INTRODUCTION

The 1980s will be regarded as the decade during which home patient services emerged as a practical alternative to prolonged hospitalization for many patients. Early experiences with venous access for renal dialysis and hyperalimentation have provided a foundation upon which other efforts have been based. This has resulted in an increased capability for longterm venous support for a wider spectrum of problems. We have learned that longterm out-patient venous access can be accomplished safely without the many complications usually associated with this procedure. This has enabled us to eliminate the venous catheter tether which required the patient’s confinement in order to achieve adequate therapy. Now, patients receiving nutritional support, chemotherapy, antibiotics and many other parenteral forms of medication can be treated safely on an out-patient basis through indwelling venous lines. Thus, therapy designed to extend life need no longer interfere with the quality of life.

Many of the early techniques of longterm venous access were designed to provide a route for nutritional support solutions. In fact, much of our knowledge about catheter placement, catheter material and catheter maintenance has come from the need for longterm access. Technical complications of insertion and the associated complications of longterm placement have provided the stimulus for the re-evaluation of techniques, materials and basic concepts. This re-evaluation has meant that there is now one catheter system that can be modified to fit many needs with a minimum risk of complications. The end result is a system of access that not only provides for safe in-house parenteral therapy but one that may also be used on an out-patient basis for longterm support.
The introduction of plastic catheters significantly altered intravenous therapy. These materials (polyvinyl chloride, polytetrafluoroethylene) resulted in significantly increased mean infusion time. Unfortunately, these materials were also associated with an increased incidence of venous complications. Numerous publications compared the infusion times and associated complications of each of these materials\textsuperscript{1,2}. Concepts such as fibrin sleeve formation, intimal damage and thrombus formation were formulated and associated with shortened infusion times, catheter sepsis and direct venous complications\textsuperscript{3,4}. Ultimately, one material — silicone — was identified as 'ideal' as it had the lowest incidence of untoward complications and the longest infusion times. As the use of this material gained in popularity it was incorporated into special catheters designed for longterm out-patient venous access (e.g. Hickman, Broviac)\textsuperscript{5,6}. These catheters, composed of silicone with various Dacron attachments or sheaths were designed for surgical implantation using a tunnelled approach. During the past 10 years they have served as the most common means of administering nutritional support solutions and/or chemotherapeutic drugs to patients with problems of longterm access. Conceptually, the advantage of using a tunnel approach is based upon the theoretical association between catheter sepsis and migration of surface bacteria along an insertion tract. Thus, any technique that increases the anatomical distance between the insertion site and the circulation may well reduce the incidence of catheter-related sepsis. Recent evidence, however, seems to dispute this concept\textsuperscript{7}. In addition, the

\textbf{Figure 32.1} The catheter system