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**A Study of Optimization of Pharmacokinetics in End Stage Renal
Disease Patients**

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ABSTRACT

Optimization of pharmacokinetics in end stage renal disease (ESRD) patients is an important aspect of clinical pharmacology and patient care because impaired kidney function significantly alters the absorption, distribution, metabolism, and excretion of many drugs. In patients with End-Stage Renal Disease, the kidneys lose their ability to effectively eliminate metabolic waste and medications, leading to the accumulation of drugs or their metabolites in the body. This accumulation may increase the risk of drug toxicity and adverse reactions. Therefore, careful optimization of pharmacokinetics is essential to ensure safe and effective drug therapy. Strategies for optimization include adjusting drug dosage, modifying dosing intervals, and selecting medications that are less dependent on renal elimination. Clinical parameters such as glomerular filtration rate (GFR), creatinine clearance, and the patient's dialysis status are often considered while determining appropriate dosing regimens. In addition, therapeutic drug monitoring and individualized treatment plans help clinicians maintain optimal drug concentrations within the therapeutic range. Pharmacokinetic modeling and modern computational tools also support personalized medication management for ESRD patients. By applying these strategies, healthcare professionals can minimize adverse drug reactions, improve therapeutic outcomes, and enhance the overall quality of life for patients suffering from severe kidney dysfunction.