Which AVF is Best?

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Disclosures

- **Research Grants:**
  - Vascular Therapies (ACCESS-2 Trial)
  - Humacyte (V-012 Trial)
  - VenoStent (SAVE-FistulaS Trial)
  - Voyager Biomedical (ACT II Trial)
  - Laminate Technologies (Post Market Study for VasQ)
  - AMPLIFI Medical (AMPLIFI-1 Trial)
  - Venova Medical

- **Consulting:**
  - Humacyte
  - Venova Medical
  - LeMitre



Defining the Best AVF



Earliest Usability?

Shortest time from creation to first cannulation



Best Durability?

Longest functional patency with fewest failures



Lowest Maintenance Burden?

Fewest reinterventions to maintain function



Fewest Complications?

Lowest risk of steal, stenosis, and cardiac morbidity



Most Cost-Effective?

Best outcomes per dollar over the access lifetime

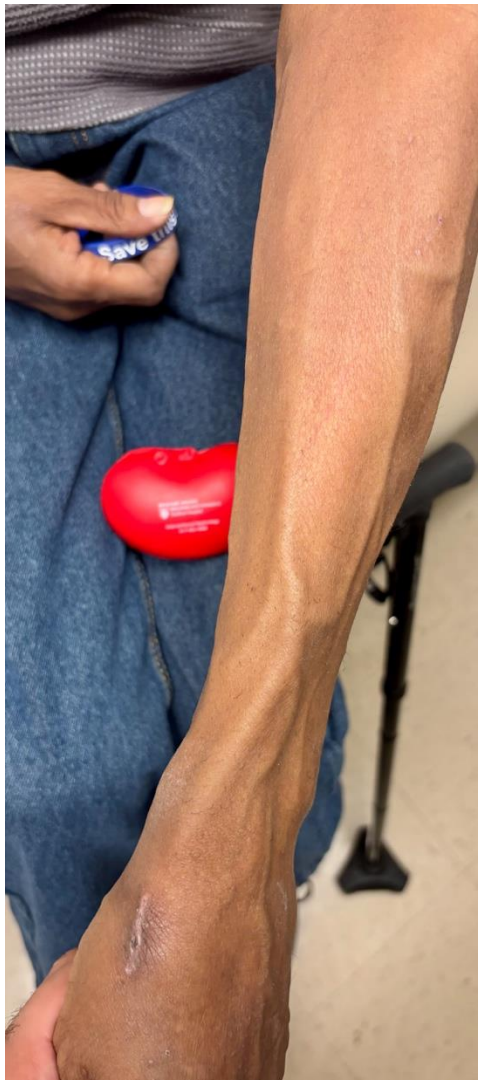
Or is it simply the most distal?

Which AVF is Best?

"Snuffbox, because it is the most distal"

-PGY-3 Surgery Resident on Vascular Rotation at BWH

Is Snuffbox AVF Best?



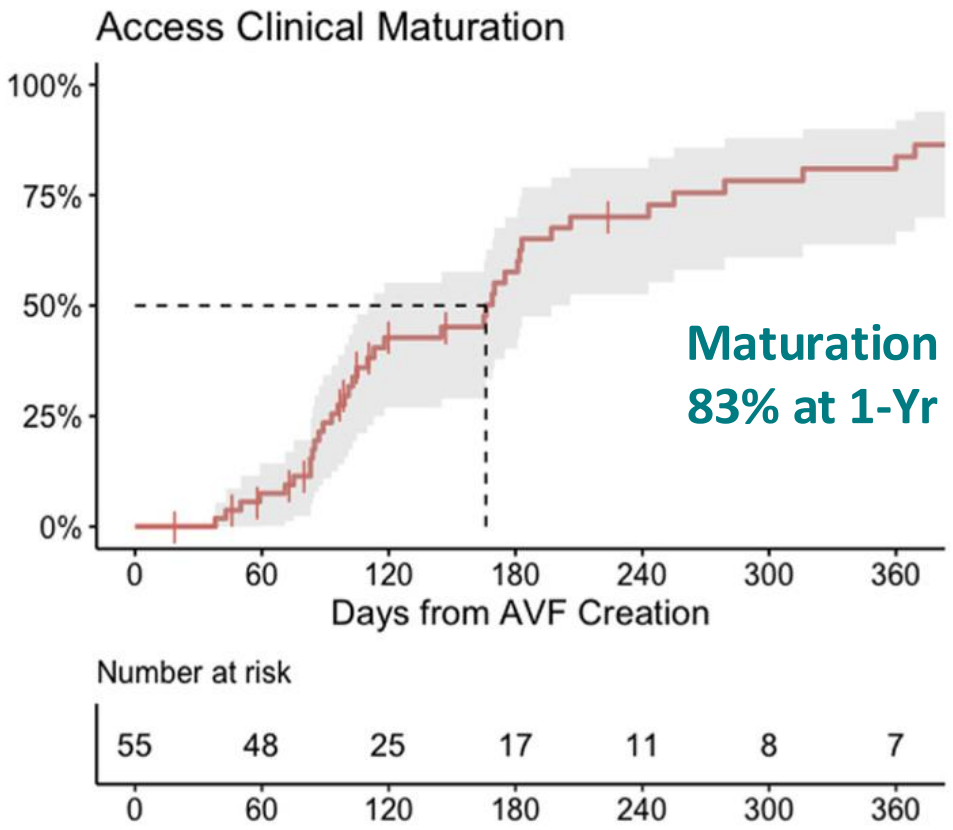
55M pre-ESKD (eGFR 12)

- POD # 10 from L snuffbox AVF creation



Snuffbox AVF Outcomes

N = 55 at BWH (2021)



N = 258 in Qatar (2026)

