

## Points to Consider:

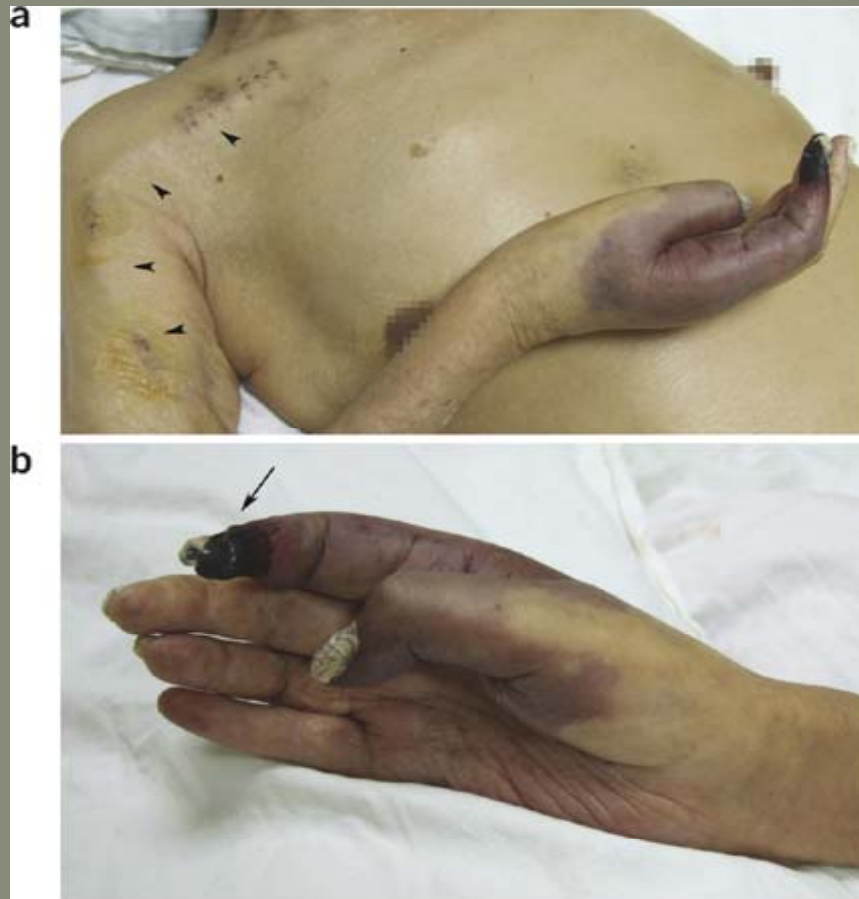
- Transition from an AVG to an autogenous AVF in all patients where appropriate & feasible
  - *ideally prior to graft loss.*
- K/DOQI guideline 29
  - “*every* patient should be re-evaluated for construction of an autogenous AV fistula after failure of *every* dialysis AV access”

# Arterial steal

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- Steal is physiologic
- occurs in:
  - 73% of AVF
  - 91% of AVG
- Usually asymptomatic not requiring treatment
- Symptomatic steal occurs in patients who are unable to develop collaterals or support direct flow to offset steal

# SEVERE consequences of Steal



# Assessing for steal



# Prevention

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- Diabetics and patients with neuropathy evaluated carefully
  - Arterial physiological and imaging studies
- Arteriography considered before access in high risk patients
- Careful neurological evaluation
  - Pre-op, post-op
  - Document
- Surgeon may avoid the brachial artery as inflow artery



# Risk of Rupture: slide courtesy of ESRD Network 13

## Fatal Vascular Access Hemorrhage



- Evaluate access and surrounding skin each dialysis treatment
- Aneurysms need to be monitored on a regular basis to avoid disaster!
- Be sure your patients and their caregivers are educated on what to do if bleeding happens at home!

### Aneurysm

Brachiocephalic fistula with an aneurysm at the arterial anastomotic site. The aneurysm has a tight, shiny skin. The patient needs to be referred for an urgent surgical evaluation before a catastrophic event occurs.

