



haemodialysis

Commencing haemodialysis with appropriate vascular access

Why is this important?

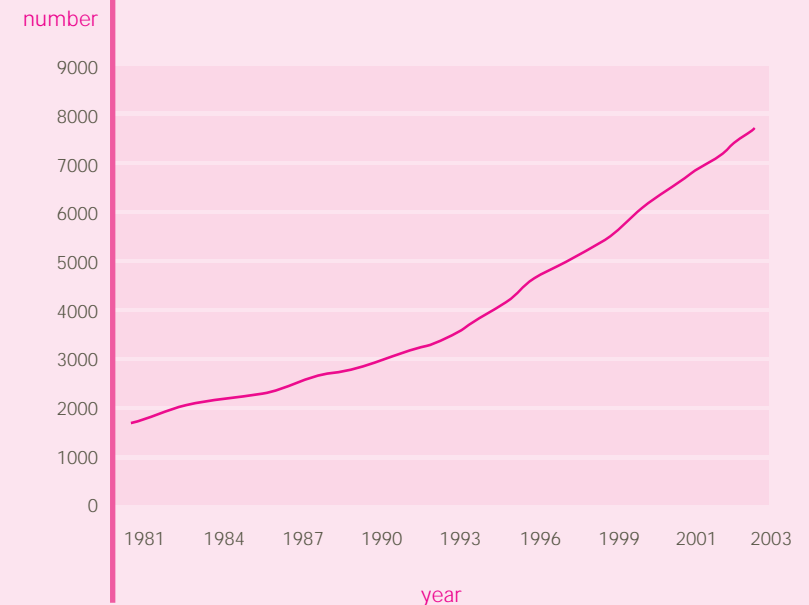
The incidence of end-stage (renal) kidney disease (ESKD) has increased in Australia in the last 20 years. Patients with ESKD die unless they receive the life-saving therapies of dialysis or renal transplantation. In 2003, there were 7,674 patients receiving dialysis treatment in Australia, around 75 per cent of whom were on haemodialysis [1].

For long-term haemodialysis, the construction of the native arteriovenous fistula (AV fistula) is needed to create permanent access to the veins. This is a surgically constructed connection between a peripheral artery and a vein, which takes several weeks to mature before it is functional. In the knowledge that dialysis will become necessary, this procedure can be performed some months in advance of the commencement of dialysis.

There are two alternatives to the AV fistula. The first is the arteriovenous graft (AV graft), which is surgically constructed by implanting a synthetic tube in the arm between an artery and a vein. This procedure is utilised in a small percentage of patients for whom an AV fistula cannot be constructed. The second alternative is the central venous catheter, which is a synthetic catheter implanted in a large vein in the neck. The use of the central venous catheter is regarded as an immediate, temporary form of vascular access. It is associated with increased morbidity and mortality, as well as higher costs to the health care system.

Nearly half the patients commencing haemodialysis have access created via a central venous catheter. However, with early referral and planning, this figure could be significantly reduced and the consequent risks to health avoided.

People on dialysis in Australia 1981–2003



Source: ANZDATA Registry Report 2004 (from Excell L, McDonald S 2004)

New patients commencing haemodialysis with a catheter have a two to three-fold increased risk of death compared to those with an AV fistula.

Best available evidence

The AV fistula is the haemodialysis vascular access of first choice for a number of reasons. Firstly, patients with an AV fistula are less likely to be admitted to hospital to maintain function of the vascular access, consequently reducing morbidity associated with the haemodialysis treatment [2, 3]. This, in turn, vastly reduces the costs associated with the treatment [4]. Secondly, given the synthetic nature of the catheter and graft materials, patients with catheters and AV grafts have a higher risk of infection compared to patients with an AV fistula [5]. Studies show that new patients commencing haemodialysis in Australia (and New Zealand) with a catheter have a two to three-fold increased risk of death (all cause and infectious mortality) compared to those with an AV fistula [6].

International evidence-based guidelines attest to the advantages of the AV fistula [2, 7]. Indeed, the Institute for Healthcare Improvement in the

United States is leading a national 'Fistula First' initiative to increase the use of AV fistulas at the commencement of dialysis [8]. Locally, it is recommended that patients requiring vascular access should be assessed by a surgeon skilled in vascular access well before the anticipated start of haemodialysis. This is to ensure that the AV fistula is functioning well at the commencement of dialysis, following a four to six-week maturation period [3].

