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Journal of Biomedical Engineering and Medical Devices

Editorial

Drug Delivery and Therapeutics: An Overview

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EDITORIAL

Approaches, formulations, production processes, storage structures, and technology used to move a pharmaceutical substance to its target site in order to achieve a desired therapeutic effect are referred to as drug delivery. To maximize effectiveness and safety, as well as improve patient comfort and compliance, principles relating to drug preparation, route of administration, site-specific targeting, metabolism, and toxicity are used. Drug delivery aims to change a drug's pharmacokinetics and specificity by using various excipients, drug carriers, and medical devices throughout its formulation. To boost clinical outcomes, more focus is placed on increasing a drug's bioavailability and period of action. Some studies have focused on enhancing the protection of the individual who administers the drug. To minimize the risk of needlestick injury, many forms of microneedle patches have been developed for administering vaccines and other medications. Drug delivery is a term that is closely linked to dosage type and route of administration, with the latter being included in some definitions. [nine] Although the terms route of administration and drug delivery are often used interchangeably, they are two distinct concepts. Drug delivery involves the engineering of delivery systems which may involve various dosage types and devices used to deliver a drug along the same route, while route of administration refers to the path a drug takes to reach the body. Oral, parenteral (injected), sublingual, topical, transdermal, inhaled, rectal, and vaginal are common routes of administration; however, drug distribution is not limited to these routes, and there may be many ways to administer drugs via each route. Research into new delivery mechanisms has been advancing since the approval of the first controlled-release formulation in the 1950s, while new drug production has been declining. This change in emphasis may be due to a number of factors. The high cost of producing new drugs is one of the driving forces. According to a 2013 study, the cost of creating a distribution method is just 10% that of developing a new pharmaceutical. A more recent report estimated that the median cost of bringing a new drug to market in 2020 would be $985 million, but it did not include the cost of improving drug delivery systems. Other factors that may have affected the rise in drug delivery system growth include an improved understanding of the pharmacology, pharmacokinetics, and pharmacodynamics of many medications, as well as the rising prevalence of both chronic and infectious diseases. Targeted drug distribution, also known as smart drug delivery, is a method of administering medication to a patient in such a way that the medication concentration in certain areas of the body is higher than in others. This method of delivery is based in large part on nanomedicine, which intends to use nanoparticle-mediated drug delivery to combat the drawbacks of traditional drug delivery. These nanoparticles will be drug-loaded and targeted to particular areas of the body with only diseased tissue, preventing contact with healthy tissue. A targeted drug delivery system's purpose is to prolong, localize, target, and provide a drug interaction with diseased tissue that is safe.

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Received: April 09, 2021, **Accepted:** April 16, 2021, **Published:** March 23, 2021

Citation: Mallick K (2021) Drug Delivery and Therapeutics: An Overview. J Biomed Eng & Med Dev. 6:158.