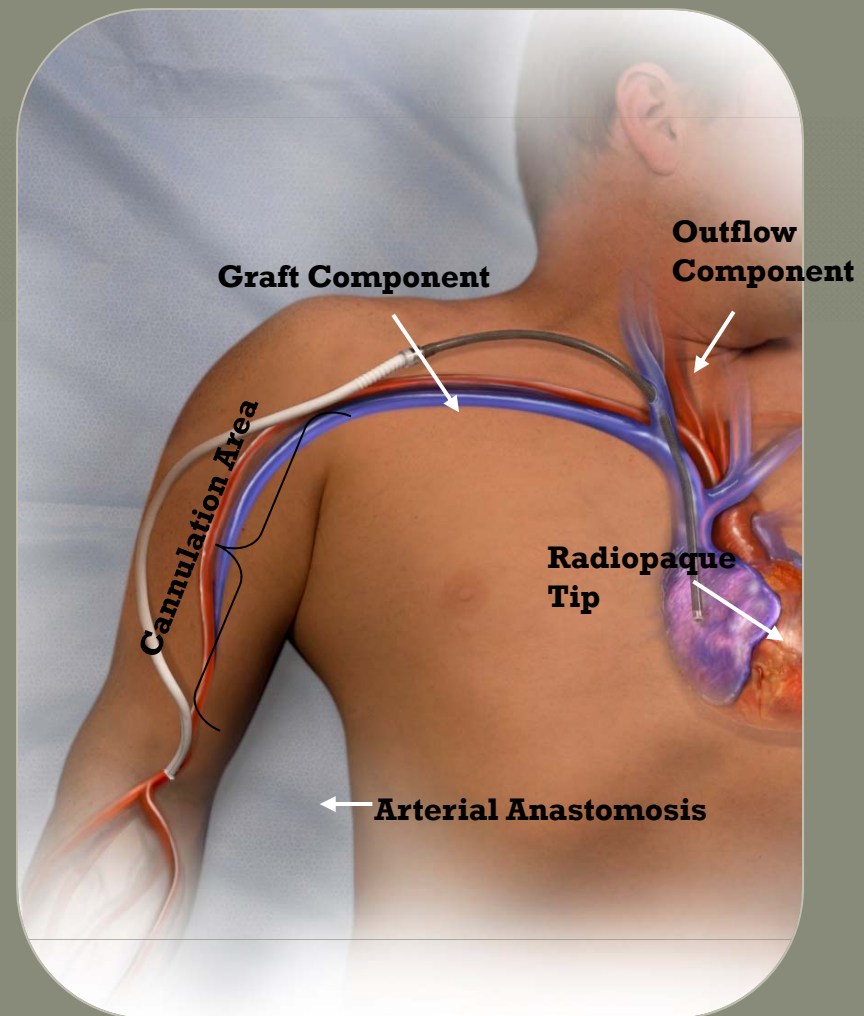


How many of you have ever seen/known of a patient hemorrhaging from access?

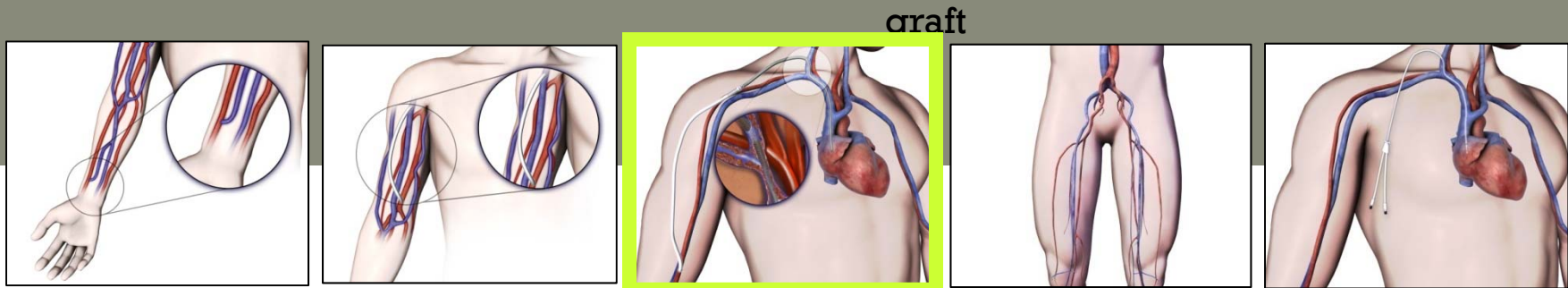
What are your patients told to do to stop the bleeding?

