functioning AVF.

AVF Fistula First is a Coalition Working to Increase the Use of AVFs by Individuals who Need Hemodialysis

- AVF Fistula First is a breakthrough initiative to increase AVF use for all suitable hemodialysis patients.
- We are working together to meet KDOQI guidelines and the CMS stretch goal of increasing the percentage of hemodialysis patients using AVFs to 65% by 2009 nationwide.

AVF Cannulation DVD Available!

What's New?

- Interventionalists Education and Resources Outline
- NKF/KDOQI Management of Cephalic Arch Stenosis
- PICC Line Recommendations
- Vascular Preservation Tools
- Vascular Preservation and Hemodialysis Fistula Protection Recommendations
- Payer Pocket Now Available
- AVF Brochure for Patients and Families
- June 20th-2009 All Coalition Webex Presentations and Recording
FFBI Strategies to increase AVF rate and reduce catheter rate:

- Networks should mount an effort to re-educate and provide feedback on Change Package, to all Providers and Clinics that are below the mean, including the laggards…….
- attempt to focus on gaps in education and performance
- Everyone focus on Change Concepts #6 & #7 – and related FF protocols (fistulafirst.org)
Strategies to increase Secondary Fistulae:

- Re-evaluation of all patients for AVF options:
- Conversion of existing AVG to AVF, utilizing outflow vein of graft for AVF where feasible
- OR:
- Exam & Vessel Mapping for alternate options
- Secondary A-V Fistula Options
- K/DOQI guideline 29: Every patient should be evaluated for a secondary fistula after each episode of graft failure
“Sleeves Up” Exam Followed by Fistulogram
Planning for a secondary AVF is critical
TIMING of Conversion AVG to a Secondary AVF

- 1st AVG failure triggers evaluation for conversion to a secondary AVF—and a plan is established.....

- 2nd AVG failure triggers conversion to an AVF using the fistulogram from the AVG study to evaluate the outflow veins
Proactive strategies to increase AVF Rate:

- Early Referral to Nephrologist & Surgeon – (Patient education/ vessel preservation/ no PICC lines if GFR<45)
- Surgical Evaluation (& Placement) of Permanent Access during initial Hospitalization
- Vessel mapping/ Optimal vessel selection to Increase successful (usable) AVFs & Reduce non-maturing (FTM) AVFs (post-op exam @ 4 wks)
- Monitoring & Timely Intervention for late failure / Aggressive Salvage
- Conversion of AVG to secondary AVF (use FFBI protocol)
Reactive strategies to increase AVF rates (All HD patients with Catheters)

- Regardless of prior access, nephrologists and surgeons evaluate all catheter patients as soon as possible for AVF
- Protocol for Catheter Indications & Removal - Early recognition & intervention for non-maturing AVFs (post-op exam @ 4 wks) — use FFBI protocol
- Monitoring & Timely Intervention for late failure/ Aggressive salvage
The non-Maturing AVF
AVF Dysfunction/failure to mature (FTM)

- > 30% of new AVFs fail to mature (FTM)
  Can markedly reduce early failure rate and interventions in AVFs by:
  - Early referral & CKD program = improved patient & vessel selection/standardized vessel mapping protocol
  - Early recognition of FTM AVF by evaluation (Monitoring & Surveillance) at 4 wks. & timely intervention = high salvage rate (CC# 9)
“NO FISTULA LEFT BEHIND”

CLINICS NEED TO TRACK NEW AVFs……
and TAKE ACTION (Evaluate, Refer, Intervene) on AVFs that are:

1) not adequately maturing at 4-6 weeks

2) have reached 3 months and still cannot be used for 2-needle dialysis
V626 QAPI Condition Statement

- The dialysis facility must develop, implement, maintain and evaluate an effective, data driven, quality assessment and performance improvement program with participation by the professional members of the interdisciplinary team...

- …The dialysis facility must maintain and demonstrate evidence of its quality improvement and performance improvement program for review by CMS
Condition 494.110:

Quality Assessment and Performance Improvement Project (QAPI)

- Interdisciplinary team (IDT)
- Must report problems to Medical Director and QAPI
- Outcome-focused
- Process continuous & on-going
- Use community accepted standards as targets
- Include patient satisfaction, infection control, medical injuries & medication errors
- Plan/Do/Check/Act: Close the loop!
PDCA /PDSA Style

ACT

PLAN

CHECK

DO

/STUDY
Interdisciplinary Team:

Show Me The Progress
### Performance Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequacy</td>
<td>Kt/V, URR</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Albumin, body weight</td>
</tr>
<tr>
<td>Bone disease</td>
<td>PTH, Ca+, Phos</td>
</tr>
<tr>
<td>Anemia</td>
<td>Hgb, Ferritin</td>
</tr>
<tr>
<td>Vascular access</td>
<td>↑Fistula, ↓catheter rate</td>
</tr>
<tr>
<td>Medical errors</td>
<td>↓Frequency of specific errors</td>
</tr>
<tr>
<td>Reuse</td>
<td>↓Adverse outcomes</td>
</tr>
<tr>
<td>Pt satisfaction</td>
<td>↑Survey scores</td>
</tr>
<tr>
<td>Infection control</td>
<td>↓Infections, ↑vaccination status</td>
</tr>
</tbody>
</table>
(V638) The facility must:

