Identifying/Selecting the Right Access for the Right Patient: Beyond the Guidelines

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ABSTRACT

While fistulas are the most successful vascular access in the prevalent HD population not all patients needing HD have the anatomy or physiology for successful fistula creation and use. The literature reflects the populations at risk and suggests alternatives including other kidney replacement therapy (KRT) options such as peritoneal dialysis. However a patient-centered approach to KRT suggests that if HD is the best KRT for the individual then the approach to VA selection should also be patient-centered. This presentation is designed to outline an approach for the assessment of the individual patient’s anatomy and physiology to determine the selection of vascular access with highest potential for HD success.

Revising KDOQI for Vascular Access

• "It shouldn’t be Fistula First or Catheter Last. The best approach, if evidence shows it, should be individualized for placing a patient’s vascular access.” NNI editor Mark Neuman 6/2016 quoting Lok C. NKF 2016

• "KDOQI (2006) and Fistula First (2003) have it all wrong - Vascular Access selection is SIMPLE – you just need to know 2 things about the HD patient’s vasculature – is there INFLOW and is there OUTFLOW? Then you can choose the best conduit.” Author’s interpretation of surgeon, John Ross, 2011.
“Vascular access morbidity and mortality: trends of the last decade”

- CVC ~ 80% of all incident accesses in past decade*
- And steady increase of prevalent AVF to > 50%
- VA morbidity & mortality vary with type of access
- 3-4 fold increase in infection risk with incident CVC vs AVF or AVG
- 7 fold higher for CVC used as prevalent access
- 2-3 fold increase in procedure rates for all accesses
- Significant risk increase in CVC mortality in 1st year

Lok C, Foley R. CJASN 2013
The Challenge of VA Selection

"Attaining the right vascular access in the right patient at the right time in the right circumstances is challenging." Lok C, Foley R. CJASN 2013

"...changes in trends, such as reducing the percentage of patients initiating HD with a catheter, can be made only at the patient level with patient-level information. USRDS cannot inform on some critical variables that may affect change, such as patient preference's, expected patient survival or changes in clinical practice..." Lok C, Foley R. CJASN 2013

Kidney News March 2019

“Harnessing Patients’ Wishes to Drive Vascular Access Innovation”

• "too often, clinicians’ and patients’ vascular access priorities don’t align"
• "what is really important to patients is often trivial to providers"
• "quality of life trumps all"
• "Patients want the ability to travel, dialysis free time, and not being washed out as a higher (priority) than death"

Comments of Terry Litchfield and Dr Roy Chaudry

How to Simplify Physical Assessment for the Best Access for the Individual
CMS Conditions for Coverage 2008

- CMS recognizes the vital importance that vascular access plays on adequacy of dialysis and patient’s overall health status.

- “The interdisciplinary team must provide vascular access monitoring and appropriate, timely referrals to achieve and sustain vascular access. The hemodialysis patient must be evaluated for the appropriate vascular access type, taking into consideration co-morbid conditions, other risk factors, and whether the patient is a potential candidate for arteriovenous fistula placement.”

- “If the patient’s vascular access is NOT an arteriovenous fistula, the record should indicate why the patient was determined to not be a candidate for a fistula.”

GUIDELINE 2. SELECTION AND PLACEMENT OF HEMODIALYSIS ACCESS

- A structured approach to the type and location of longterm HD accesses should help to optimize access survival and minimize complications.

- The access should be placed distally and in the upper extremities whenever possible. Options for fistula placement should be considered first, followed by prosthetic grafts, if fistula placement is not possible. Catheters should be avoided for HD and used only when other options above are not available.
COMPPELLING EVIDENCE
Change In Vascular Access and Mortality in Maintenance Hemodialysis Patients

“Catheters have the worst associated mortality risk. Changing from a catheter to a fistula or graft is associated with significantly improved survival. The risk for grafts approached that of fistulas, providing an alternative to prolonged catheter exposure and potentially less hazardous bridge toward a fistula.”


ACCESS STRATIFICATION TOOL
• An adequate arterio-venous access has three components:
  1. inflow
  2. conduit
  3. outflow
**WHAT IS INFLOW?**
- It starts at the Heart
  - Cardiac output
  - Cardiac ejection fraction
  - Systolic pressure
  - And travels through arteries
  - Size matters
  - Tissue health
- Flow is volume X speed = mLs/min – sufficient to provide adequate blood flow to and through the access plus the ECC*

**WHAT IS A CONDUIT?**
- A natural or artificial channel through which something (as a fluid) is conveyed (Merriam-Webster)
- It is the vessel that carries the blood that is accessed for hemodialysis
  - Arterialized fistula vein
  - Interposed graft

  *Not applicable if there is insufficient inflow!*

**WHAT IS OUTFLOW?**
- It starts at the Heart
  - Right atrial pressure/central venous pressure – is it low enough to adequately receive increased cardiac output?
  - And works backwards through the central veins to the peripheral veins
  - Size matters
  - Tissue health
  - Distensibility
  - Presence of stenosis and/or occlusion
- Flow is still volume X speed = mLs/min
Quality of the Three Components DETERMINES POTENTIAL for Best Access

