

Fistula First:

A Seminar for the Nephrology Nurse

*The ABCs of Arterio-Venous
Fistulae*

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Why AV Fistulae?

✓ Nephrology Literature and Scientific Research:

✓ *K-DOQI describe AV Fistulae (AVF) as "preferred" vascular access*

✓ Professional Renal Associations re:AVF:

✓ ANNA Position Paper:

❖ *Optimally all HD patients should have a functioning access prior to initiating HD*

❖ *..native AVF is still the "Gold Standard"*

Why?

★ AV Fistula:

★ Fistula is "Gold Standard" for Access

★ Longest lasting Access

(75% working @ 3 years)

★ Least likely to be infected

(35 x less than CVC)

★ Lowest Mortality

(3 x less than CVC) (K.I. 02)

The ABCs of AV Fistulae

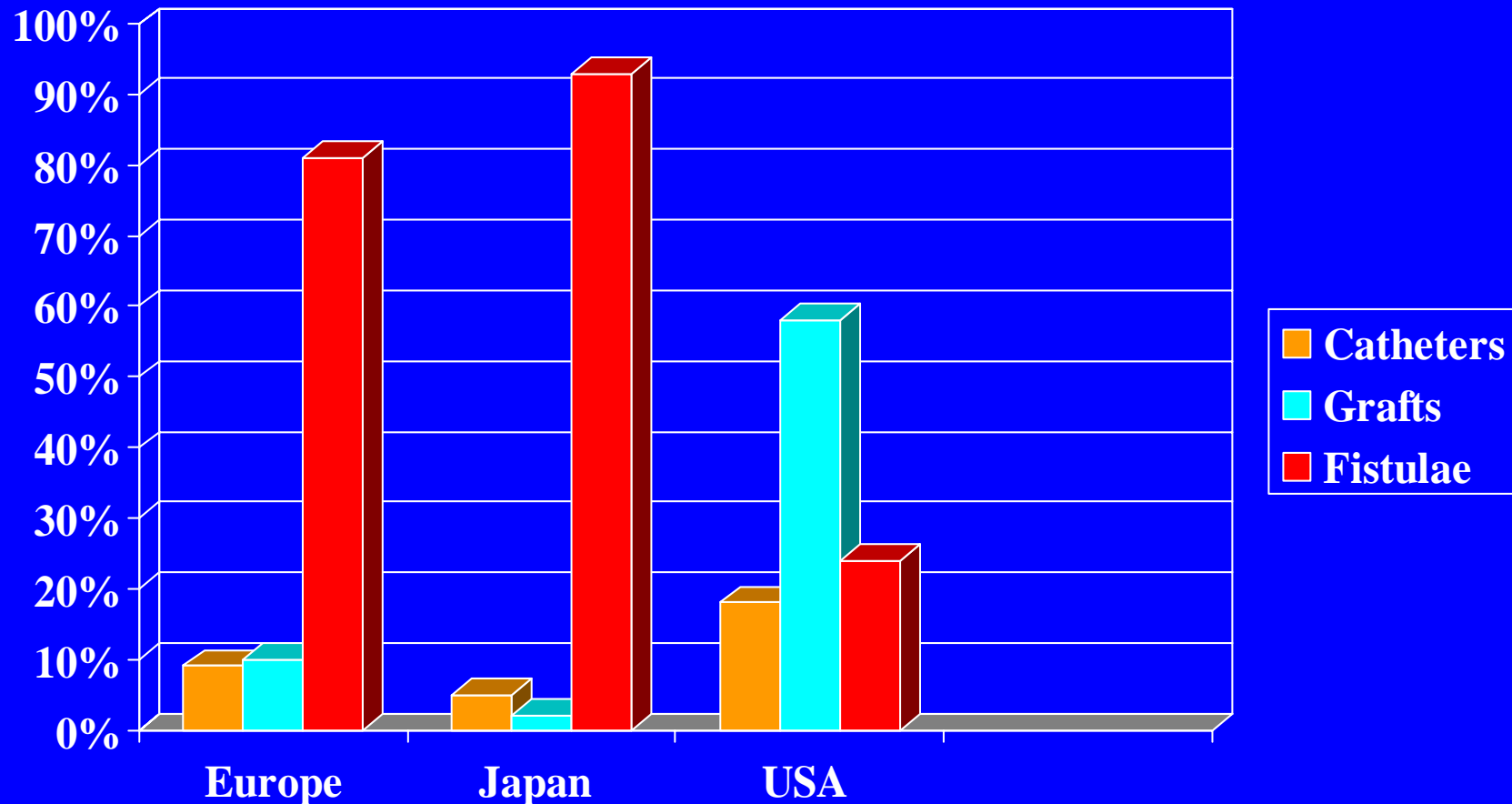
Why AV Fistulae?