Primary-Assisted Patency

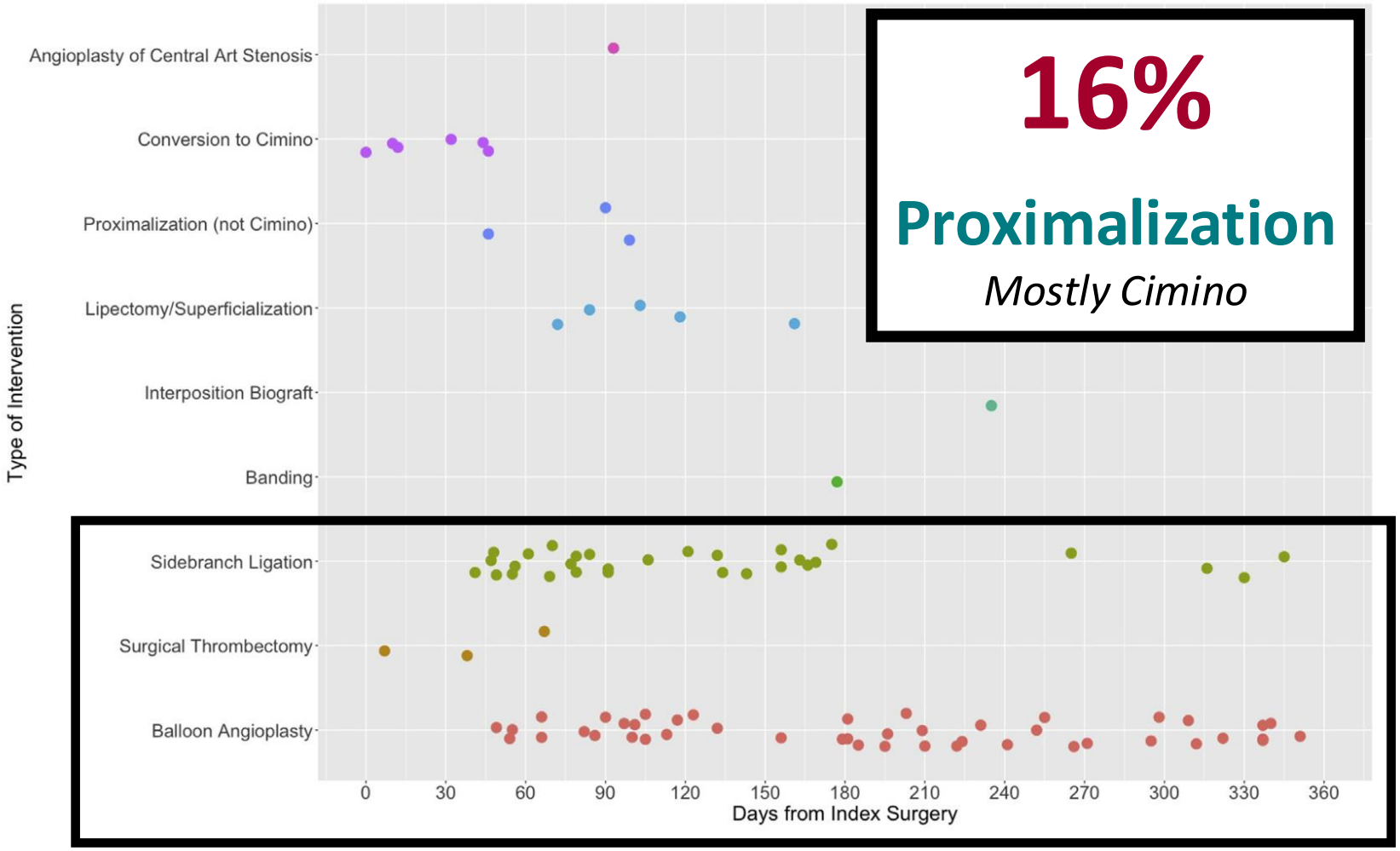
- 1-Yr: 84%
- 3-Yr: 56%

Median Cannulation Time

- 86 days

Heindel P, Ozaki CK, Hentschel DM, et al. J Vasc Surg 2021;74:947-56; Khalaf M & Fares A. J Vasc Surg 2026;83(1):280-88

Snuffbox AVF Reinterventions (Median = 2 in First Year)



16%

Proximalization

Mostly Cimino

78%

Minor Reinterventions

Balloon Angioplasty

Side Branch Ligation

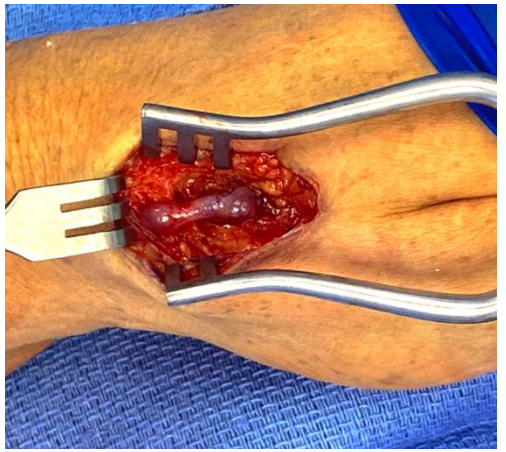
Heindel P, Ozaki CK, Hentschel DM, et al. J Vasc Surg 2021;74:947-56

Snuffbox is Consistent w/ KDOQI Guidance on AVF Creation

- If suitable with ESKD Life-Plan:

  1) **Distal-to-proximal** approach

  2) **Vessel preservation** for future access options



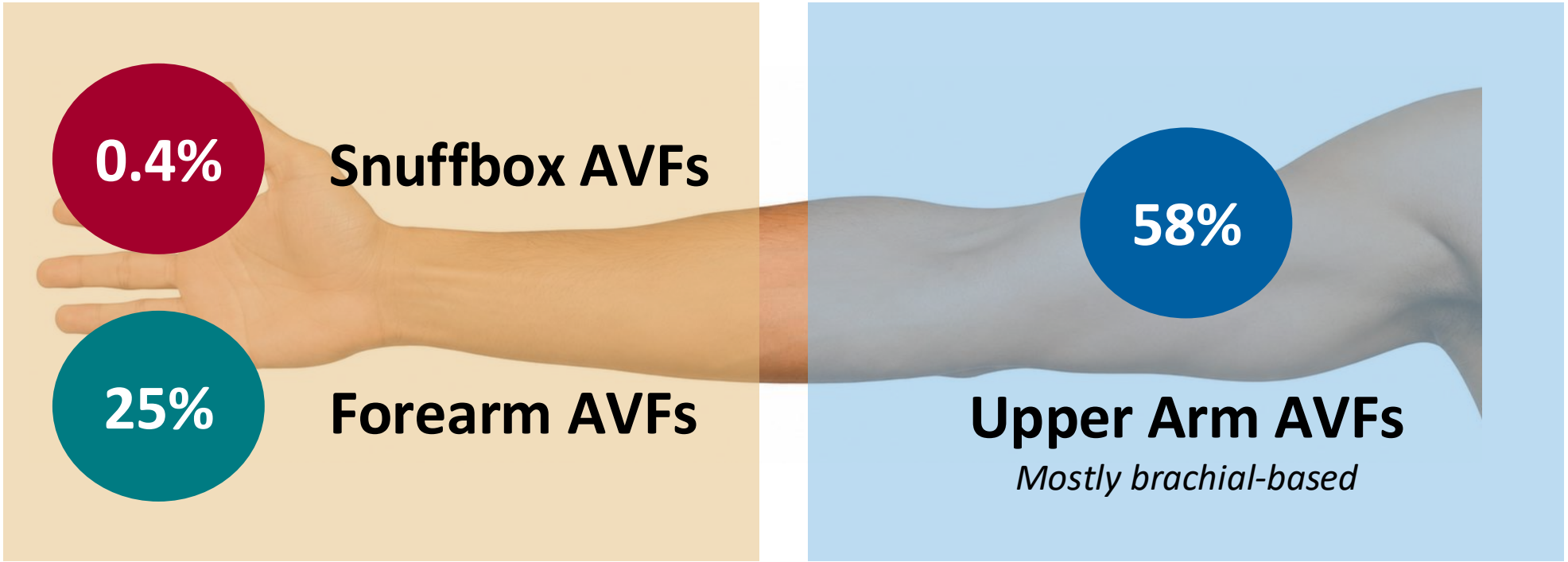
How many patients get a snuffbox?