- Quality in Three Strata:
  - Grade A: good anatomy and physiology
  - Grade B: fair condition of anatomy and fair/or modifiable physiology
  - Grade C: poor anatomy and poor/or nonmodifiable physiology

ROSS/DINWIDDIE ACCESS STRATIFICATION TOOL

- AAA = good inflow, good outflow, and good conduit (veins) – an arteriovenous fistula
- AAB = good inflow, outflow, fair conduit – could be an AVF or an AVG
- ABC = good inflow, fair outflow, poor conduit veins = AVG
- ACC = …………..

Access Algorithm using This 3X3 Tool

- Permutations and combinations that must be assessed for potential access -
  - what about CCC?  CCC = CVC!!!!
ACCESS ALGORITHM USING THIS 3X3 TOOL

ACC – great inflow, poor outflow = ????
ACA
ACB

C grade for central outflow = ?catheter only or leg graft?

All the peripheral vein preservation and vein mapping in the world will not help this patient get a fistula OR a conventional graft!

ACCESS STRATIFICATION MATRIX

ROLE OF THE HERO GRAFT IN VASCULAR ACCESS ALGORITHM

ACC or BCC
VASCULAR ACCESS ALGORITHM
ASSESSMENT IS EASY AS 1,2,3

1 inflow – starts with the heart

2 outflow – starts with the heart

3 conduit can be decided when you know you have both inflow and outflow

TESTING OF THE STRATIFICATION TOOL

- To date just a hypothetical construct as a logical and useful approach to assessment
- Utility for improving catheter reduction efforts
- Utility for CQI in conjunction with active VAT in assuring plan for “next access”

THE TEAM APPROACH
TESTING OF THE STRATIFICATION TOOL

• Choose x # of units that most need improvement assistance ( ? Power)
• Pair for similarity of data, (demographics, size of facility, # of CVCs, etc )
• Randomize to either:
  • Intervention group (trained to use tool)
  • Control (given standard catheter reduction teaching)
• Collect data for ? 6 months ? 12

TRAINING TO USE STRATIFICATION TOOL

• Reviewing pertinent access history as per KDOQI Guideline 1
  • Previous access
  • Previous surgeries (cancers, transplant)/trauma
  • Cardiac history – pacemaker, stents etc
• Teaching physical assessment as it relates to
  • Inflow
  • Outflow
• Create flow diagram using stratification tool

REVISED KDOQI FOR VASCULAR ACCESS

• “It shouldn't be Fistula First, or Catheter Last. The best approach, if evidence shows it, should be individualized for placing a patient’s vascular access.” NNI editor Mark Neuman 6/2016
• “The prior messages were 'Fistula First, Catheter Last, Functioning Fistula First’ - we are not going to necessarily do that. What we want is individualized care with standardized processes,” Lok C. NKF 2016 quoted in NNI, 6/2016
WHAT IS “PATIENT-CENTERED CARE”?

- In its landmark book, Crossing the Quality Chasm (2001, p. 40), the Institute of Medicine (IOM) defined patient-centered care as “…providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions”.

CASE STUDY – GREAT INFLOW, OUTFLOW, MATURING FOREARM AVF – AAA!

- EL – a white female in her mid 70s – CKD due to vasculitis
- Incident to HD with a RIJ CVC
- And a maturing R forearm AVF
- Quiet, vague lady who slept during HD
- Lived with and cared for by daughter
- Rx to cannulate AVF when mature and remove CVC asap

CASE STUDY – GREAT INFLOW, OUTFLOW, MATURING FOREARM AVF – AAA!

- An attempt was made to cannulate with one needle
- The initial cannulation WAS successful - for a matter of minutes!
- Became highly agitated and started screaming to “get it out of there”
- No apparent understanding of the purpose of the needle
- A history of “mild alzheimers”
- Her daughter sedated her for medical appointments including procedures
CASE STUDY – GREAT INFLOW, OUTFLOW, MATURING FOREARM AVF – AAA!

- Daughter concluded from options that she had been given that she "just couldn’t let her Mama die" and she wanted us to keep on using the catheter for now.
- Not long after, EL was transferred to a live-in facility were she received nocturnal PD.
- her case shows that "one size does not fit all or even most"

This was a case of vascular access surgery that should have never happened!!!!

CASE STUDY – GREAT INFLOW, OUTFLOW, MATURING FOREARM AVF – AAA!

- Access Stratification Tool – AAA – scores a perfect 10!
- Patient outcome? Scores a minus zero!
  - A wasted surgery in all respects especially cruel punishment for a mentally incompetent patient
  - Definitely NOT patient centered care!
  - We can and must do better!
  - A tool is still just a tool!

REFERENCES & RESOURCES

- USRDS 2016 – USRDS.org
REFERENCES & RESOURCES