Current practice

While the overall prevalence of AV fistula use in Australia is high (75 per cent of patients dialyse with an AV fistula), only 48 per cent of new patients commence haemodialysis treatment with a functional AV fistula [9]. Forty-six per cent of patients require insertion of a temporary catheter to commence treatment until the AV fistula can be constructed, whilst less than five per cent of patients commence treatment with an AV graft [9].

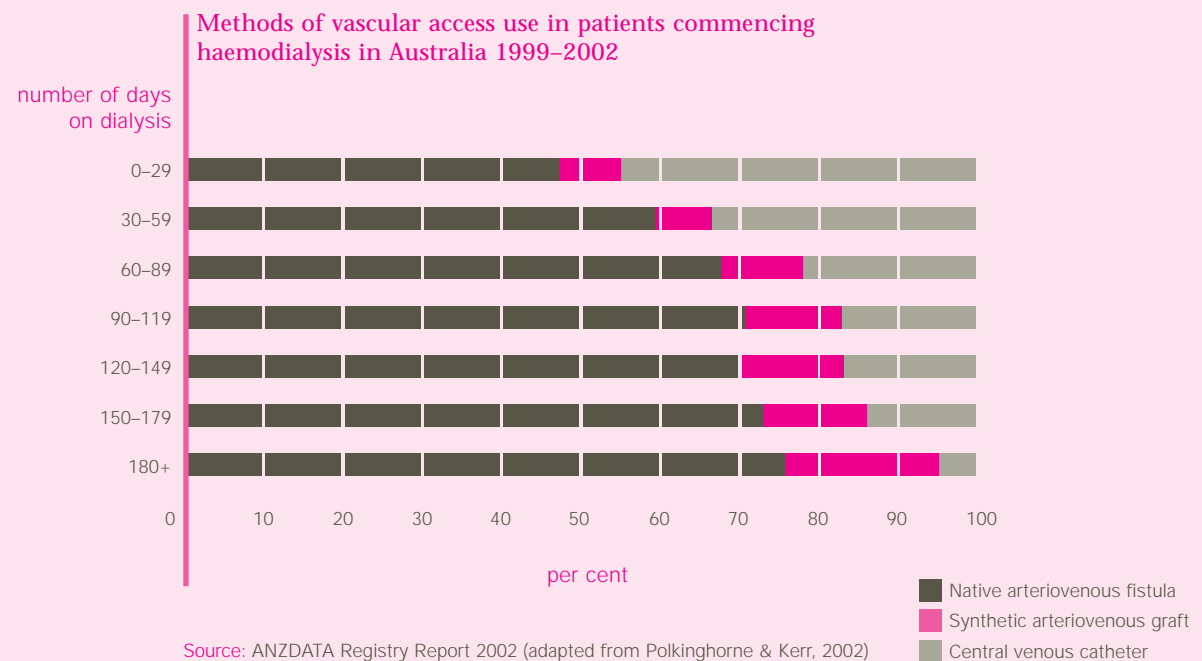
The increased use of catheters over the years 1999 to 2002 [6] is cause for concern. Delayed or late presentation to the nephrologist, preventing the timely creation of an AV fistula, is the most important predictor of catheter use [10]. The prevalence of catheter use in patients who did not present late is also very high (38 per cent) [9]. Also, in Australia, catheter (and AV graft) use varies significantly across the states and territories, even after adjustment for differing patient characteristics [10].

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Implications

- Typically, ESKD occurs after years of chronic renal failure which has progressed to the point where kidney function is less than 10 per cent of normal. In most cases, patients and their doctors recognise that at some future point long-term haemodialysis will become necessary. Early planning for this eventuality enables patients to commence dialysis with the most appropriate form of vascular access, which in the majority of cases is the AV fistula.
- The decision about vascular access should be made jointly by the physician, surgeon and patient after assessment and education. Patient information should include material on the different methods of vascular access, pointing out the benefits of creating an AV fistula as soon as practicable.





- Catheter use in new patients commencing haemodialysis treatment is unacceptably high in Australia, exposing patients to excess morbidity and risk of death. Compared to catheters and AV grafts, AV fistulas result in significantly lower rates of complications, such as infection and clotting, longer patency, fewer hospitalisations and significantly lower costs.
- Quality improvement programs and a coordinated multidisciplinary approach to pre-ESKD care are needed to help clinicians reduce catheter use in new haemodialysis patients. The factors associated with high catheter use are complex and vary according to locality of treatment [10].
- Given the rising incidence of patients requiring long-term haemodialysis, the issue of ensuring timely vascular access is of paramount importance.

References

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