

Literature Review of Fast Dissolving Tablets: Technologies, Formulation Strategies, and Clinical Relevance

Quick Answer:

Fast dissolving tablets (FDTs) are oral dosage forms designed to disintegrate rapidly in the mouth without water, improving patient compliance and bioavailability.

Literature shows that superdisintegrants, advanced manufacturing techniques, and optimized excipient selection are key to performance.

They are widely used in pediatrics, geriatrics, and emergency treatments.

Main challenges include mechanical strength, taste masking, and stability.

Recent studies focus on nanotechnology, 3D printing, and improved drug delivery efficiency.

FDTs represent a growing pharmaceutical innovation with strong clinical and commercial potential.

Introduction

Fast dissolving tablets (FDTs), also referred to as orally disintegrating tablets (ODTs), have gained significant attention in pharmaceutical research due to their unique ability to dissolve or disintegrate rapidly in the oral cavity without the need for water. Over the past two decades, the literature surrounding FDTs has expanded dramatically, reflecting increasing interest from both academia and industry. These dosage forms are especially valuable for populations such as pediatric, geriatric, and psychiatric patients who may have difficulty swallowing conventional tablets.

The evolution of FDTs has been driven by the need to improve patient compliance, enhance therapeutic effectiveness, and enable rapid onset of action. Early studies focused on simple formulations using disintegrants, while more recent research explores advanced techniques such as freeze-drying, sublimation, spray drying, and direct compression with engineered excipients. The literature also emphasizes the importance of taste masking, as the rapid dissolution of drugs in the mouth can expose patients to unpleasant flavors.

From a pharmacokinetic perspective, FDTs may offer improved bioavailability for certain drugs due to pre-gastric absorption. Researchers have investigated how formulation variables influence dissolution rate, absorption, and overall drug performance. At the same time, challenges such as mechanical fragility, moisture sensitivity, and manufacturing costs remain critical areas of study.

This comprehensive literature review synthesizes key findings from existing research on fast dissolving tablets. It covers formulation strategies, evaluation methods, advantages and limitations, and emerging technologies. The goal is to provide a structured and practical understanding of how FDTs work, what factors influence their performance, and what future directions are shaping this field.

SERP Analysis of Existing Content

A review of top-ranking articles on fast dissolving tablets reveals several consistent patterns in structure and content. Most high-performing pages adopt an academic or semi-academic format, combining theoretical explanations with practical insights.

Common Subheadings

- Introduction to Fast Dissolving Tablets
- Advantages and Disadvantages
- Formulation Techniques
- Superdisintegrants
- Evaluation Parameters
- Applications in Drug Delivery

Common Questions Covered

- What are fast dissolving tablets?
- How are they manufactured?
- What are their benefits over conventional tablets?
- Which drugs are suitable for FDTs?
- What challenges exist in formulation?

Content Format

Most content follows a hybrid structure combining a guide and a literature review. Some pages focus heavily on academic citations, while others provide simplified explanations for students and practitioners.

Content Gaps

- Lack of real-world formulation decision-making insights
- Limited discussion of trade-offs in excipient selection
- Insufficient explanation of manufacturing constraints
- Minimal focus on practical mistakes and failures

SEO Structure and Keyword Clustering

Primary Keyword

literature review of fast dissolving tablets

Secondary Keywords

- fast dissolving tablets formulation
- orally disintegrating tablets review
- FDT advantages and disadvantages
- superdisintegrants in tablets
- drug delivery systems FDT

Overview of Fast Dissolving Tablets

Fast dissolving tablets are solid dosage forms designed to disintegrate rapidly, typically within seconds, when placed on the tongue. The literature consistently defines FDTs based on their disintegration time, which usually ranges from 10 to 60 seconds depending on formulation and testing conditions.

The primary goal of FDTs is to enhance patient convenience while maintaining or improving therapeutic efficacy. Unlike traditional tablets, they do not require water, making them ideal for on-the-go use or situations where water is unavailable.

Formulation Strategies

Role of Superdisintegrants

Superdisintegrants are critical components in FDT formulations. They facilitate rapid tablet breakup through mechanisms such as swelling, wicking, and deformation recovery. Commonly studied superdisintegrants include croscopolidone, croscarmellose sodium, and sodium starch glycolate.

Manufacturing Techniques

- **Direct Compression:** Simple and cost-effective method using optimized excipients.
- **Freeze Drying:** Produces highly porous tablets but increases cost and fragility.
- **Sublimation:** Creates porous structures by removing volatile components.
- **Spray Drying:** Improves dissolution and uniformity.

REAL VALUE BLOCK: How Fast Dissolving Tablets Actually Work

At a functional level, fast dissolving tablets rely on rapid water penetration into the tablet matrix. When saliva contacts the tablet, capillary action draws moisture into the structure. Superdisintegrants then expand or deform, breaking the tablet apart.

The most important factors influencing performance are:

- **Porosity:** Higher porosity allows faster fluid penetration.
- **Disintegrant efficiency:** Determines how quickly the tablet breaks apart.
- **Drug solubility:** Affects dissolution after disintegration.
- **Mechanical strength:** Must balance durability with rapid disintegration.

Common mistakes in formulation include over-compression (reducing porosity), poor taste masking, and ignoring moisture sensitivity. Many formulations fail because they optimize one factor while neglecting others.

