

cost and insurance coverage frequently influence the model of care and, in some instances, the selection of antimicrobial agents for OPAT. For instance, Medicare patients without a secondary infusion benefit are typically required to choose between self-pay and receipt of antimicrobials in a SNF or infusion center, if available. Despite the availability of a number of dialysis-friendly agents [29], patients who receive their parenteral antimicrobials during dialysis sessions may be limited to a choice of vancomycin, cefazolin, or aminoglycosides only, depending on what their dialysis center is willing to pay for.

Therapeutic Considerations

Correct treatment begins with the correct diagnosis. Before embarking on a course of treatment, it is essential to identify the infection being treated. This includes gaining an understanding of the primary site of infection, the extent of infection around the primary site, and distant sites seeded secondarily. Additionally, treatment is always more effective if adequate source control is achieved, such as debridement of necrotic tissue, drainage of abscesses, and removal of infected prosthetic devices. Whenever possible, control at the primary site of infection should be addressed appropriately early in treatment.

The selected antimicrobial agent should have activity against the identified or presumptive causative pathogen(s), known distribution to the site of infection, and proven therapeutic efficacy in the infection being treated. Patient factors that may impact efficacy must be considered, including comorbidities, concomitant therapies (drug and non-drug), patient age, and organ function. Programmable infusion pumps and elastomeric devices (disposable balloons that push medication through tubing) have made it more convenient to use drugs that require multiple infusions a day. In general, for OPAT, drugs that allow for infrequent dosing and rapid/bolus infusions are preferred. However, if the resources exist to administer multiple doses of antimicrobials at home daily, efficacy should not be sacrificed for convenience.

Safety Considerations

While the types of adverse events observed with various antimicrobials would not be expected to differ in OPAT patients vs inpatients, the incidence of such reactions may differ. The cumulative incidence of adverse events to a variety of antimicrobial classes increases with length of treatment [29–33]. For some patients, OPAT courses may extend for weeks or months. Monitoring for adverse events while on treatment has been standard of care [1]; the particular tests required depend on the potential adverse event profile of the antimicrobials being administered. Additionally, some antiinfective agents require plasma concentration monitoring to ensure that they are in the desired therapeutic/nontoxic range (eg, vancomycin, aminoglycosides, and voriconazole). Occurrence of adverse events is a common reason for a change in antimicrobial agent or a complete discontinuation of OPAT [31, 33–36].

Administration Considerations

A suitable antimicrobial for OPAT should have favorable physical and chemical characteristics. The agent should have adequate stability, once reconstituted, in common IV solutions, in a variety of containers (plastic bags, syringes, elastomeric containers), and under various storage/use conditions. For example, ampicillin-sulbactam is only stable for 3 days once formulated, so more than once weekly delivery of medications will be required for home infusion. Stability may vary with diluent, final concentration to be administered, infusion container type, and storage conditions (eg, refrigerated vs room temperature). The pH and osmolality of solutions prepared for IV administration directly affect tolerability and may influence the type of vascular access device (VAD) needed.

Drugs are prepared and supplied to the patient/caregiver in a variety of delivery devices suitable for administering antimicrobials in the outpatient setting. Each method has advantages and disadvantages but should be selected based upon patient preferences and capabilities, drug characteristics (concentration/solubility, stability, infusion time), VAD, and cost/insurance coverage. Intravenous push is a rapid and convenient delivery method for many cephalosporins but may need a dexterity beyond some patients' or caregivers' comfort level or physical ability. Electronic infusion devices can be programmed to improve ease of use by automatically delivering multiple doses per day but they require the patient to be connected to a small device virtually continuously and are not covered by all payers. Elastomeric devices are very simple to use but may not be reimbursed by all insurance carriers. Gravity delivery is the simplest to use and least expensive but is less convenient than other methods due to longer infusion times.

The Role of the Physician and the OPAT Team

Regardless of the OPAT model chosen, it is the responsibility of the treating physician to manage and direct the patient's care. The treating physician addresses the indication for OPAT, selection of antimicrobial agent, duration of therapy, and subsequent medical evaluations. In the modern healthcare system, however, the physician does not work alone. He or she is supported by vascular access teams, social workers, nurses, and pharmacists, all working in collaboration to support the patient. Recognition of the contributions of multiple healthcare professionals and roles has led to the proposal of an OPAT bundle, which identifies several components that require attention when planning an OPAT program [37].

Emerging Trends in OPAT

The role of remote-access delivery of OPAT oversight is currently under investigation [38]. The use of telemedicine to support OPAT in geographically isolated locations is appealing but challenged in the United States by reimbursement models and interstate regulatory requirements. Also unknown, but promising, are the roles of the long-acting semisynthetic lipoglycopeptides