

# PHARMACOKINETICS AND ITS BASICS AND DELIVERY OF DRUGS WAYS AND EFFECTS

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**Abstract:** *The article analyzes the pharmacokinetics and its main principles, routes of administration and effect of the drug, the pharmacological effect of the drug in the body, the mechanism of action, localization of action (place of action), types of effects*

**Keywords:** *Pharmacokinetics, pharmacological effect, drugs, metabolism, pharmacological effect, mechanism of action, localization of action*

Two main concepts are important in the study of the interaction of drugs and the organism: Pharmacokinetics - the delivery, absorption, distribution, accumulation, transformation of drugs in the body ( metabolism) and excretion from the body.

**Pharmacodynamics** - the pharmacological effect of a drug in the body, the mechanism of action, the localization of the effect (site of action), the types of action. Medicines can be delivered to the body in different ways. The benefits of drugs, in turn, depend on the route of administration.

There are two main types of medications used: enteral and parenteral.

**I. Enteral route** - a route of administration of drugs through the gastrointestinal tract, which is mainly sublingual (sub lingua), oral (per os), mountain settings include the intestinal tract (per rectum). Put it under your tongue. This method is mainly used for the use of drugs that are easily absorbed from the oral cavity. Because of the ease of application under the tongue and the rapid onset of action of the drug, the patient is often treated quickly important. This route of delivery is especially useful in some diseases of the cardiovascular system (ischemic heart disease, hypertension, etc.).

Nitrates include nitroglycerin and nitrosorbite. Orinitrolong is a thin film that is applied to the mucous membranes of the cheeks.

**Oral delivery** is a natural, convenient, and non-invasive procedure. Therefore, many forms of medication (tablets, dragees, liquids) are taken orally. However, this approach has several drawbacks. For example, the effects of a given drug may not be immediate and the amount in the blood may not be known. Because gastrointestinal absorption of drugs depends on various factors. In other words, when it is sent this way, the benefits of the drug are not as fast and as expected. In addition, some protein-containing drugs (insulin, adrenaline, penicillin, etc.) are broken down by gastrointestinal juices and are not effective enough. It is not used in the treatment of unconsciousness, infants, persistent vomiting, etc.

Some drugs have a local effect on the gastrointestinal mucosa, causing ulcers (acetylsalicylic acid, indomethacin, reserpine, etc.), destroying the normal intestinal microflora (dysbacteriosis), disrupting digestion, fungus. 'causes disease (candidiasis). In the treatment of patients with such drugs, measures are taken to prevent these complications (do not take the drug in the diet, antifungal drugs, vitamins are recommended, etc.).

**Rectal injection** - This is a soft medicine that is usually given in the form of suppositories. It is used when oral administration is not possible (persistent vomiting, unconsciousness, oral and gastric surgeries, etc.). The drug is well absorbed into the bloodstream through this route and has a good effect because it bypasses the liver. In some cases, topical medications (analgesics, antiemetics, etc.) are also used.

**II. Parenteral route** - This includes the administration of drugs other than gastrointestinal. These include injections, inhalations, and topical injections.

**Injections** are injections of liquid drugs that break the integrity of the skin or mucous membranes (injections). In this way, mainly in water, isotonic saline solution, and fat-soluble sterilized drugs are delivered. The following types of injections are known - between and under the skin or mucous membranes, between muscles, veins, arteries, spinal cord, abdomen, etc. Low-volume (0.1–0.2 ml) liquid drugs are often injected into the skin or mucous membranes, often for the purpose of studying

allergic reactions and other drugs (anti-rabies serum, fraxiparin, etc.) Under the skin and mucous membranes - usually up to 2 ml, it is recommended to warm the oily solution before administration. Because it makes it easier for them to be absorbed into the bloodstream. For this purpose, the drugs are injected into the outer surface of the shoulder.

**Intramuscular injection** - Sterilized drugs dissolved in water or fat can be injected up to 10 ml, mainly under the muscles of the outer and upper part of the buttocks. This is because the drugs are absorbed into the bloodstream and have a quicker effect. This is because the blood supply to the muscles and their movement (contraction) ensure the absorption process.