Lok et al. KDOQI. Am J Kidney Dis. 2020;75(4 Suppl 2):S1-S164



Few Patients Get Distal AVFs in US

N = 52,170 First-Time Surgical Accesses (VQI; 2012-2022)



If snuffbox isn't practical at scale, what about forearm vs upper arm AVFs more broadly?

Forearm vs. Upper Arm AVFs: Similar Performance

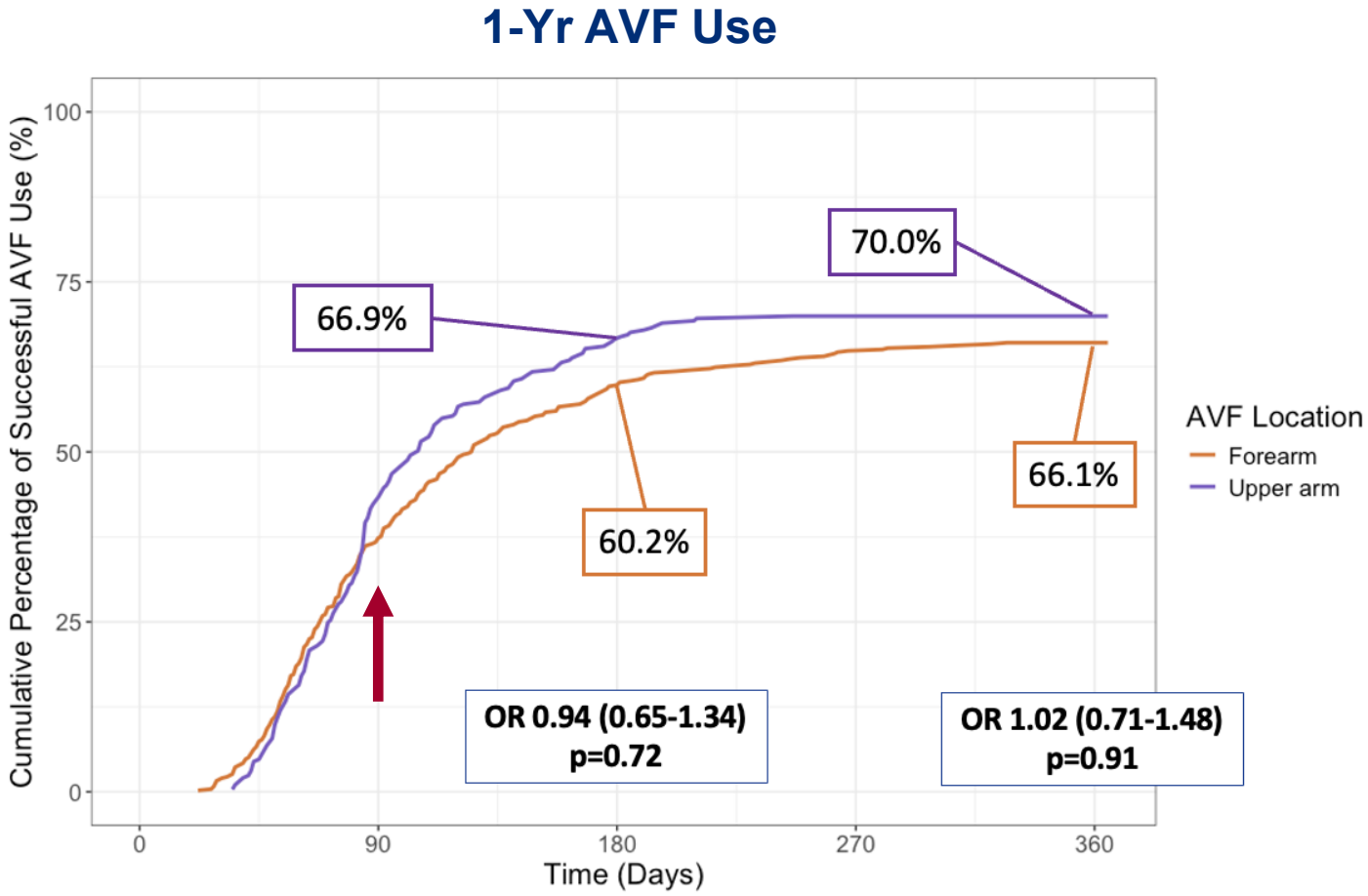
N = 1,516 AVF creations
Prospective Multicenter RCTs

1-Yr AVF Use:

- **66%** Forearm
- **70%** Upper arm

3-Yr Secondary Patency:

