Long-term Catheters: Rethinking Candidacy for Surgical Access

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University of Michigan

&

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Sanford Health
Today’s Goals

• Understand the importance of reducing long term catheters (LTC)

• Describe the impact of comorbidities on creating surgical access for patients on dialysis

• Identify common barriers to reducing long-term dialysis catheters

• List best practices for reducing long-term dialysis catheter use
Increased Risk of Adverse Events Associated with LTC

Mechanical Complications Associated with LTC

- Thrombosis
- Fibrin Sheath
- Stenosis
  - Upper extremity deep vein thrombosis
  - Superior Vena Cava Syndrome

- Crack / Hole Catheter
  - Bleeding
  - Air Embolism

\[ \text{Decreased Clearance} \]
Public Reporting and QIP

MICHIGAN DIALYSIS SERVICES OF ANN ARBOR

<table>
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<tr>
<th>Quality of patient care star rating</th>
<th>MICHIGAN DIALYSIS SERVICES OF ANN ARBOR</th>
<th>MICHIGAN AVERAGE</th>
<th>NATIONAL AVERAGE</th>
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<tr>
<td>Adult patients who had a catheter (tube) left in a vein for at least 3 consecutive complete months, for their regular hemodialysis treatments</td>
<td>10%</td>
<td>11%</td>
<td>13%</td>
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*Lower percentages are better*
Arteriovenous Fistula (AVF) Use and Facility-level Comorbidity

• Question: Do facilities with “sicker” patients have lower AVF rates?

• Retrospective cohort study of Medicare patients on dialysis for > 1 year

• 5813 dialysis facilities; 315,919 patients; 12 months spanning 2014-2015

• Predictors: Facility-level burden of patient comorbid conditions; patient characteristics

• Outcomes: facility level use of AVF
Percentage of Patient Comorbidity Across Dialysis Facilities

The diagram illustrates the percentage of patients at different facilities with various comorbidities, categorized by dialysis facility comorbidity percentile groups. The groups are:
- Lowest (<1%)
- Low (1-20%)
- Medium (21-80%)
- High (81-99%)
- Highest (>99%)

Key comorbidities include:
- Diabetes
- Other Heart Diseases
- Cerebral Vascular Disease
- Drug Dependence
- Anemia (non-ESRD)
- Heart Failure
- Peripheral Vascular Disease
- Chronic Obstructive Pulmonary Disease
- Inability to Ambulate
- Infection

The graph shows the percentage of patients at each facility percentile for each comorbidity.
Vascular Access Distribution Across Dialysis Facilities

Dialysis Facility Comorbidity Percentile Groups

- AVF
- AVG
- Long-term Catheter

Percentage of Patients at Facility

Lowest <1%
Low 1-20%
Medium 21-80%
High 81-99%
Highest >99%
Facility Comorbidity Burden and Percentage of Patients using AVF
Take-Home Points: Facility-level Comorbidity

• Small differences in AVF use across facilities until very high or very low comorbidity rates are reached
  — For 70% of dialysis facilities in the United States variation in comorbidity levels accounts for <1% of the difference in fistula rates.

• Facility practice patterns likely account for the variation in AVF use at any given level of comorbidity
# Root Causes: Long-term Catheter Use

<table>
<thead>
<tr>
<th>On path to AVF/AVG, but catheter in &gt; 90 days</th>
<th>Not on path to AVF/AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Too many new catheters in new hemodialysis patients</td>
<td>• Patient declines surgical access</td>
</tr>
<tr>
<td></td>
<td>• Comorbidities prevent creation of access</td>
</tr>
<tr>
<td></td>
<td>• Exhausted all vascular options</td>
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</table>
Don’t Put a Catheter in to Start

- Newer immediate use AVG options
  - Gore Accuseal
  - Atrium Flixene

- Consider for select patients where AVF success may be limited
Urgent Start Peritoneal Dialysis (PD)

• Involves starting therapy < 2 weeks after PD catheter placement as an alternative to urgent HD with a catheter
  • Can be as soon as 48-72 hours after placement
• Low fill volumes (1000-1500 ml) in supine position using cycler
• Requires high degree of organization at program level
Peer Mentoring as a Strategy

- Patient to patient communication
- Words from another patient are sometimes helpful
Surgeon Impact on Vascular Access

- Substantial variation in AVF placement by surgeon.
  - Median placement: 71%

- Greater prior volume of AVF placement assoc. with higher odds of AVF maturation
  - OR: 1.46 (highest v. low)
  - Median Maturation: 59%

Exhausted Vascular Access?

• Consider HeRO device
• Requires coordination between IR / OR
Culture Change Takes a Team

Nephrologist

Radiologist / Surgeon

Dialysis Center Staff

Partnership

Patient and family

Collaboration

Communication
Increasing Fistula Rates Improvement Project

Maria Regnier, RN, MSN, CNN
Sanford Health
SANFORD HEALTH TODAY

Serving 2.74 million people in 300 communities across 252,215 square miles in nine states and four countries.