- ✓ What has your experience been?
- ✓ Are there Nephrology Professionals who aware that AVF is "Best Access" for HD patients"?

USA Clinical Performance Measures (CPM) Data Re: Vascular Access

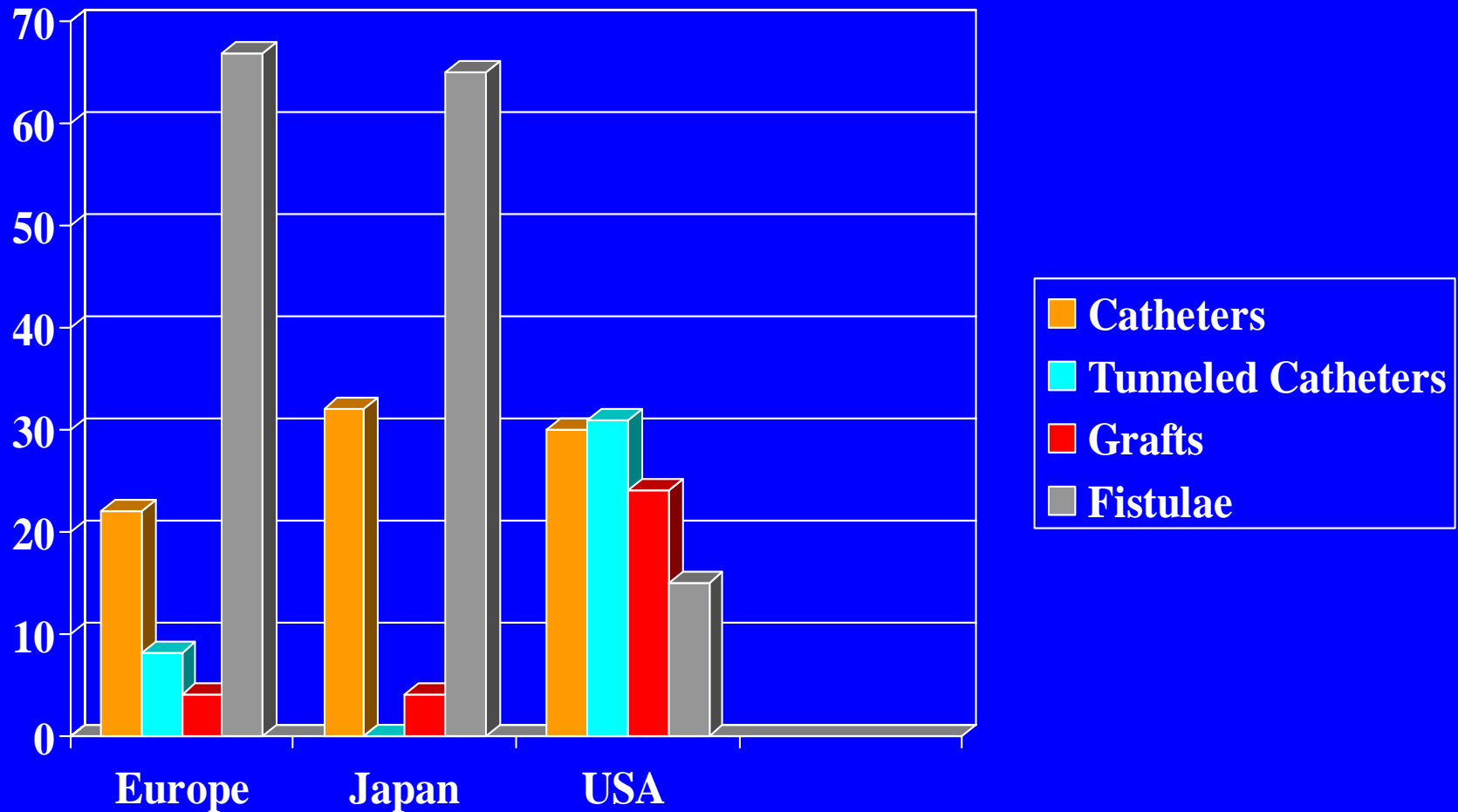
	<u>%AVF</u>	<u>%AVG</u>	<u>%CVC</u>
<u>2002</u>	31%	49%	26%
<u>2003</u>	33%	46%	21%