# HeRO Graft: A Potential Solution to Catheter Dependence

- Fully subcutaneous surgical implant
- AV access with continuous outflow into the central venous system
- Traverses central venous stenosis allowing for long-term hemodialysis access



# Dialysis Access Algorithm<sup>1</sup>



<sup>1</sup> SCVS, 37th Annual Society for Clinical Vascular Surgery Meeting, Orlando, FL, March 2009, Christopher L. Stout, MD, Jean M. Panneton, MD, and Marc H. Glickman, MD, Division of Vascular Surgery, Eastern Virginia Medical School, Norfolk, VA



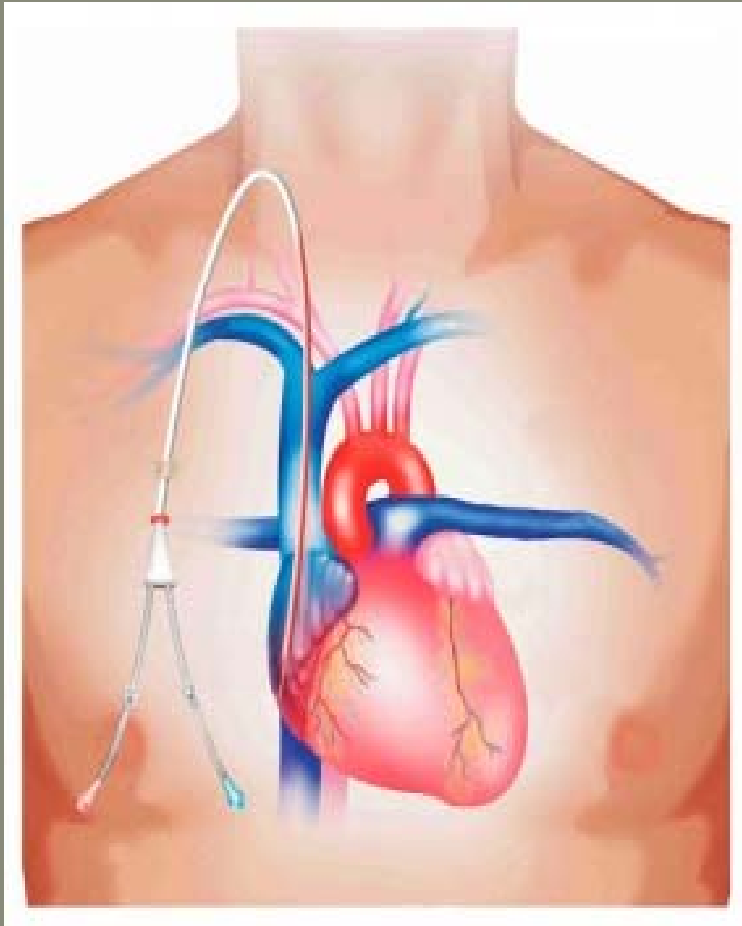
## What's the Big Deal about Starting with a Catheter?

# Hemodialysis Vascular Access Modifies the Association between Dialysis Modality and Survival

Perl J et al. JASN 4/21/2011

Patients who received hemodialysis with a central venous catheter had an 80 % higher risk of death in the first year after starting dialysis than those patients with an AVF or AVG or on PD

# Central Venous Catheter



## Advantages

- Can be used immediately after placement

## Disadvantages

- Higher infection rates
- Increased hospitalizations
- May require longer treatment times
- Cannot get site wet
- High rate of clotting requiring frequent procedures
- Risk of destroying important vein

