

FORMS OF DRUGS

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ARTICLE INFORMATION

ABSTRACT:

ARTICLE HISTORY:

Received: 29.04.2026

Revised: 30.04.2026

Accepted: 01.05.2026

KEYWORDS:

drug forms, dosage forms, tablets, capsules, injections, pharmacology, administration, bioavailability, medication, therapy.

Drug forms, also known as dosage forms, play a critical role in determining how medications are delivered to the body and how effectively they produce their therapeutic effects. The selection of an appropriate dosage form ensures accurate dosing, stability of the active substance, ease of administration, and improved patient compliance. Modern pharmacology offers a wide variety of drug forms designed for different routes of administration and clinical purposes. This article examines the classification of drug forms, their characteristics, methods of administration, and their significance in optimizing therapeutic outcomes.

Drug forms represent the physical and chemical presentation of a pharmaceutical substance intended for administration to patients. They are developed to ensure that the active ingredient is delivered to the site of action in a safe, effective, and controlled manner. The design of a dosage form is influenced by multiple factors, including the physicochemical properties of the drug, the desired rate of absorption, patient characteristics, and the intended route of administration.

One of the most common categories of drug forms is solid dosage forms. These include tablets, capsules, powders, and granules. Tablets are widely used due to their convenience, stability, and precise dosing. They can be further modified into various types such as coated tablets, chewable tablets, and sustained-release tablets, each designed to achieve specific

therapeutic goals. Capsules, on the other hand, consist of a gelatin shell that encloses the drug substance, allowing for easier swallowing and improved taste masking.

Liquid dosage forms are another important category and include solutions, suspensions, syrups, and emulsions. These forms are particularly useful for pediatric and geriatric patients who may have difficulty swallowing solid medications. Liquids allow for flexible dosing and faster absorption compared to solid forms, although they may have limitations in terms of stability and shelf life.

Parenteral dosage forms, commonly known as injections, are administered directly into the body through routes such as intravenous, intramuscular, or subcutaneous injection. These forms provide rapid onset of action and high bioavailability, as they bypass the gastrointestinal tract. They are especially important in emergency situations and for drugs that are poorly absorbed orally. However, they require strict sterility and professional administration.

Topical dosage forms are applied directly to the skin or mucous membranes and include creams, ointments, gels, and patches. These forms are used for localized treatment and minimize systemic side effects. Transdermal patches, in particular, allow for controlled and sustained drug release over an extended period, enhancing patient compliance and therapeutic consistency.

Inhalational dosage forms are used to deliver drugs directly to the respiratory system. These include aerosols, inhalers, and nebulizers. They are commonly used in the treatment of respiratory conditions such as asthma and chronic obstructive pulmonary disease. This route provides rapid drug action with minimal systemic exposure.

The choice of drug form is closely related to the route of administration, which significantly affects bioavailability—the proportion of the drug that reaches systemic circulation. Oral administration is the most common and convenient route but may be influenced by factors such as digestion and first-pass metabolism. In contrast, parenteral administration ensures maximum bioavailability but is less convenient and more invasive.

Drug forms also play a crucial role in patient adherence to treatment. Factors such as ease of use, taste, dosing frequency, and comfort can significantly influence whether patients follow prescribed regimens. For example, sustained-release formulations reduce the need for frequent dosing, thereby improving compliance.

Advances in pharmaceutical technology have led to the development of innovative drug delivery systems, including nanotechnology-based carriers, controlled-release systems, and

targeted delivery mechanisms. These innovations aim to enhance drug efficacy while minimizing side effects, representing a significant progression in modern pharmacology.

In conclusion, drug forms are a fundamental aspect of pharmaceutical science, directly impacting the safety, effectiveness, and usability of medications. The careful selection and design of dosage forms ensure optimal therapeutic outcomes and improved patient experience. As pharmaceutical research continues to evolve, the development of more advanced and patient-friendly drug forms will remain a key priority in healthcare.

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