Vascular Access Use Prevalent Patients:



**Dialysis Outcomes Practice Patterns Study
(DOPPS)**

Vascular Access Use Incident Patients:



**Dialysis Outcomes Practice Patterns Study
(DOPPS)**

Opportunity to Increase AVF!

Tools:

- ✓ Team approach
- ✓ Work toward same Goals
- ✓ Education
- ✓ Communication

The ABCs of AV Fistulae

Today's Objectives:

- ✓ Identify AVF Vessel Selection and Maturation Assessment Techniques
- ✓ Describe AV Fistula Cannulation Steps
- ✓ Discuss Care and Cannulation of New AV Fistulae

The ABCs of AV Fistulae

AV Fistulae Pre-Operative Assessment Recommendations:

Optimum AV Fistula Creation

- ✓ Physical Assessment
- ✓ Vessel Mapping
- ✓ Referral for "AV Fistula Only"

The ABCs of AV Fistulae

Optimum AV Fistula Creation Physical Assessment:

- ✓ Look, Listen, Feel
- ✓ Check: Neck, Shoulders, Chest, Upper and Lower Arms, Digits
 - ✓ Signs of Central Vessel Trauma
- ✓ Scarring, Swelling, Vessel prominence
 - ✓ Has the Patient had Pacemaker, Central or PICC Lines?

The ABCs of AV Fistulae

Optimum AV Fistula Creation

Physical Assessment:

- ✓ Look, Listen, Feel

- ✓ Check:

- ✓ Arterial Pulses:

- Axillary, Brachial, Radial, Ulnar

- ✓ Blood Pressure in both Extremities
B/P Differences >20mmHg?

- ✓ Allen's Test for
Radial and Ulnar Artery Sufficiency

The ABCs of AV Fistulae

Optimum AV Fistula Creation

Physical Assessment:

- ✓ Look, Listen, Feel

Venous Exam:

- ✓ Identify Veins:
 - ✓ >2mm diameter <10mm depth
- ✓ Easily Dilates (2x) Minimal Compression
 - ✓ Straight segments for Cannulation
- ✓ Raise Arms to check if Veins "Flatten"
Check for "outflow obstructions"

The ABCs of AV Fistulae

Optimum AV Fistula Creation Arterial and Venous Mapping

✓ Either Dye Study or UltraSound (US)

✓ Check:

✓ Arterial Diameters: $>2.5\text{mm}$

✓ US can check for arterial calcification

✓ Expect Arterial Blood Flows to increase $>10\text{x}$

The ABCs of AV Fistulae

Optimum AV Fistula Creation Arterial and Venous Mapping

- ✓ Either Dye Study or UltraSound

Venous Exam:

