

Orodispersible Tablets in Modern Pharmaceutical Sciences: An Insight into Preparation and Clinical Applications

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Abstract: Orodispersible Tablets (ODTs) represent a significant advancement in oral drug delivery systems, offering rapid disintegration in the oral cavity without the need for water. This feature makes ODTs particularly suitable for pediatric, geriatric, and dysphagic patients who often experience difficulty swallowing conventional dosage forms. The evolution of ODT technology has been driven by the growing demand for patient-centric drug delivery systems that enhance compliance, offer convenience, and provide faster onset of action. ODTs are formulated using a variety of techniques including direct compression, lyophilization, sublimation, and spray drying, utilizing excipients such as superdisintegrants, flavoring agents, and stabilizers to improve performance. Regulatory authorities such as the FDA and EMA have provided specific guidelines for their evaluation, ensuring product quality, safety, and efficacy. Recent innovations in nanotechnology, 3D printing, and personalized medicine have expanded the possibilities for ODT design and application, allowing for controlled drug release and precision dosing. Despite challenges such as taste masking, mechanical strength, and moisture sensitivity, ODTs continue to gain popularity in clinical use across therapeutic areas such as pain management, psychiatric care, and emergency treatment. This review highlights the formulation strategies, evaluation techniques, clinical applications, and future directions of ODTs, aiming to provide a comprehensive overview for researchers and formulators in pharmaceutical sciences.

Keywords: Orodispersible tablets, fast disintegration, pediatric drug delivery, superdisintegrants, nanotechnology, 3D printing, patient compliance