- **66%** Forearm
- **67%** Upper arm



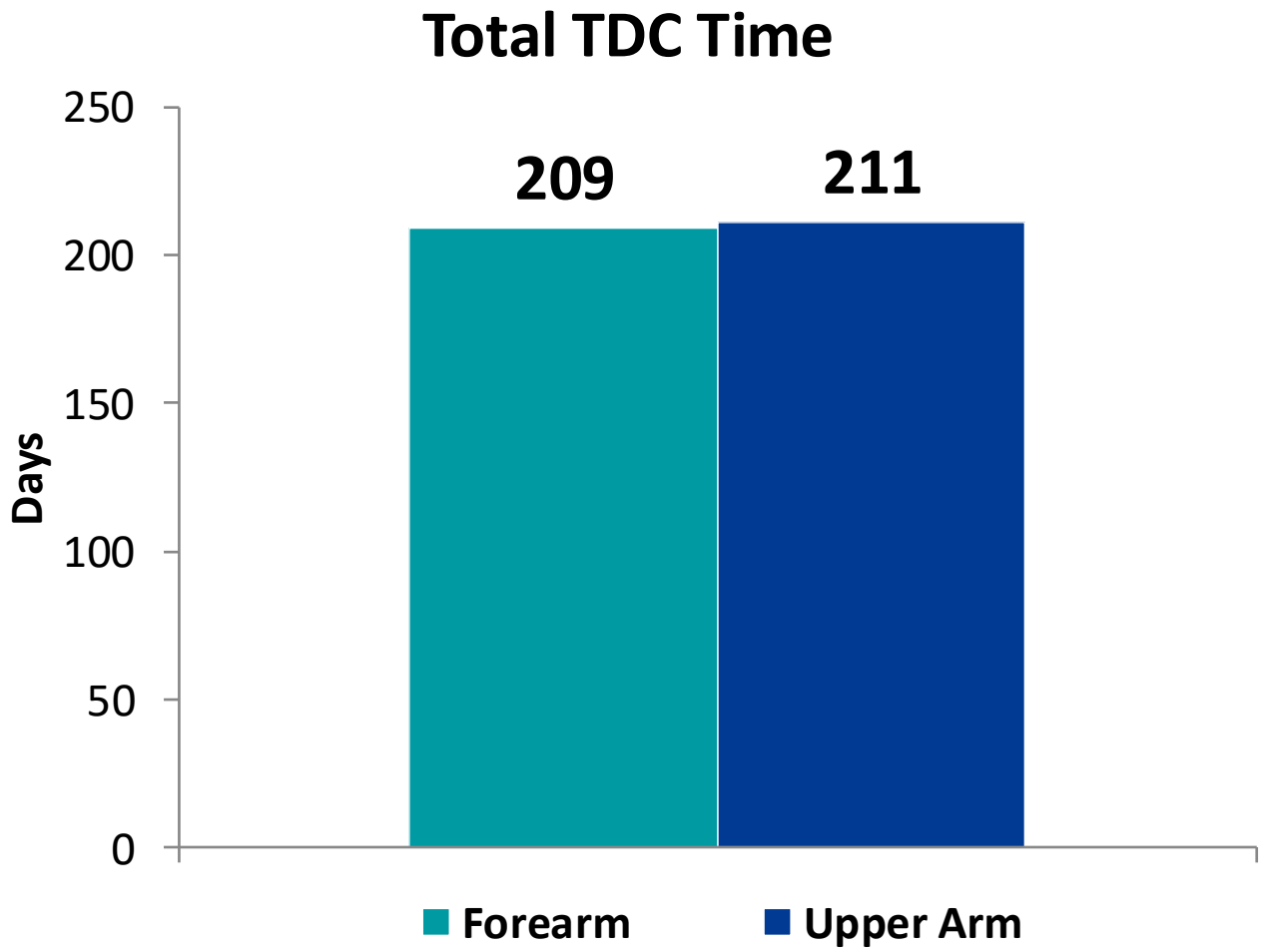
Manchella MK, Hentschel DM, Ozaki CK, Hussain MA, et al. J Vasc Surg. 2025;82(3):1048-57