- Continuously monitor its performance
- Take actions that result in performance improvement
- Track to assure improvements are sustained over time
Inclusion Criteria for Participating Facilities

- AVF rate < 50% (April SIMS data)
- Highest percentage and number of AV Fistulas placed but not used (source: SIMS vascular access monthly reports)
- Patients census ≥ 50 patients
- Administrative support: All intervention facilities have a stable leadership
Exclusion Criteria

- Patient census < 50 patients
- Facilities already included in another QIWP project with the Network
ENVIRONMENTAL SCAN
RESULTS
AVF Placed vs. Used
(Data: SIMS April 2008)

Number of AVFs

Facilities

A B C D E F G H I J K L M

# AVF Placed 04/08

# AVF Used 04/08
Percentage Of Vascular Accesses
(Total of AVF Maturation Project Facilities - Based on Internal Facility Data)
Top reasons for fistulas not maturing:

- Patient does not exercise arm/lack of patient education on vascular access care
- Need a surgeon with good technique/surgeon performance
- Longer maturation time
- Patient’s age group (older the patient, less chance of AVF maturing)
- Overall patient’s condition (multi-level)/Multiple medical conditions
TOP RESOURCES/EDUCATION REQUESTS (for Patients)

- Better illustrations of vascular accesses – listing CONS only (Spanish)
- Educational material on vascular access types and benefits over a catheter (Spanish)
- Handouts for patients about AVF maturation (Exercise for arm)
- Pre-ESRD classes for patients
- Patient education on vascular access care
Education Materials: Staff

- In-service on access education
- Cannulation in-service for primary cannulators for new AVFs
- Transonic study machine
- Staff education on the maturation process
Education (cont).

- Nephrologists/Surgeons education on vascular access
- Catheter care for SNF staff to prevent infections
- Need good surgeons in the area
- Nephrologists need to partner with good surgeons
Continuum of Vascular Access Care

Assessment

Every day, every shift, every patient

Monitoring and Surveillance

Vascular Access Program

Documentation

Interventions

Look, Listen, Feel

CQI
Static pressure
DVP
Recirculation

Angioplasty
Fistulagram
Thrombectomy
Back to the basics: Physical Assessment of Vascular Access is critical!!!!

- Inspection (look)
- Auscultation (listen)
- Palpation (feel)

Use all of your senses for assessment and then use your memory to compare and contrast the condition of the access to previous assessments.
Inspection

- Inspection: Look
  - General development- AVF
  - Skin condition
  - ?? Aneurysms/ Pseudoaneurysms
  - Skin color of extremities (warm and dry)
  - Any swelling (is there symmetry)
  - Any sign of infection
  - Capillary refill < 2-3 seconds, look for ischemic spots on finger tips
**Inspection**

- Redness
- Drainage
- Abscess

- Hands: cold, painful, numb
- Fingers: discolored

- Skin Color
- Edema
- Small blue Purple veins

- Infection
- Central or Outflow Vein stenosis
- Steal Syndrome
Auscultation

- Auscultation: **Listen**
  - Quality and amplitude of bruit
  - Note pitch changes
  - Systolic and diastolic are louder on the arterial side
  - Pitch changes at areas of stenosis
  - Whistle or cough sound in the access
Palpation

- Palpation: Feel
  - Thrill or pulsation
  - Normally a thrill present at the anatomist's site, and disappears after you manually occlude the AVF
  - If thrill remains = accessory veins
  - The thrill should lessen going to the venous limb of the access
  - Thrill can be felt at the site of stenosis
Palpation (cont).

- Vein Diameter
  - Feel the entire length of the AVF
  - Evaluate for needle site selection
  - Check for flat spots – you can see a stenosis and feel its thrill
  - Evaluate if new AVF is ready to cannulate
Fistula Exam

- Raise the access arm above the heart
  - The fistula should completely collapse
  - Stenosis located at area of engorgement
  - Evaluate arterial inflow
Is New AVF Mature? Use the KDOQI “RULE of 6’s”

Vein MUST Mature PRIOR to the FIRST cannulation

6 cm of straight segment

6 - 8 week Post Op Check AVF Maturation

Depth below skin
Approximately 6 mm

“Rule of 6’s”

Access Blood Flow
Greater than 600 mL/Min

Diameter
Greater than 6 mm
Is the Access Working Properly?

- Clearances (URR) greater than 65
- Access flow greater than 600
- Venous pressure at 200 BRF less than 125
- Able to run prescription
- Other signs and symptoms of access pathology
  - Recirculation
  - Difficulty cannulating and pain in the access
  - Changes in thrill and bruit
  - Prolonged bleeding post-dialysis
Aims to Action: Conducting QAPI utilizing Rapid-Cycle Improvement
What is Rapid Cycle Improvement?

