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# Drug Repurposing: An Emerging Tool for Drug Reuse, Recycling and Discovery

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PMID: 33573567 DOI: [10.2174/2589977513666210211163711](https://doi.org/10.2174/2589977513666210211163711)

## Abstract

Drug repositioning or repurposing is a revolutionary breakthrough in drug development that focuses on rediscovering new uses for old therapeutic agents. Drug repositioning can be defined more precisely as the process of exploring new indications for an already approved drug while drug repurposing includes overall re-development approaches grounded in the identical chemical structure of the active drug moiety as in the original product. The repositioning approach accelerates the drug development process, curtails the cost and risk inherent to drug development. The strategy focuses on the polypharmacology of drugs to unlock novel opportunities for logically designing more efficient therapeutic agents for unmet medical disorders. Drug repositioning also expresses certain regulatory challenges that hamper its further utilization. The review outlines the eminent role of drug repositioning in new drug discovery, methods to predict the molecular targets of a drug molecule, advantages that the strategy offers to the pharmaceutical industries, explaining how the industrial collaborations with academics can assist in the discovering more repositioning opportunities. The focus of the review is to highlight the latest applications of drug repositioning in various disorders. The review also includes a comparison of old and new therapeutic uses of repurposed drugs, with the assessment of their novel mechanisms of action and pharmacological effects in the management of various disorders. Various restrictions and challenges that repurposed drugs come across during their development and regulatory phases are also highlighted.

**Keywords:** Drug reprofiling; drug repositioning; drug rescue; drug target; polypharmacology; retargeting; serological biomarkers; therapeutic switching.