Forearm vs. Upper Arm AVFs: Same Catheter Time

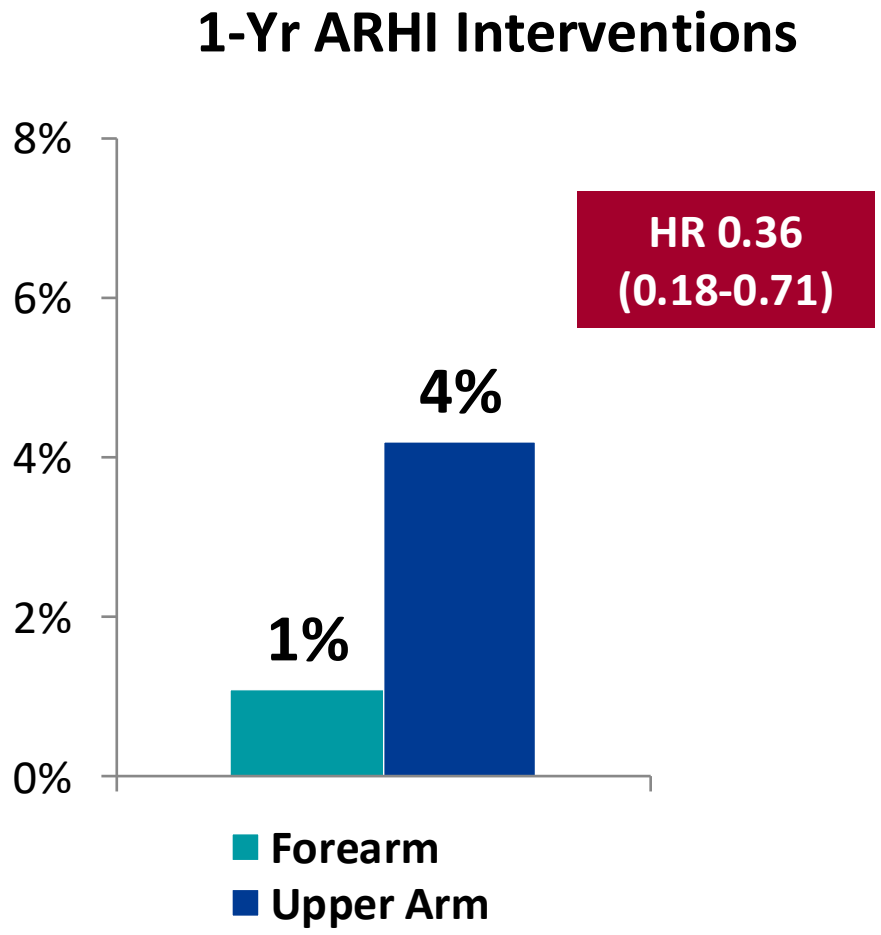
N = 645 AVFs

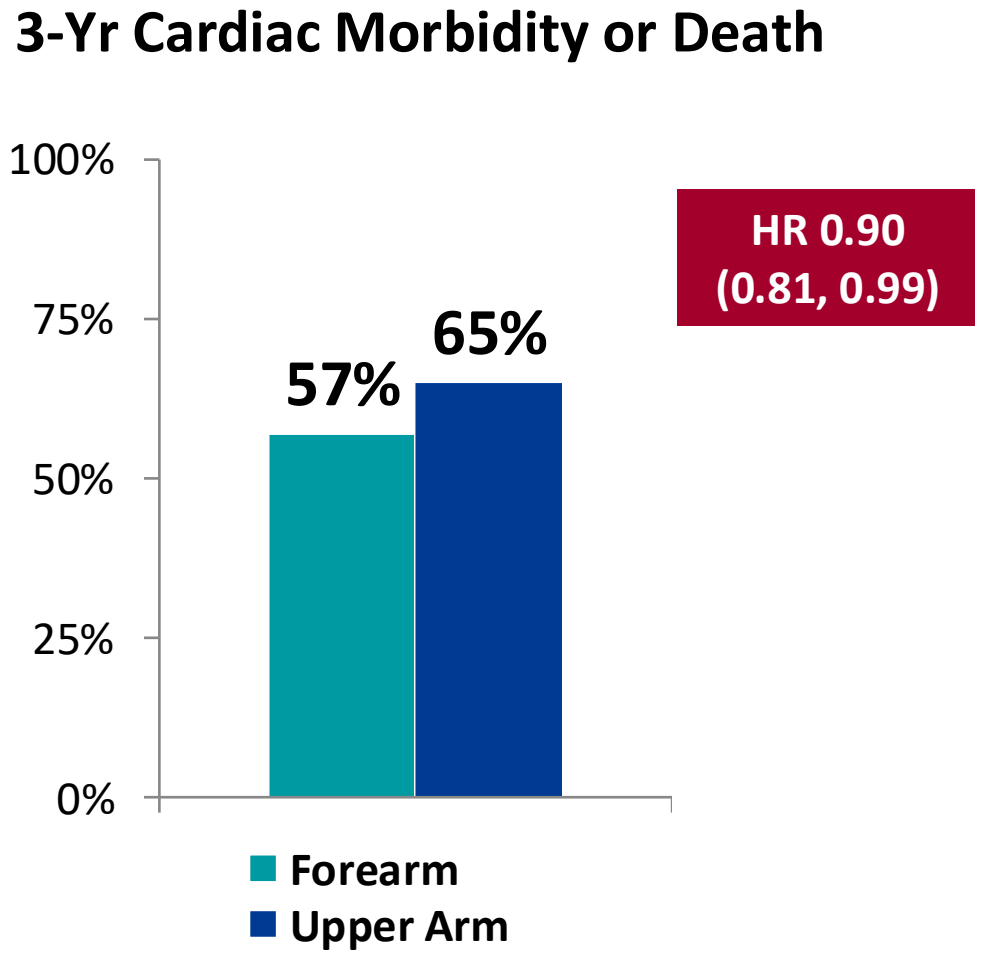
LA County Hospitals

2014-2019



Forearm AVFs: Less High Flow-Related Complications





Manchella MK, Hentschel DM, Hussain MA, et al. J Vasc Surg. 2025;82(3):1048-57; Fitzgibbon JJ, Hussain MA, et al. NESVS 2025.

High Quality Data Suggest…

Forearm AVF = Upper Arm AVF	Forearm AVF > Upper Arm AVF
Usability	Access-Related Hand Ischemia
Durability	Flow-Related Complications
Catheter Time	Cardiac morbidity & mortality

But there is a hidden confounder…

Volume & Expertise Matter for Forearm AVF Success

2-2.5x worse patency

For **forearm AVFs** at **low volume centers (<30/yr)**
P-interaction <.001 for secondary patency

50% lower usability

For **forearm AVFs** at **low volume centers (<30/yr)**
P-interaction = 0.03 for AVF use at 1-yr

***Volume did NOT impact upper arm AVF outcomes**

Inadequate Trainee Exposure to Forearm AVFs

10

3 Forearm AVFs
7 Upper arm AVFs

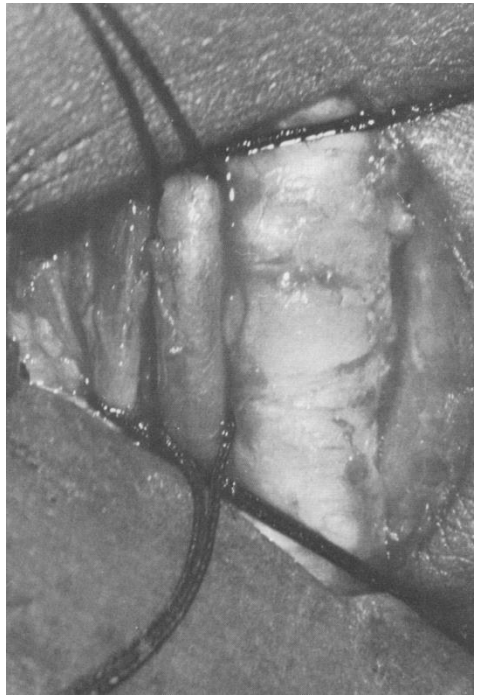
Median AVF Creations

VSx Chief Residents 2025

N = 80

Innovation Is Re-Defining What is the Best AVF

First AVF 1966



AVF Today 2026



1966

- Local anesthesia
- Radial artery & cephalic vein mobilized
- Vessels are clamped
- 5 mm end-to-side anastomosis
- Palpate for a thrill
- Cannulate for dialysis

What has changed over 60 years?