- ✓ Identify Veins which may not be visible or palpable:
 - ✓ >2mm diameter
 - ✓ <10mm depth
- ✓ Easily Dilates (2x) Minimal Compression
- ✓ Vessel Continuity with Central Veins

The ABCs of AV Fistulae

AV Fistulae Pre-Operative Assessment Recommendations:

Optimum AV Fistula Creation

- ✓ Referral for "AV Fistula Only"
 - ✓ Know Surgical Skill, Expertise
 - ✓ Dialysis Team
 - ✓ Access Type Preference Effects
- Access Choice (DOPPS KI 2002)

AV Fistulae Maturation Assessment

- ✓ Considerations of AV Fistula Development
- ✓ Role of Surgical expertise for AV Fistula Development
- ✓ Role of Exercise for AV Fistula Development
- ✓ How do we know AV Fistula is Mature enough for Cannulation

AV Fistulae Maturation Assessment

Role of Surgical Expertise for AVF Creation and Development

- ✓ Skilled, Experienced Surgeon
- ✓ Surgeons may or may not know what we "need" for Dialysis
- ✓ What is Adequate Vascular Access BloodFlow?
 - ✓ Post-op AV Access BloodFlow increases 10-20x > Pre-op levels

AV Fistulae Maturation Assessment

Role of Surgical Expertise for AVF Creation and Development

- ✓ Skilled, Experienced Vascular Access Surgeons need Education and Communication, too
 - ✓ Accesses not Maturing
 - ✓ Difficult Cannulations,
- ✓ Access Too Deep, Too Short, Under Scar, etc.

AV Fistulae Maturation Assessment

Role of Surgical Expertise for AVF Creation and Development

- ✓ U of Michigan (AJKD July 2003)
- ✓ Oct 1997- April 2001 3.5 years
- ✓ 9 Member Surgeon Group **committed** to increasing AVF's
- ✓ 260 % increased AVF Outcomes
- ✓ Observed: Surgical skill improved
>12 AVF's created

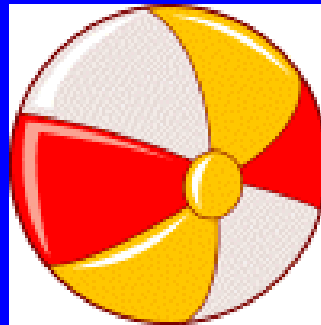
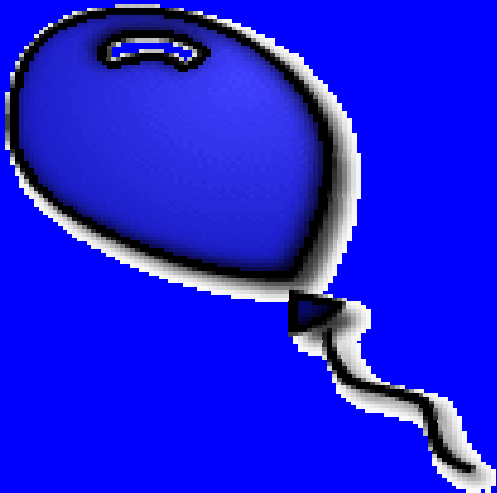
The ABCs of AV Fistulae

Communicate new concepts:

★ AV Fistula Maturation

★ Lumen Diameter > 4mm

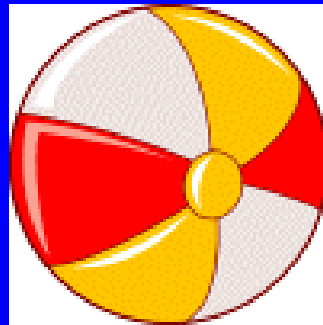
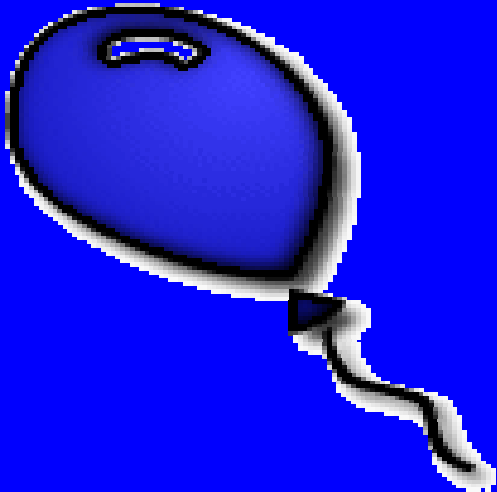
★ Vein Wall Thickness:



The ABCs of AV Fistulae

What Causes AV Fistula Maturation?

- ★ Increased Arterial Inflow causes Increase in Vessel Diameter and Wall Thickness (10-20x)
- ★ Everything which increases bloodflow helps mature AVF



The ABCs of AV Fistulae

AV Fistulae Cannulation Recommendations:

Assessment of Patient with an AVF

✓ Assess Whole Patient

✓ Special considerations of Cardiovascular System

✓ Blood Flow in AVF related to B/P

✓ Particular Observations for s/s of infection

The ABCs of AV Fistulae

AV Fistulae Cannulation Recommendations:

Assessment of Patient with an AVF

✓ Assess Access Extremity Compare to
Opposite Extremity

✓ Color, Skin Integrity, Temperature,
Swelling, etc

✓ Numbness, Painful areas

✓ Equal Grip Strength

The ABCs of AV Fistulae

AV Fistulae Cannulation Recommendations:

Assessment of Patient with an AVF

✓ Assess Access itself

- ✓ Identify inflow, entire vessel, outflow
- ✓ Feel thrill; inflow through access to outflow
- ✓ Listen to Bruit; inflow through access to outflow
- ✓ Raise patients access arm observe vessel "flattening"

*New AV Fistulae Cannulation
Recommendations:*

- ✓ Match BloodFlow and Needle Gauge
 - ✓ Guidelines:
 - <250 ml/min 17 Ga
 - <350 ml/min 16 Ga
 - <450 ml/min 15 Ga
 - >450 ml/min 14 Ga

The ABCs of AV Fistulae

AV Fistulae Cannulation Recommendations:

- ✓ Identify Cannulation Sites Clean and Prep per P&P
- ✓ Engorge AV Fistula with tourniquet for cannulation only
- ✓ Cannulate site with a 25 degree angle
- ✓ Observe "back flash" then flatten angle of insertion
- ✓ Insert Needle completely
- ✓ Remove Tourniquet
- ✓ Secure and Tape per P&P

The ABCs of AV Fistulae

New AV Fistulae Cannulation Recommendations:

- ✓ Considerations for New AV Fistula
 - ✓ Ready to cannulate?
 - ✓ Expert “sticker”
 - ✓ Needle Gauge? Blood Flows?
 - ✓ Tourniquet?
 - ✓ One needle?

Why Focus on Vascular Access Cannulation Skills?

Developing Vascular Access Cannulation Skills

We increased AV Fistulae

Now What?

**Today, we are creating more AV
Fistulae, but...
not the
AV Fistulae of the 70's**

**Today's Patients are different
How?**

**Today's Fistulae are different
How?**

Today's patients and veins are:

- ★ Older
- ★ Diabetic /Co-morbid
- ★ Fragile
- ★ Slower to heal
- ★ Previously traumatized

We increased AV Fistulae

Now, We have increased:

- ★ **Severe Infiltrates**
- ★ **Traumatized, "Lost" Vessels**
- ★ **Failed Fistulae Development**
- ★ **Frustrated Staff, Patients,
Nephrologists, Surgeons**

The ABCs of AV Fistulae

New AV F Cannulation Recommendations:

