

Review Article: Pathways to Precision: Advancing the Understanding of Drug Administration Methods

Miss. Pawar Sneha R. and Prof. Waghmare. S. U.

Student, Rashtriya College of Pharmacy, Hatnoor, Kannad, Sambhajinagar, Maharashtra, India

Abstract: *This review explores various routes of drug administration, discussing their advantages, limitations, and applications. It emphasizes the importance of choosing the appropriate route based on pharmacokinetics, patient condition, and the nature of the drug, aiming to provide an in-depth understanding of the current landscape in drug delivery. The route of drug administration plays a pivotal role in determining the efficacy, onset, and overall therapeutic outcome of medications. This review comprehensively explores the diverse pathways through which drugs are introduced into the human body, highlighting their mechanisms, advantages, limitations, and applications. Broadly categorized into enteral, parenteral, and topical routes, each method is tailored to specific clinical needs based on factors such as the physicochemical properties of the drug, patient condition, and desired therapeutic goals. Innovations in drug delivery, including transdermal systems, inhalation devices, and targeted delivery techniques, have further expanded the scope of administration, enhancing precision and minimizing adverse effects. The review also emphasizes the importance of patient compliance, bioavailability considerations, and the impact of administration routes on pharmacokinetics and pharmacodynamics. By delving into traditional methods such as oral and intravenous routes alongside emerging technologies like nanocarriers and implantable devices, this paper aims to provide a holistic understanding of drug administration. The insights presented herein offer valuable perspectives for clinicians, researchers, and pharmaceutical developers, fostering advancements in drug delivery systems to optimize therapeutic outcomes and improve patient care.*

Keywords: Intranasal administration, Drug delivery, intravitreal injection, ocular drug delivery, nanoparticle, implant, hydrogel, ICA, Sex difference, Intra-arterial injection, Rodent