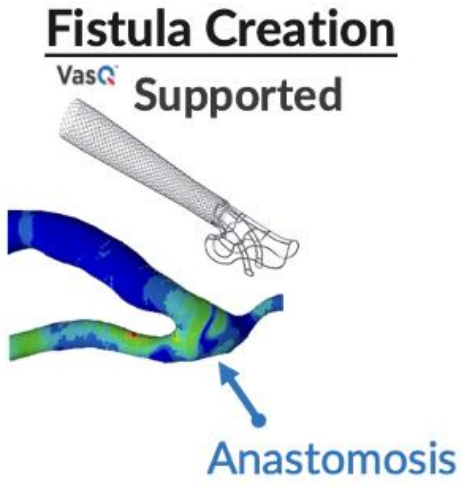
- Photo is in **color**

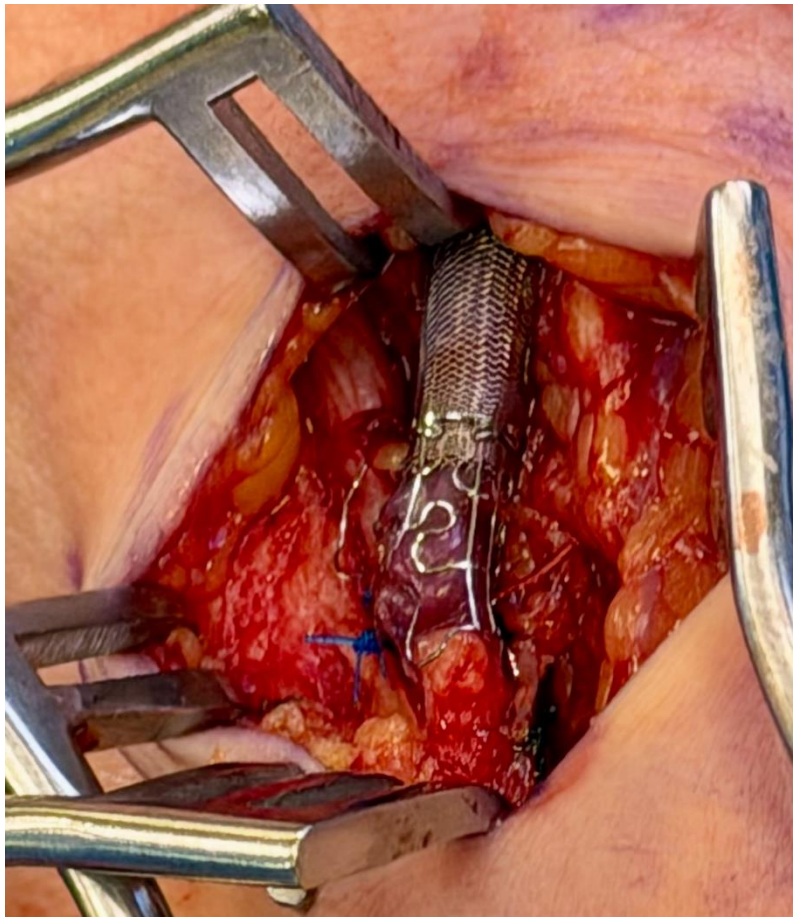
Innovation will change the AVF landscape dramatically

Brescia et al. N Engl J Med. 1966;275(20):1089-9

1 65M Distal Forearm RC-AVF w/ VasQ

- **VasQ** — nitinol scaffold to support AVFs
- Control of AVF configuration & flow regulation
- FDA approved & PMS RCT

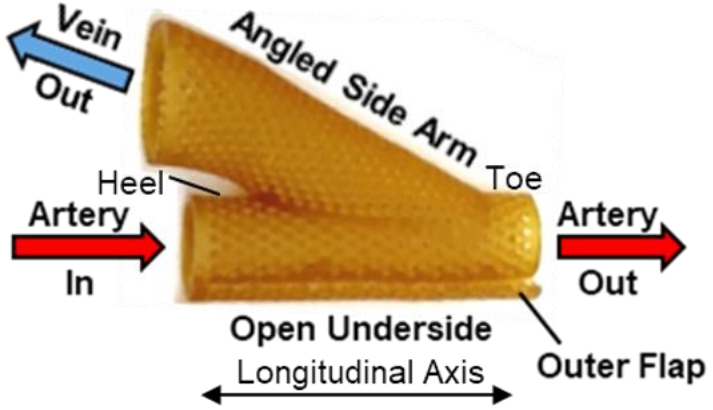




Lucas JF, et al. J Vasc Access. 2026;27(1):244-51

2 75M Proximal Forearm RC-AVF w/ SelfWrap

- **SelfWrap** — bioabsorbable wrap around AVF
- Mechanical support & outward remodeling
- Investigational as part of SAVE-FistulaS Trial



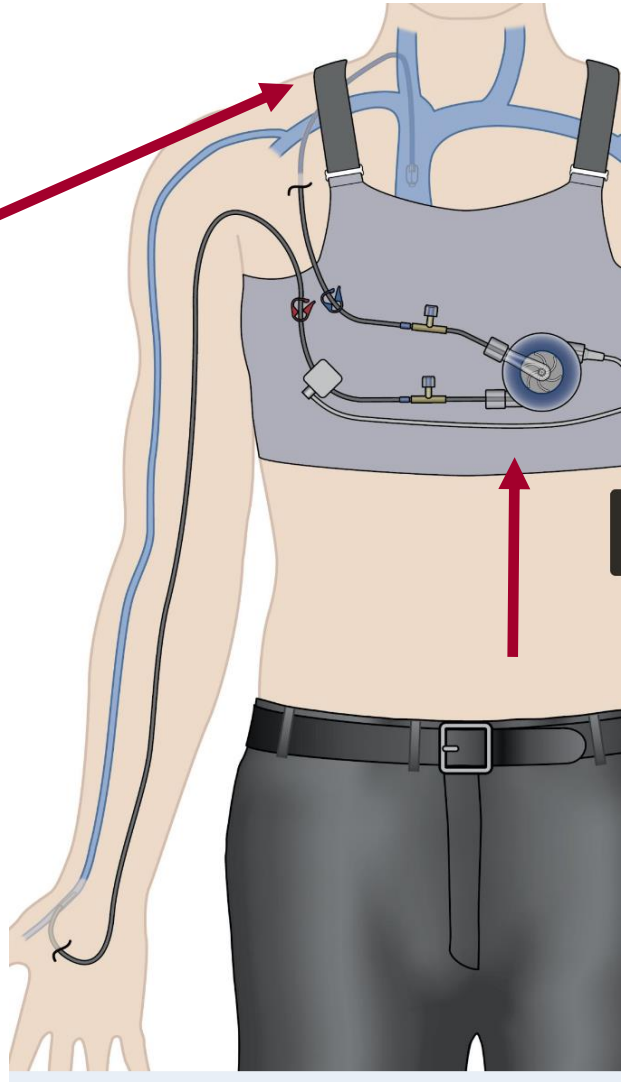


3 58M Wrist RC-AVF Post AMPLIFI Vein Dilatation

- 1.7 mm forearm cephalic vein & no upper arm veins
- **No conventional AVF options**

- **Day 0**
  - Central venous catheter in IJV
  - Peripheral venous catheter in snuffbox cephalic
  - AMPLIFI pump to dilate forearm cephalic vein