**Intravenous administration** - In this way, drugs that are dissolved in water and isotonic saline solution, clean, clear, without sediments, sterilized, apyrogenic (without fever-causing substances) are administered. Because of their rapid onset of action, they are very useful in providing emergency medical care to patients (numbness, acute heart failure, etc.). Another advantage of this method is that the drug solution can be infused in large volumes (300-500 ml). Intravenous administration of drugs is carried out by doctors and specially trained performed by experienced nurses.

Arterial delivery is rarely used in practice. It is mainly used in oncology and endocrinology when it is difficult to find and get into the veins. This route is used by specialist doctors (surgeons, etc.). Spinal cord transplantation - Commonly used in anesthesiology and neurosurgery. For this purpose, mainly analgesics (novocaine, etc.) are used, and this is done only by specialists (anesthesiologists, neurosurgeons, etc.)

Intra-abdominal administration of drugs is mainly used in experimental pharmacology to determine the biological activity of the substance under investigation (acute toxicity, etc.), to prevent or treat purulent complications after surgery in the abdominal cavity, mainly, antimicrobial drugs (antibiotics) are sent.

In addition to the types of injections mentioned above, there are other types of injections into the bones, joints. Injection molding is widely used in medical practice,

especially in emergency care. Because the exact dose of the drug is absorbed into the bloodstream, the effect is immediate. In addition to the sterilized, clean, clear, sediment-free and isotonic drug for injection, the sterilized syringe, needle, infusion system must be delivered by specialists under aseptic conditions. Otherwise, the injection can lead to a number of complications and side effects. The most dangerous of the complications are viral infections (AIDS, hepatitis). In addition, purulent diseases (abscess, phlegmon) may also develop. The use of disposable syringes to avoid these dangerous complications has become commonplace. Inhalation is the inhalation of a drug. In this way, volatile liquids, vapors, gases and powdered drugs are delivered. In anesthesiology, the delivery of anesthetics (ether, fluorothane, nitric oxide, etc.), and in pulmonology, the delivery of aerosols is performed by patients and specialists using special devices using inhalers. Topical application - Topical medications include various solutions, ointments, powders, plasters, and more. They are applied to the skin, washed, and the cavities are rinsed. Or eyes, ears, nose. For this purpose, more antiseptic (antimicrobial) drugs (antibiotics, sulfonamides, nitrofurans, iodine, diamond green, ethyl alcohol, potassium permanganate, etc.) are given. In other words, the local effects of these drugs are used in diseases of the skin, mucous membranes, eyes, nose and ears. It should be borne in mind that some of these drugs can have a general resorptive effect, not only local action, but also absorbed into the blood.

Drugs cross the biological membrane - Once a drug is injected into the body, it encounters various obstacles until it reaches its destination and manifests itself. One of these is the membranes of cells. The passage of drugs through these membranes depends on a number of factors - the chemical structure and properties of the drug, the pH (concentration of hydrogen ions) and other factors.

The number and movement of the cell layer can also affect the passage of the drug through the membrane, slowing or accelerating it. From a practical point of view, the following biological barriers are of great importance: gastrointestinal mucosa, skin, hemato-encephalic barrier (vascular barrier impermeable to brain tissue), placental barrier (barrier separating blood circulation in the fetus with

maternal blood circulation), mammary gland epithelium, renal barrier. Lipotropic drugs are derived from biological membranes it goes well

Non-polar drugs have high levels of lipotropic properties. Most drugs are weakly acidic or alkaline and can only be partially polarized depending on the pH.

Non-polar drugs are highly soluble in water and poorly soluble in oils, making them virtually impermeable to biological membranes. The degree of ionization and the difference in pH on both sides of the membrane play a role in the passage of drugs through the membrane. Take, for example, the biological membrane of epithelial cells in the gastric mucosa, which has a high acidity due to hydrochloric acid on the outside (stomach cavity) and a neutral pH on the inside (7.4). For this reason, alkaline drugs (theophylline, ephedrine, reserpine, and other alkaloids) become polarized and cannot be absorbed into the bloodstream through the gastric mucosa.

These drugs pass into the duodenum and small intestine after being absorbed in the stomach. Here, as the pH is close to neutral, their polarity is greatly reduced, they become non-polar, are absorbed through the cell membrane, and exert their effects.

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