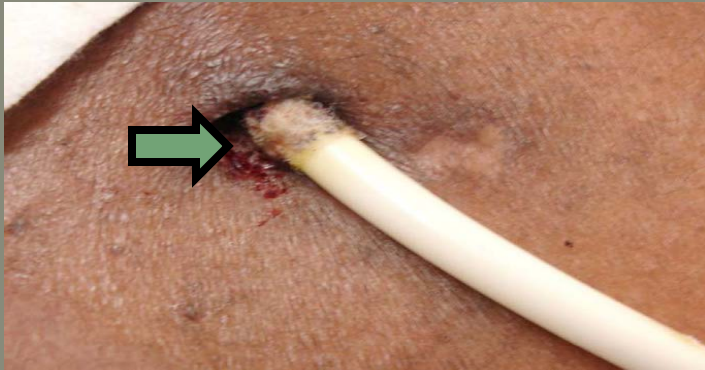
# Catheters

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- **Enormous problem:**

- > 80% patients start HD with a catheter
- 71.9% incident ESRD patients at first outpatient dialysis session
- > 50% of incident outpatient ESRD are still using a CVC at 90 days.

# CVC-related Infections



Exposed cuff



Exit site infection



Disrupted tunnel

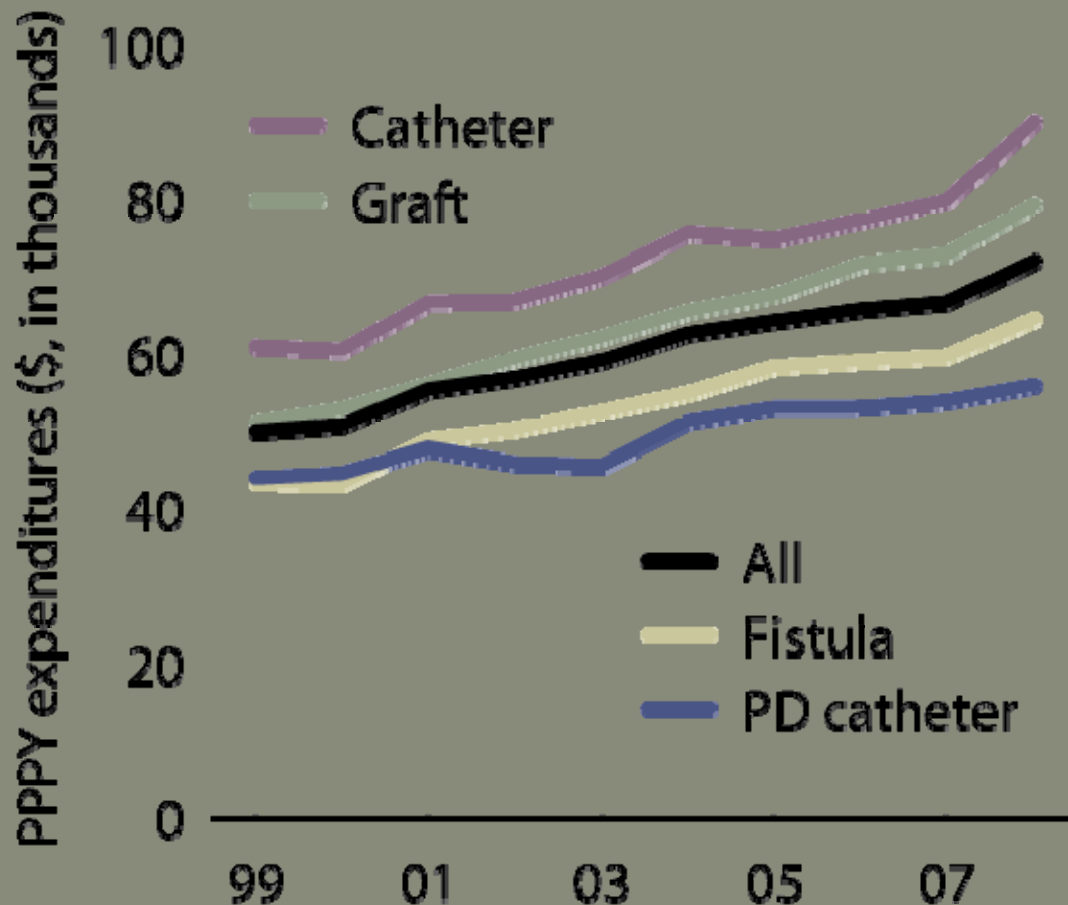


Tunnel infection



# Per person per year total expenditures, by access type

Figure 11.19 (Volume 2)



Period prevalent hemodialysis patients. Costs determined as the payment amount for each line-level access procedure billed through physician/ supplier claims.