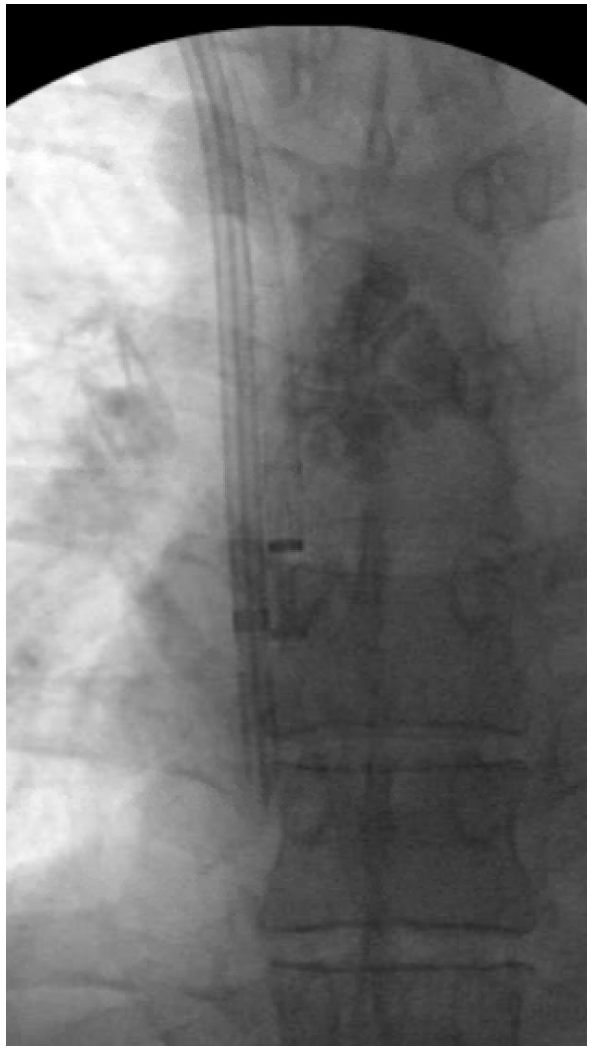
- **Day 3**
  - Creation of wrist RC-AVF



