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Vascular access for hemodialysis

Rick Hayashi, Edmund Huang and Allen R Nissenson*

SUMMARY

Establishing and maintaining adequate vascular access is essential to providing an appropriate dialysis dose in patients with end-stage renal disease. Complications related to vascular access have a significant role in dialysis-related morbidity and mortality. The National Kidney Foundation Kidney Disease Outcomes Quality Initiative (K/DOQI) clinical practice guideline for dialysis access was last updated in 2000 and provides a framework for the optimal establishment and maintenance of dialysis access, and treatment of complications related to dialysis access. This paper reviews the 2000 K/DOQI dialysis access guideline as well as updated information published subsequently.

KEYWORDS arteriovenous fistula, arteriovenous graft, dialysis access, end-stage renal disease, hemodialysis

REVIEW CRITERIA

Material for this article was found by searching both the PubMed and MEDLINE search engines using the terms, "dialysis access", "arteriovenous fistula", "arteriovenous graft", "dialysis access and anticoagulation", "dialysis access and thrombosis and stenosis", "dialysis access and infection", "dialysis access and digital ischemia", and "dialysis access and heart failure."

R Hayashi is a senior nephrology fellow at UCLA Medical Center, E Huang is a fellow in nephrology at UCLA Medical Center, and AR Nissenson is Professor of Medicine and Director of the Dialysis Program at the David Geffen School of Medicine at UCLA, Los Angeles, CA, USA.

Correspondence
*David Geffen School of Medicine at UCLA, 200 Peter Morton Medical Building, Ste 55–59, MC: 694524, Los Angeles, CA 90095, USA
anissenson@mednet.ucla.edu

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INTRODUCTION

Vascular access to obtain a functional portal to a patient's circulatory system is vital to delivering adequate hemodialysis therapy. The ideal hemodialysis access would fulfill three criteria. It would have a long use-life, provide an adequate blood flow rate to achieve the dialysis prescription, and have a low rate of associated complications. Currently no form of hemodialysis access perfectly achieves all three criteria; however, the native forearm arteriovenous fistula (AVF) comes closest, with studies showing that this form of access provides the best 4–5-year patency rates and requires the fewest interventions. Following the forearm AVF, in order of preference, are the upper-arm AVF, the arteriovenous graft (AVG) and the cuffed central venous catheter.[1,2]

EPIDEMIOLOGY

In 1997 the Kidney Disease Outcomes Quality Initiative (K/DOQI) was created in an attempt to form a consensus guideline based on both evidence and opinion to improve and standardize renal care, including care related to dialysis vascular access.

The most recent K/DOQI guideline for vascular access was published in 2000; an update of this guideline is expected to be published in 2006. The 2000 guidelines recommend that at least 50% of patients electing to receive hemodialysis for renal replacement therapy should have a native AVF placed, and that 40% of prevalent dialysis patients should have a native AVF. Since the publication of this guideline, numerous studies have shown a graded mortality risk dependent on access type, with the highest risk associated with central venous dialysis catheters, followed by AVGs and then AVFs.[3,4] The Choices for Healthy Outcomes in Caring for ESRD (CHOICE) study examined mortality based on access type in 616 incident hemodialysis patients for up to 3 years of follow-up. In this study, central venous catheters and AVGs were associated with approximately 50% and 26% increased mortality, respectively, compared with AVFs. Increased risk of mortality