- 44 medical centers
- $4.4 billion in annual revenue
- 291 clinics
- 48 senior living facilities
- 179,598 Sanford Health Plan Members

1,360 physicians, 921 advance practice providers and 6,348 registered nurses delivering care in more than 80 specialty areas

28,334 employees

17 Hemodialysis Centers
7 Home Dialysis Programs

Each year, Sanford provides:
- 5.3 million outpatient and clinic visits
- 81,637 admissions
- 159,032 surgeries and procedures
- 9,465 births
- 214,236 emergency department visits
### 2015

<table>
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<th>2015</th>
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<tr>
<td>Percent of Patients with AVF</td>
<td>55</td>
<td>65</td>
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<tr>
<td>CMS Facility Goal</td>
<td>65</td>
<td>78</td>
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<tr>
<td>Percent of Patients with Cath &gt;90 days</td>
<td>15.5</td>
<td>14</td>
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<tr>
<td>CMS Facility Goal</td>
<td>&lt;10</td>
<td>&lt;10</td>
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<tr>
<td>Catheter Related BSI per 100 Pt Months</td>
<td>3.078</td>
<td>4.02</td>
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<tr>
<td>CMS Facility Goal</td>
<td>&lt;2.52</td>
<td>&lt;2.52</td>
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</table>
Root Cause Analysis

**Fistula First Fishbone Diagram**

**Caregivers**
- Lacking patient education
  - Poor VA status follow up
  - Lacking P&P for VA evaluation
  - Poor caregiver VA education & training
  - Need Access Coordinator

**Patients**
- Family support
  - Multiple Co morbid
  - No transportation
  - Diminished Cognition
  - Comfortable with catheter
  - Missed Dr. Appointments
  - Refuses VA Surgical procedure

**Fistula First**

**Nephrologists**
- Not engaged
  - No VA follow up
  - Not proactive with CKD patients
  - Lacking VA evaluation i.e., Vein mapping
  - Fistula First burnout
  - Poor surgeon referral

**Surgeons**
- Not Engaged
  - Poor VA placement
  - Not aware of Fistula First
  - Performs grafts over AVF
  - No follow up process in place
  - Not aware of facility expectations
  - Not reimbursed as well as AVG
  - Not a priority compared to cardiac procedures

**Go to Table of Contents**
**Go to Blank Action Plan**
**Meeting Minutes**
**AVF AVG TC Action Plan**
Met with Vascular Surgery Department

What are your expectations regarding dialysis access?
New Workflow

**Week 1:**
Order in therapy plan for referral to surgery for AVF

**Week 1:**
Appointment(s) made of AVF placement

**Week 1:**
Surgery completed

**Weekly:**
Monitor post surgical site and maturation

**Complete by 4 Weeks:**
Surgical Re-check appointment

**Weekly:**
Monitor maturation of AVF

**Complete by Week 10:**
Approval for use (may include appt)

**Week 11:**
Cannulation x3

**Week 12:**
Appointment made for TC removal
Three in One Appointment
# Tool for Dialysis Staff

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>WEEK 1</th>
<th>WEEK 11</th>
<th>WEEK 12</th>
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<tr>
<td>Admit/Insertion Date</td>
<td>1/17/2017</td>
<td>1/24/2017</td>
<td>4/17/2017</td>
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<tr>
<td>AVF placed by</td>
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<td>2/14/2017</td>
<td>3/28/2017</td>
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<tr>
<td>Recheck Appt by</td>
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<tr>
<td>Recheck Appt by Order to use</td>
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<tr>
<td>TC Removed by</td>
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<th>Referral Order in EPIC</th>
<th>Surg Appt Made</th>
<th>AVF Placed</th>
<th>Post Op Appt Made</th>
<th>Recheck Appt</th>
<th>Order received</th>
<th>Cannulate 1</th>
<th>Cannulate 2</th>
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<td># of days TC in place</td>
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<td># of days TC in place</td>
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Other Components

- Weekly wildly importantly goal meeting
- Expert Cannulator Program
- Practice Policy Change: Cannulation of New Fistulas
- Vascular clinic outlier follow up
- Quarterly vascular access meeting over noon hour
Outcome: Catheter Reduction

Percent of Patients With CVC >90 Days

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<thead>
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<th>Year</th>
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<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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<td>7</td>
<td>6</td>
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Outcome: AVF
## Spreading the Practices

### Percent of Patients with AVF

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<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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<td>57%</td>
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<tr>
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**Goal:** >65%

### Percent of Patients with Catheter >90 days

<table>
<thead>
<tr>
<th>Location</th>
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<th>Q2</th>
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**Goal:** <10%
Questions & Discussion