Peripheral AMPLIFI Catheter

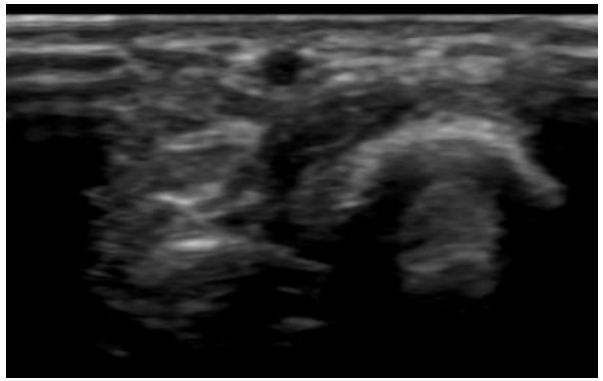


Central AMPLIFI Catheter

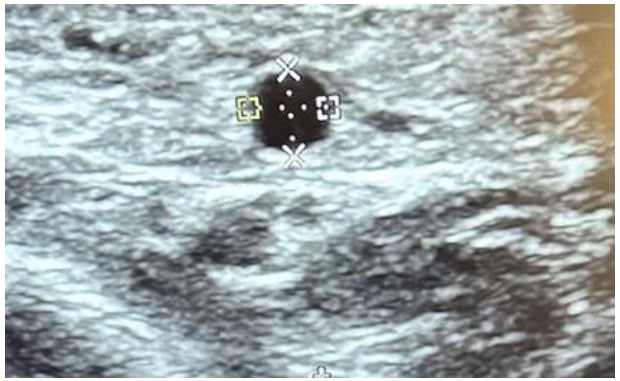


Vein Dilation 2-3x With AMPLIFI

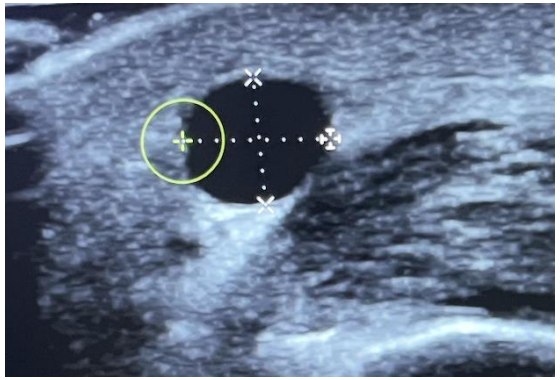
Pre-Op



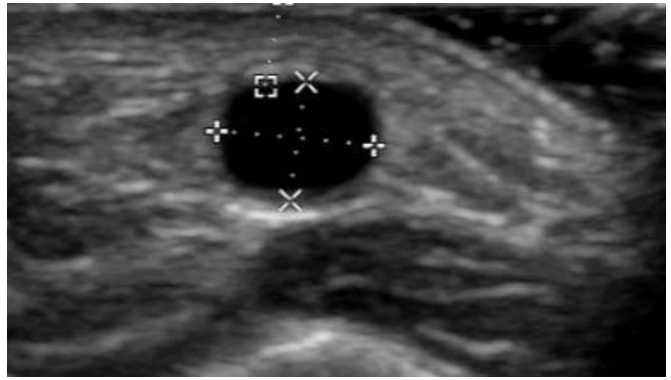
Day 1 AMPLIFI



Day 2 AMPLIFI

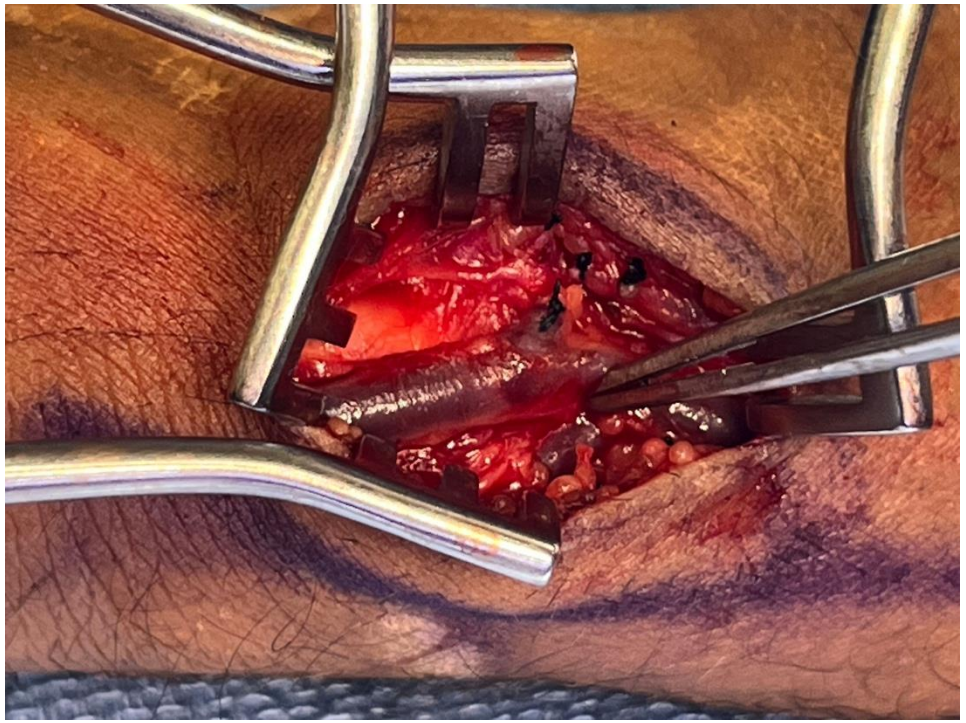


Day 3 AMPLIFI

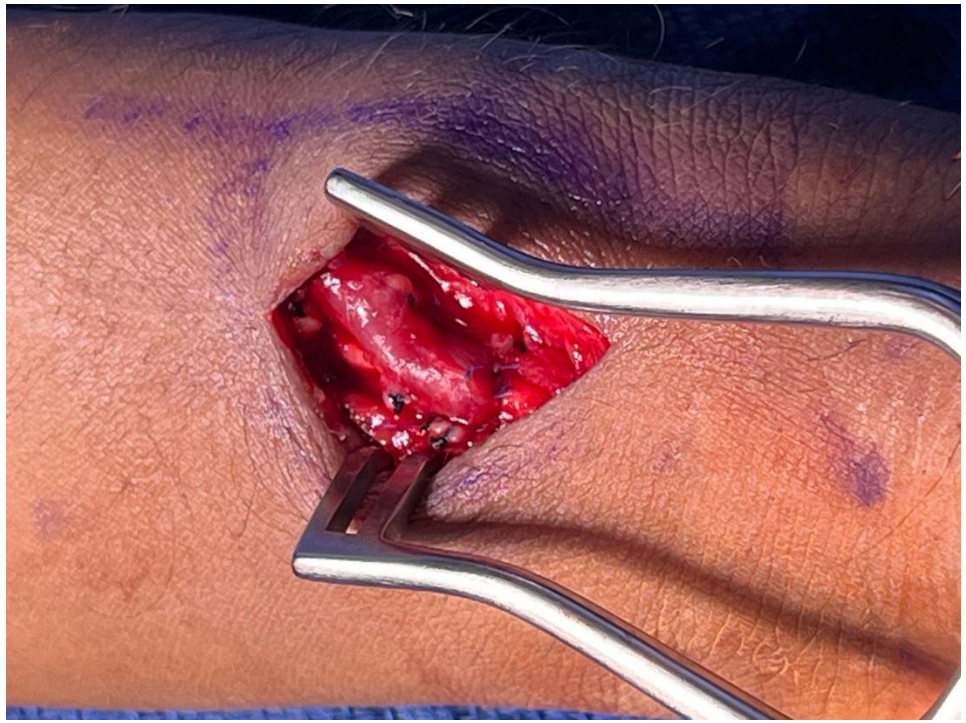


Wrist RC-AVF Creation Post AMPLIFI Treatment

Dilated Vein w/ Active AMPLIFI Treatment



Wrist RC-AVF



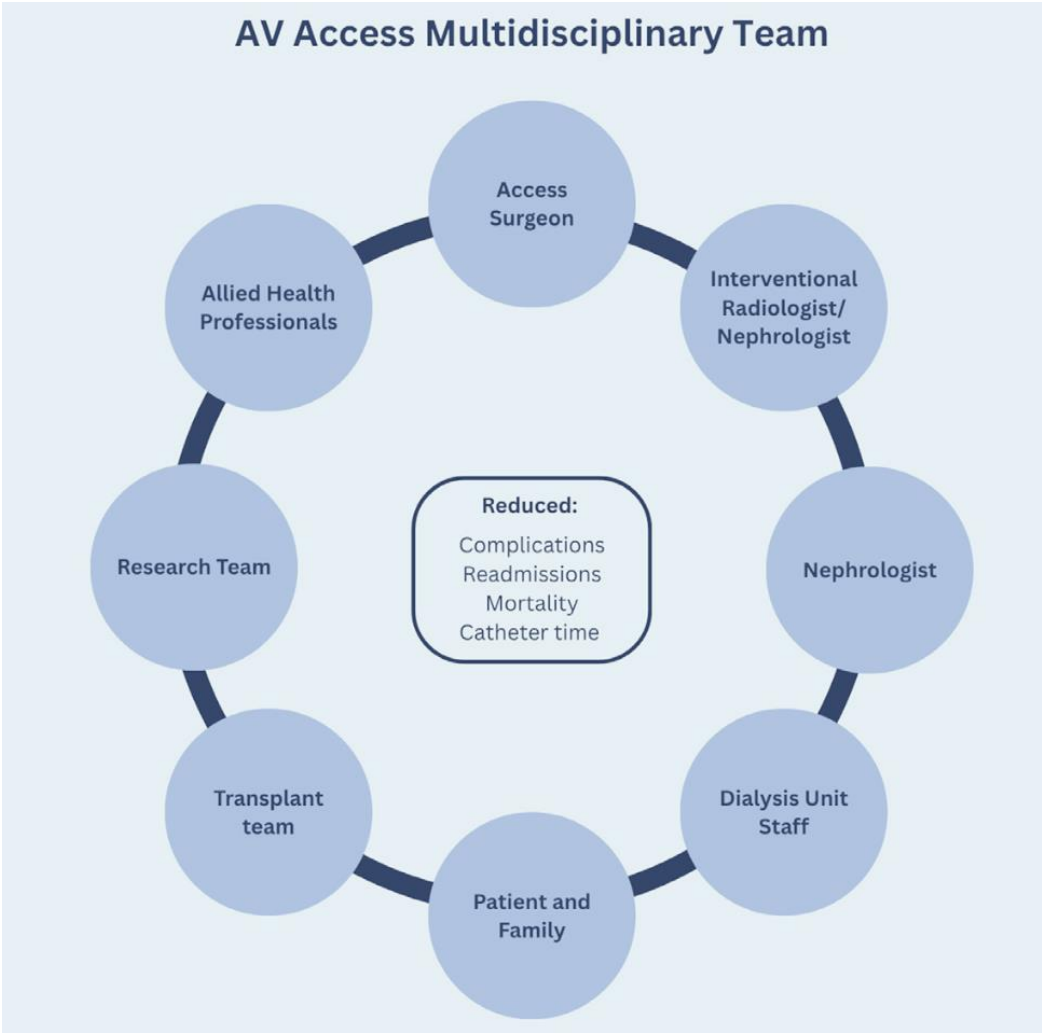
AMPLIFI-1 Trial is Officially Underway in North America!



clinicaltrials.gov: NCT07211035

The Team Makes the Best Fistula





Summary

“The best AVF is…”

As distal as feasible (*generally snuffbox & forearm*)

At a center with adequate volume & expertise

Enhanced by available technology

Supported by a multidisciplinary team

Individualized to the patient’s ESKD life-plan