## Cost & morbidity by HD access type

2009 annual cost of HD patient \$82,285

	<b>AVF</b>	<b>AVG</b>	<b>CVC</b>
PPPY Total Expenditure	\$58,588	\$72,729	\$79,364
PPPY Access Event Costs	\$3,194	<b>\$7,451</b>	\$5,960
Vascular Access Intervention Events – Removal (Annual)	0.4%	<b>13.3%</b>	1.2%
Vascular Access Intervention Events – Replacement (Annual)	0.9%	0.8%	24.5%
Vascular Access Intervention Events – Thrombectomy (Annual)	4.1%	<b>14.4%</b>	1.1%
Vascular Access Hospitalizations -- for Infection (Annual)	1.2%	2.8%	<b>13.3%</b>

PPPY, per patient per year

# Catheter-related Bloodstream Infection (CLABSI)

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- CVC responsible for ~ 50% of all HD infections
- 15 – 25 x higher than AVG & AVF respectively
- Leading cause of catheter removal and loss of future access sites
- 100,000 episodes per year in US
  - \$22,000 per episode

# Infection

- Lower rate with AVF compared with other access types<sup>1,2</sup>
- *Staphylococcus aureus* the most common pathogen<sup>2</sup>
- Patients and dialysis team personnel have high prevalence of *Staphylococcus* on skin<sup>3</sup>
- Handwashing before, after, and between patients is critical<sup>4</sup>

1. National Kidney Foundation. *Am J Kidney Dis*. 2006;48(suppl 1):S1-S322.

2. Dialysis Outcomes and Practice Patterns Study (DOPPS) Guidelines. Available at: [www.dopps.org](http://www.dopps.org).

3. Kirmani N, et al. *Arch Intern Med*. 1978;138:1657-1659.

4. Boyce JM, Pittet D. *MMWR* 2002;51(RR16):1-44.





## CDC Hand Hygiene Poster

[www.CDC.govujj](http://www.CDC.govujj)

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“Wait, this one’s a lawyer. We’d better wash our hands.”



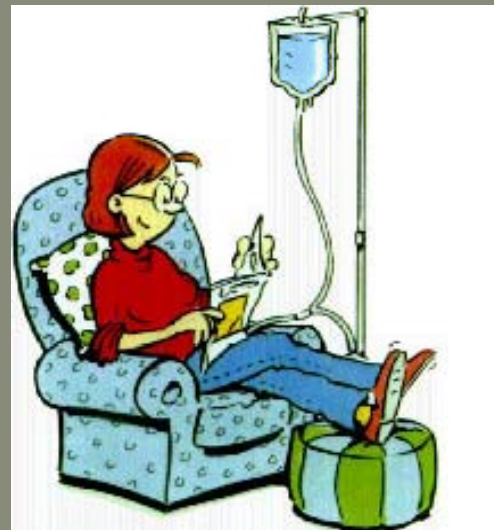
# How Clean is Your Stethoscope?

Marinella MA, Pierson C, Chenoweth C. The stethoscope. A potential source of nosocomial infection? *Arch Intern Med* 1997 Apr 14;157(7):786-90.



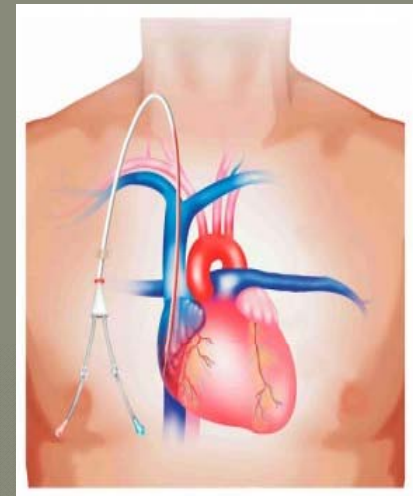
— Don't forget about the “Other Catheter”!