- ✓ Considerations for New AV Fistula
- ✓ Evaluate adequate vein enlargement at 4 weeks
 - ✓ AVF mature enough to cannulate?
- ✓ Time is not the only factor and more time may not help
 - ✓ Sufficient Arterial inflow is Required
- ✓ Blood Flow not diverted to Side Vessels
 - ✓ No Stenotic areas diminishing flow

The ABCs of AV Fistulae

New AV F Cannulation Recommendations:

- ✓ Considerations for New AV Fistula
- ✓ If AVF is not maturing What is the Plan?
 - ✓ Very common for AVF to require minor procedures to improve development
 - ✓ Interventionalists may dilate stenotic areas
 - ✓ Surgeon may revise anastomosis...

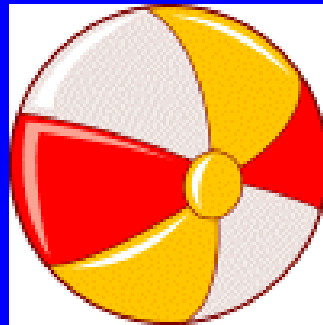
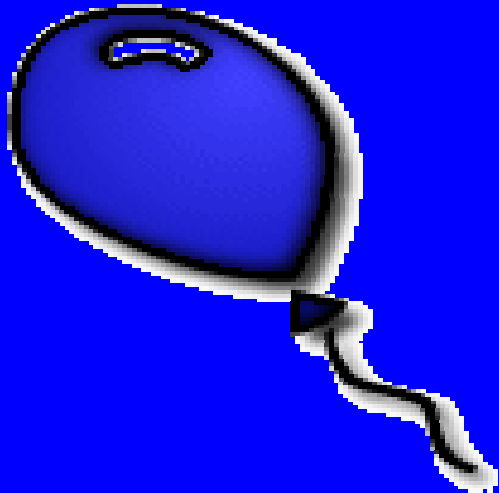
The ABCs of AV Fistulae

New AVF Cannulation Recommendations:

★ AV Fistula Maturation

★ Lumen Diameter > 4mm

★ Vein Wall Thickness:



The ABCs of AV Fistulae

New AVF Cannulation Recommendations:

- ✓ Identify Cannulation Sites Clean and Prep per P&P
- ✓ Engorge AV Fistula with "lightly" placed tourniquet for cannulation only
- ✓ Cannulate site with a 25 degree angle
- ✓ Observe "back flash" then flatten angle of insertion
- ✓ Do Not touch the sides/back of vessel
- ✓ Gently Insert Needle completely
- ✓ Remove Tourniquet
- ✓ Secure and Tape per P&P

The ABCs of AV Fistulae

New AV F Cannulation Recommendations:

- ✓ Considerations for New AV Fistula

 - ✓ Only "Expert" cannulators

 - ✓ Start with "smaller" Gauge Needles
advance Gauge as tolerated

- ✓ Adjust BloodFlow along with Needle Gauge

 - ✓ May use one needle and return through
other access (CVC) (KDOQI VA Guideline #9)

 - ✓ May need to adjust anticoagulation

Opportunities:

- ★ Know requirements of “successful” AV Fistulae
- ★ Teach Patient and Care Team basics
 - ★ Assess, Plan, Implement, Evaluate
- ★ Identify Recognize “Cannulation Experts”

Opportunities:

- ★ **“Grow” Assessment Skills of Patients, Extremities and Accesses**
- ★ **Communicate Success Stories!**
 - ★ **Document, Publish, Speak**

The ABCs of AV Fistulae

Colleagues Please Share:

- ★ Your experiences with Barriers to increasing functioning AVF
- ★ Your experiences with Solutions to Overcoming these Barriers to increasing functioning AVF

Colleagues Please Share:

- ★ What has been the biggest surprise in your Assessment and Cannulation skill development?
- ★ How did you share this with your team?