Antimicrobial therapy is changing constantly. This issue of *Medical Clinics of North America* summarizes the state of the art in antimicrobial therapy for clinicians. New concepts of antibiotic use have evolved during the past decade, determined by economic considerations. Previously, antibiotics were selected because of their high degree of in vitro activity, but at the present time antibiotic use is based on the least expensive antibiotic that is effective in a given clinical situation.

Important new concepts covered in this volume of general principles of antibiotic use include topics on antibiotic selection and pharmacokinetics. Clinicians should appreciate the difference between time-dependent killing kinetics versus concentration-dependent killing kinetics. These concepts have important ramifications on how antibiotics should be dosed. Single-dose aminoglycoside therapy and constant-infusion β-lactam therapy are examples of applying pharmacokinetic principles to the clinical situation. Tissue penetration remains an important consideration in infectious disease in general, and in surgical prophylaxis in particular. Single-dose, well timed, preoperative antibiotic prophylaxis for clean surgical procedures finally has come of age. Single-dose, preoperative prophylaxis with an effective antibiotic not only provides optimal effectiveness, but results in significant cost savings to the institution while minimizing resistance potential and adverse side effects.

Perhaps the most profound change in antibiotic therapy, conceptually, has been "switch" therapy from intravenous to oral antibiotic therapy. Intravenous to oral "switch" therapy based on pharmacokinetic principles is cost effective to the institution and well accepted by patients. The treatment of infectious diseases should not be viewed as requiring intravenous or oral antibiotics, but rather should be viewed from the perspective of effective antibiotic therapy regardless of the mode of antibiotic administration. Except for β-lactam antibiotics, the majority of antibiotics have comparable pharmacokinetics in serum and tissue when given by the intravenous or oral route (e.g., doxycycline, minocycline, TMP-SMX, chloramphenicol, clindamycin, azithromycin, quinolones, etc). Therefore, if clinically possible after 72 hours of initial intravenous therapy, the patient should be changed to equivalent coverage with oral antibiotics. The changeover
to an oral equivalent antibiotics may be delayed if there has not been clinical improvement or if the patient cannot tolerate oral medications. If patients can be treated earlier with oral antibiotics that are as equally effective as their intravenous equivalents, then hospital length of stay may be diminished at tremendous cost savings to the institution. Home intravenous therapy programs for infectious diseases are diminishing rapidly with so many potent oral antibiotics available that are equivalent to their intravenous counterparts.

Several infectious disease therapeutic problems also are discussed in this issue. The topics selected are those with which most clinicians have difficulty, and are discussed from a clinical perspective. The therapeutic approach to patients with sepsis remains unchanged despite economic pressure to introduce antimediator therapies. Antibiotics remain the cornerstone of treatment for the septic patient. At the present time, antimediator therapies are a dismal failure, have no role in the management of septic patients, and are unlikely to have any future role. The concluding article in this issue discusses antibiotic failure, which is an important problem faced by clinicians. The articles and approaches included in this issue are authored by internationally known and respected authorities in infectious diseases and should be of value to all clinicians using antimicrobial therapy.

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