

Health
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Metabolism and medicine

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It is a substance that affects the function of living cells, used in medicine to diagnose, cure, prevent the occurrence of diseases, disorders and prolong the life of patients with incurable conditions. Since 1900 the availability of new drugs, the average life span has increased from 60 years to 75 years. Drugs have contributed to the eradication of once widespread and sometimes fatal diseases such as poliomyelitis and smallpox.

Classification:

Drugs can be classified in many ways: by the way they are dispensed – over the counter or by prescription; by the substance from which they are derived – plant, mineral, or animal; by the form they take – capsule, liquid, or gas; and by the way they are administered – by mouth, injection, inhalation, or direct application to the skin (absorption). Drugs are also classified by their names. All drugs have three names: a chemical name, which describes the exact structure of the drug; a generic or proprietary name, which is the official medical name assigned by the US Adopted Name Council (a group composed of pharmacists and other scientists); and a brand or trade name given by the particular manufacturer that sells the drug. If a company holds the patent on a drug – that is, if the company has the exclusive right to make and sell a drug, then the drug is available under one brand and name only. Another way to categorise drugs is by the way they act against diseases or disorders: chemotherapeutic drugs attack specific organisms that cause a disease without harming the host, while pharmacodynamic drugs alter the function of bodily systems by stimulating or depressing normal cell activity in a given system. The most common way to categorise a drug is by its effect on a particular area of the body or a particular condition.

How drugs move through the body:

The effects of a drug on the body depends on a number of processes that the drug undergoes as it moves through the body. All these processes together are known as pharmacokinetics (motion of the drug). First in these processes is the administration of the drug, after which it must be absorbed into the bloodstream. From the bloodstream, the drug is distributed throughout the body to various tissues and organs. As the drug is metabolised, or

broken down and used by the body, it goes through chemical changes that produce metabolites or altered forms of the drug, most of which have no effect on the body. Finally, the drug and its metabolites are eliminated from the body.

Administration:

Depending on the drug and its desired effect, there are a variety of administration methods. Most drugs are administered orally, through the mouth. Only the drugs which will not be destroyed by the digestive processes of the stomach or intestines can be given orally. Drugs can also be administered by injection into a vein (intravenously), which assures quick distribution through the bloodstream and a rapid effect; under the skin (subcutaneously) into the

tissues, which results in localised action at a particular site as with local anesthetics; or into a muscle (intramuscularly), which enables rapid absorption through the blood vessels found in muscles. An intramuscular injection may also be given as a depot preparation, in which the drug is combined with other substances so that it is slowly released into the blood. Inhaled drugs are designed to act in the nose or lungs. General anesthetics may be given through inhalation. Some drugs are administered through drug-filled patches that stick to the skin. The drug is slowly released from the patch and enters the body through the skin. Drugs may be administered topically that is, applied directly to the skin; or rectally – absorbed through an enema (an injection of liquid into the

rectum) or a rectal suppository (a pellet of medication that melts when inserted in the rectum).

Absorption:

Absorption is the transfer of a drug from its site of administration to the bloodstream. Drugs that are inhaled or injected, enter the bloodstream more quickly than drugs taken orally. Oral drugs are absorbed by the stomach or small intestine and then passed through the liver before entering the bloodstream.

Distribution:

Distribution is the transport of a drug from the bloodstream to tissue sites where it will be effective, as well as to sites where the drug may be stored, metabolised, or eliminated from the body. Once a drug reaches its intended destination, the