Variant of process improvement that:
- relies on existing knowledge
- dramatically shortens discovery process
- works on “rapid trial & learn” method
- relies heavily on action
Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in an improvement?
Root-Cause ANALYSIS
(Fishbone Diagram)

- Determine the problem and create a problem statement (effect). Write it at the right center of the chart.
- Brainstorm the major categories of causes of the problem. Write them as the main branches steaming from the center line.
- Brainstorm all possible causes of the problem. Ask “Why did this happen?” about each cause.
Root-Cause ANALYSIS (Fishbone Diagram – cont).

- Write sub-causes stemming from the category of causes
- Collect data to confirm root-cause
- If no further causes can be identified, then you found the root causes of the problem
**Plan-Do-Study-Act**

- **Plan** – Identify Opportunity and plan for change
- **Do** – Implement the Change on a small scale
- **Study** – Use data to analyze for the change and determine whether it made a difference
- **Act** – If the change was successful, implement the plan and continuously monitor results. If the change did not work – start the process again.
**Model for Improvement**

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in an improvement?
Developing Your Aim

- Write a clear statement of aim--make the target for improvement unambiguous
  - Include numeric goals
  - Set “stretch” aims
  - Focus on issues that are important to your organization - choose appropriate goals
Improvement relies on *intention* to improve
- Senior leaders set & align aim with strategic goals (involve Medical Director!)
- Agreement on aim is critical
- Include a specific time frame for accomplishing your aim
Examples of Aims

- 70% of all dialysis patients with AVFs created after April 2008 will be functional by January 2009
- To increase the number of patients utilizing AVF as a primary vascular access for hemodialysis by 6 percentage points between October 2008 and May 2009
Project Goal:

- To decrease the number of AVFs “placed but not used” by 20% between October 2008 and May 2009 within the group of participating facilities (N=13)

- Based on the responses from 13 facilities the total number of AVF’s “placed but not used” was 215.

- Need to identify target patients with AVFs created after April 2008 to establish a baseline
Target Patients:

- Every facility should identify target patients with fistulas created after April 2008.
- AVFs created before April 2008 should not be considered as “awaiting maturation” and these patients should have a new vascular access plan created.
Three Ingredients of an Effective Team

- System Leadership
- Technical Expertise
- Day-to-day Leadership
Establishing Your Team

- Have day-to-day, system, and technical expertise
  - Day-to-day leader gives at least 20% (loses sleep)
  - System leader can arrange for the resources to do the work
  - Technical experts know the subject matter--often bedside people

- Use interdisciplinary team (IDT)
Interdisciplinary Team:

Show Me The Progress
Using Data for Improvement
NEW CUYAMA

Population  562
Ft. above sea level  2150
Established  1951
TOTAL  4663
Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in an improvement?

Act  Plan

Do  Study

Measure
Measurement Guidelines

- The key measures should clarify the aim and make it tangible
- Use outcome and process measures
- Integrate measurement into the daily routine
- Use qualitative as well as quantitative data
- Seek usefulness, not perfection
Measures:

- **Process:**
  - Identify patients with AVFs that were placed after April 2008 but not used yet.
  - Vascular access assessment
  - Cannulation Log
  - P-t referral logs
  - Monitor newly created AVF for maturation

- **Outcome:**
  - Decrease in number of AVF “placed but not used”
  - Increase in number of functional AVFs
Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in an improvement?

Select Changes

Act

Plan

Study

Do
Selecting Changes

- **Blatantly steal**: Use the literature, the experience of others, hunches and theories (FFBI suggestions)
- Be strategic: Set priorities based on the aim, known problems, and feasibility
Objective of the Test: Change or No Change?

Probably Change
Test
Redesign
Eliminate
Reduce
Deliver
Implement

Probably No Change
Recruit
Distribute
Continue
Examine
Discuss
Teach
Selecting Changes

- Test the changes on a small scale
  - “By next Tuesday”
  - Capitalize on curiosity
  - Have a bias for the “doable”

- Use change concepts
  - Simplify
  - Error-proof
  - Minimize the hand-offs
To Be Considered a Real Test

- Test was planned, including a plan for collecting data.
- Plan was attempted and data was collected.
- Time was set aside to analyze data and study the results.
- Action was taken, based on what was learned.
Two Key Points

- Small scale $\neq$ small change
- Success (or failure) in one PDSA cycle $\neq$ success or failure of the project
AVF Maturation Project: Network Responsibilities:

- Project Leader (change agent)
- Supply the templates for RCA & PDSA
- Supply toolkits to facilities & evaluate their usefulness
- Provide monthly feedback (Vascular Access SIMS reports)
- Conduct monthly phone interviews to obtain facility-specific data
- Facility site visits for strugglers
Facilities Responsibilities:

- Return agreement letter (signed by MD)
- RCA & PDSA due to the Network by November 14, 2008 (PDSA must be signed by MD)
- Review toolkit and identify tools that would work in your facility
- Follow the project timelines
We are all partners!

*Thank you!*

For questions please contact:
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