What actually matters most is balance. A successful FDT is not the fastest dissolving one, but the one that maintains stability, palatability, and consistent drug release under real-world conditions.

Advantages and Limitations

Advantages

- Improved patient compliance
- No need for water

- Rapid onset of action
- Enhanced bioavailability (in some cases)

Limitations

- Mechanical fragility
- Moisture sensitivity
- Taste masking challenges
- Higher manufacturing costs

What Other Reviews Don't Tell You

Most literature reviews focus heavily on theoretical advantages, but practical challenges are often underestimated. For example, scaling a formulation from lab to industrial production introduces issues like uniformity, equipment limitations, and regulatory compliance.

Another overlooked aspect is patient perception. Even if a tablet dissolves quickly, a bad taste or unpleasant mouthfeel can significantly reduce acceptance. Additionally, packaging plays a critical role—poor packaging can lead to moisture exposure and product failure.

Practical Tips for Researchers and Students

- Start with direct compression before exploring complex techniques
- Test multiple superdisintegrants in combination
- Focus on taste masking early in development
- Evaluate tablets under realistic humidity conditions
- Balance speed of disintegration with tablet strength

Buyer Guide: Writing and Research Support for Literature Reviews

Conducting a high-quality literature review on fast dissolving tablets requires more than just collecting sources. It demands structured thinking, critical analysis, and the ability to synthesize complex information into a coherent narrative. Many students and researchers struggle with organizing large volumes of data, identifying research gaps, and maintaining academic rigor.

One of the key challenges is filtering relevant studies from a vast pool of publications. Not all research is equally valuable, and distinguishing between high-quality and low-impact studies requires experience. Additionally, integrating findings into a logical structure often proves difficult, especially when dealing with conflicting results.

Another important factor is time management. Literature reviews are time-intensive, and balancing them with other academic or professional responsibilities can be overwhelming. This is where structured assistance can make a significant difference.

When seeking help, it is important to focus on clarity, depth, and originality. A well-written literature review should not only summarize existing research but also provide critical insights and identify future directions.

Need help structuring or writing your literature review?

If you're working on a complex topic like fast dissolving tablets and want expert-level assistance, you can request personalized academic support here:

[Get a custom quote for your literature review](#)

This can help you save time, improve quality, and ensure your work meets academic standards without unnecessary stress.

FAQ

1. What are fast dissolving tablets and how do they differ from conventional tablets?

Fast dissolving tablets are oral dosage forms that disintegrate quickly in the mouth without the need for water. Unlike conventional tablets, which require swallowing and subsequent dissolution in the gastrointestinal tract, FDTs begin breaking down immediately upon contact with saliva. This allows for faster drug release and, in some cases, quicker absorption.

The key difference lies in their formulation. FDTs use specialized excipients such as superdisintegrants and porous matrices to enable rapid disintegration. Conventional tablets, on the other hand, are designed for slower breakdown and controlled release.

2. What are the main challenges in developing fast dissolving tablets?

Developing FDTs involves balancing multiple competing factors. One major challenge is achieving rapid disintegration while maintaining sufficient mechanical strength. Tablets that dissolve too quickly may become fragile and difficult to handle.

Taste masking is another critical issue. Since the drug is released in the mouth, any unpleasant taste becomes immediately noticeable. Additionally, moisture sensitivity can lead to stability problems, requiring specialized packaging solutions.

3. Which drugs are most suitable for fast dissolving tablet formulations?

Drugs that are suitable for FDT formulations typically have low dose requirements, good solubility, and acceptable taste profiles. Highly bitter drugs or those requiring large doses may present challenges in formulation.

FDTs are commonly used for conditions requiring rapid relief, such as pain, allergies, and nausea. However, their applicability depends on both pharmacokinetic properties and formulation feasibility.

4. How are fast dissolving tablets evaluated in research?

Evaluation of FDTs involves multiple parameters, including disintegration time, dissolution rate, hardness, friability, and stability. Disintegration time is particularly important, as it directly affects patient experience.

Researchers also conduct taste evaluation, moisture uptake studies, and in vitro dissolution testing to ensure consistent performance. Advanced studies may include bioavailability assessments and clinical trials.

5. What future trends are shaping research on fast dissolving tablets?

Recent research is focusing on advanced technologies such as 3D printing, nanotechnology, and novel excipient development. These innovations aim to improve precision, efficiency, and scalability.

There is also growing interest in personalized medicine, where FDTs can be tailored to individual patient needs. This could revolutionize drug delivery by enabling customized dosing and improved therapeutic outcomes.

6. Why is taste masking so important in FDTs?

Taste masking is crucial because FDTs dissolve directly in the mouth, exposing taste receptors to the active drug. If the taste is unpleasant, patients may refuse to take the medication, reducing compliance.

Various techniques are used to mask taste, including coating, complexation, and the use of flavoring agents. However, achieving effective taste masking without affecting drug release remains a significant challenge.

7. How can students improve their literature review on this topic?

Students can improve their literature reviews by focusing on structure, critical analysis, and clarity. Instead of simply summarizing studies, they should compare findings, identify gaps, and provide insights.

Using clear headings, logical flow, and concise language can significantly enhance readability. Additionally, seeking expert feedback or professional assistance can help refine the final output.