- Peritoneal Dialysis should be considered on all medically suitable patients





# How Do We Know Which Is the Best Access for the Individual?



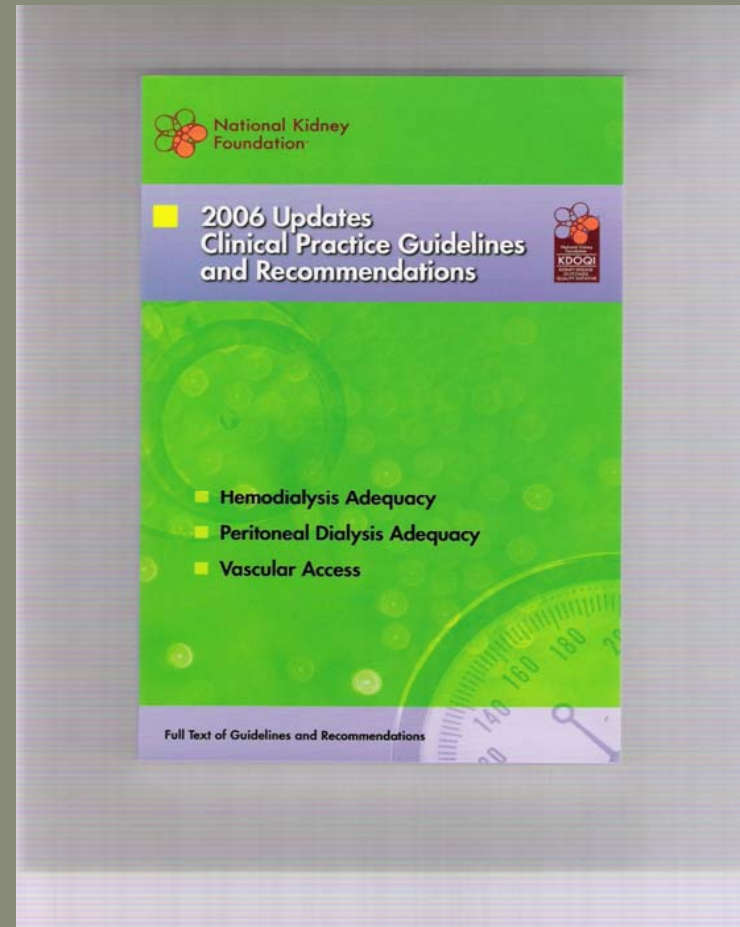
# Conditions for Coverage

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- **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”.

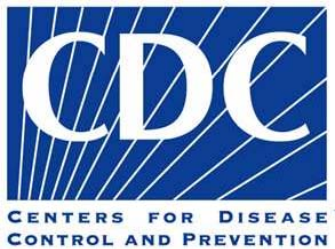
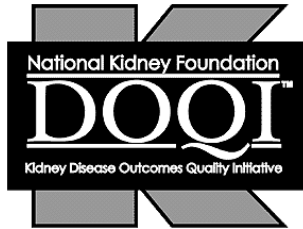
# KDOQI GUIDELINE 2. SELECTION AND PLACEMENT OF HEMODIALYSIS ACCESS

- **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.**





# Vascular Access in the Spotlight



↓ TCC

↑ Longterm Access

↑ Dialysis Adequacy


↓ Bacteremias



*“ Use of catheters as first choice for long-term vascular access is discouraged because of infection, susceptibility to thrombosis and inconsistent delivery of blood flow... Long-term catheters should be used in conjunction with a plan for permanent access.. ” - KDOQI Guidelines*



## Adequate Access = Adequate Dialysis

- It's all in the delivery
- You can only dialyze as much blood as you can get to the dialyzer!
- Bottom Line  No access = No hemodialysis

# Takeaway Message:

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1. Vascular Access is the Patient's lifeline
2. It takes a team and a CQI process to assure that patient-centered care is given to achieve ideal vascular access outcomes
3. While we preach – Fistula First and Catheter Last – remember that this is a person we are talking about – not just an access for HD

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**Thank you for your  
attention!**

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[www.fistulafirst.org](http://www.fistulafirst.org)