Medical care in hospitals is increasingly complex and expensive. Hospitalization is required for a variety of reasons including the need for surgery, nursing care, and diagnosis and stabilization of serious diseases. Many hospitalized patients require parenteral therapy and it is not uncommon for patients to remain in hospital solely to receive intravenous antibiotics because no suitable oral alternative exists. Since the late 1970s, in the USA, such patients have increasingly been treated on an outpatient basis (Kind et al., 1979, Poretz et al., 1982). What are the reasons for providing outpatient intravenous (IV) antibiotic therapy (OPIVAT), what conditions are suitable for such an approach and how can such treatment be delivered?

In the USA, much of the pressure to develop OPIVAT has arisen from a desire to decrease costs associated with hospital stay as well as from patient pressure to return home and to work as early as possible. In other settings where OPIVAT is beginning to be developed, such as the UK and the Netherlands, while cost is an important concern, there are also issues to do with reduced number of acute hospital beds, more complicated infections requiring prolonged iv antibiotics and increased patient expectations of early discharge and community care.

A variety of infections are amenable to OPIVAT, the most common ones being soft tissue infections and orthopaedic infections (Williams, 1995). With careful selection, patients with endocarditis (Stamboulian et al., 1991; Francioli et al., 1992), pneumonia (Morales & Snead, 1994) and pyelonephritis (Millar et al., 1995) can be treated outside hospital. In addition, the increasing number of AIDS patients with cytomegalovirus retinitis often receive outpatient iv antiviral agents and sometimes antibiotics (Drew, 1988; Morales & von Behren, 1994). There is also increasing experience with OPIVAT for patients with neutropenia and fever, if carefully selected (Rubenstein et al., 1993; Talcott et al., 1994).

There are several models of OPIVAT delivery that may be appropriate in differing health care settings or for different patients. A common mode of delivery in the USA is the infusion centre (Poretz, 1991) which may either be in a hospital or may be an independent, commercial service. In this model, patients discharged on iv antibiotics attend the infusion centre to receive part or all of their treatment, continuing under the supervision of their referring physician in the outpatient clinic. Another model is the office-based OPIVAT programme where the patient attends the physician’s office for treatment and supervision (Tice, 1991). In the UK these two might be amalgamated so that patients are treated in the hospital outpatient department. With other models the patient is treated in their own home. The patient, or carer, may be trained to administer the antibiotics themselves or, as we do in Oxford, the patient is treated by a visiting nurse specialist (Kayley et al., 1996). In practice, any of the above models can be combined to suit individual requirements but, whichever model is used, it is necessary to have a well-trained multidisciplinary team to oversee the treatment programmes (Rehm & Weinstein, 1983). Such a team should include a physician with an interest in infection, a nurse specialist in iv therapy and a pharmacist.

Whatever the indication for OPIVAT or the mode of its delivery, there are several issues to be considered before the patient is discharged home. The most important involve the patient and their disease. It is essential reliably to diagnose the infection and to be sure that no suitable alternative oral antibiotic exists. The patient must be fully informed and willing to be discharged with OPIVAT. In addition, the patient must be medically and mentally stable for discharge. The home environment should be clean and
have running water and, ideally, the patient should have a telephone for accessing help. Intravenous access must be maintained and there are a variety of ways of ensuring this. Patients attending infusion centres may only require short peripheral cannulae, with heparin locks, which can be re-sited at the infusion centre every few days as required. Patients receiving OPIVAT at home or requiring prolonged treatment are usually better off with indwelling central venous catheters. These may be traditional Hickman or Broviac catheters or the newer peripherally inserted central catheters (PICC). PICC lines are now commonly used for OPIVAT and reduce the costs associated with traditional subclavian lines (Graham et al., 1991).

Two other important considerations are which antibiotics are suitable and how should they be infused? Although in practice any antibiotic can be used, those with pharmacokinetic profiles that allow once or twice daily dosing, such as ceftriaxone, vancomycin, teicoplanin and aminoglycosides are more suited to OPIVAT (Craig, 1995). Minimising the number of daily doses saves time, is cheaper, in terms of labour and disposables, and leads to less handling of the infusion line, thus reducing the risk of line-related sepsis. For home therapy it is important to know the shelf life of the diluted antibiotic preparation. Some, such as benzylpenicillin, may become inactivated relatively quickly at room temperature and others, such as vancomycin, may be stable for many days, particularly if refrigerated (Craig, 1995). Infusion of antibiotics outside hospital is relatively easy now that there are a variety of pumps and infusion devices available. These range from simple, disposable, pressurized plastic elastomeric devices which infuse the antibiotic against gravity at a constant rate through a filter (Rich, 1992), to sophisticated programmable electronic pumps capable of either continuous infusion or intermittent bolus dosing (New et al., 1991).

There are considerable advantages to OPIVAT. Studies in the USA have consistently shown that there are cost savings associated with OPIVAT (Balinsky & Nesbitt, 1989). In addition, patient satisfaction is increased because they can return home, increasing their autonomy, and often return to work while still on treatment. There can also be indirect advantages. Early discharge of one patient can lead to earlier admission of another, reducing waiting lists. Earlier discharge may also reduce the risk of nosocomial infections, an increasing problem in many hospitals.

OPIVAT is not without risks. Patients may feel insecure or unsupported at home. Line problems, such as thrombosis or infection, can occur. Anaphylaxis may be a worry but the risk should be very small if the patient receives their initial treatment in hospital. Also, there is the danger that treatment failure or complications may be recognised late, outside hospital. Nevertheless, most of these problems can be overcome with a motivated multidisciplinary team, proper training of all concerned and good communication between the hospital team, the patient and the community carers. Regular clinic supervision of patients on therapy is essential. General practitioners may feel they are being asked to do the hospital’s work without adequate recompense. A written shared care protocol to facilitate communication between the hospital and general practitioner is helpful and it is important that the general practitioner is contacted prior to discharge of the patient and is in agreement with the plans. In Oxford we have our home iv liaison nurses on-call for problems and patients have direct access to the infectious diseases ward, so the general practitioner is not troubled by any technical or clinical problems related to OPIVAT. Some general practitioners may want more active involvement in these cases and that is always welcomed.

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