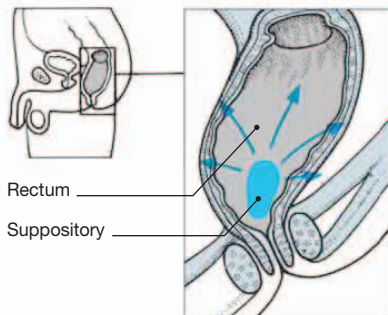


RECTAL ADMINISTRATION

Drugs intended to have a systemic effect may be given in the form of suppositories inserted into the rectum, from where they are absorbed into the bloodstream. This method may be used to give drugs that might be destroyed by the stomach's digestive juices. It is also sometimes used to administer drugs to people who cannot take medication by mouth, such as those who are suffering from nausea and vomiting.

Drugs may also be given rectally for local effect, either as suppositories (to relieve haemorrhoids) or as enemas (for ulcerative colitis).



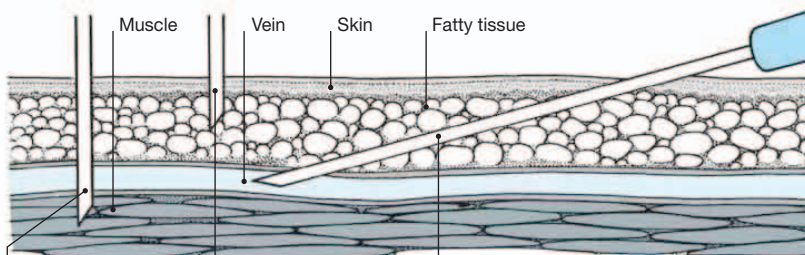
INHALATION

Drugs may be inhaled to produce a systemic effect or a direct local effect on the respiratory tract. Insufflation into the nose ("snorting") is a variation of this delivery method. Gases to produce general anaesthesia are administered by inhalation and are absorbed into the bloodstream through the lungs, producing a general effect on the body, particularly the brain. Bronchodilators (for certain types of emphysema, bronchitis, and asthma) are taken by inhalation for their direct effect on the respiratory tract, but some of the active drug also reaches the bloodstream. (See also p.48.)

ADMINISTRATION BY INJECTION

Drugs may be injected into the body to produce a systemic effect. One reason for injecting drugs is the rapid response that follows. Other circumstances that call for injection are when: a person is intolerant to the drug when taken by mouth; the drug would be destroyed by the stomach's digestive juices (insulin, for example); or the drug cannot pass through the intestinal walls into the bloodstream. Drug injections may also be given to produce a local effect, as is often done to relieve the pain of arthritis.

The three most common methods of injection – intramuscular, intravenous, and subcutaneous – are described in the illustration (see right). The type of injection depends both on the nature of the drug and the condition being treated.



Intramuscular (IM) injection

The drug is injected into a muscle, usually of the thigh, the upper arm, or the buttock.

Subcutaneous (SC) injection

The drug is injected directly under the surface of the skin.

Intravenous (IV) injection

The drug is injected directly into a vein and therefore directly into the bloodstream. Drugs given by this route act more quickly than drugs given by other types of injection.

TOPICAL APPLICATION

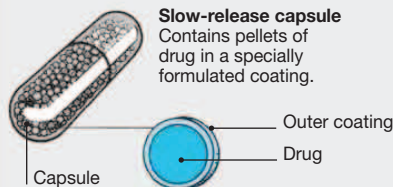
In treating localized disorders such as skin infections and nasal congestion, it is often preferable when a choice is available to prescribe drugs in a form that has a topical, or localized, rather than a systemic effect. The reason is that it is much easier to control the effects of drugs administered locally and to ensure that they produce the maximum benefit with minimum adverse effects.

Topical preparations are available in a variety of forms, from skin creams, gels, ointments, and lotions to nasal sprays, ear and eye drops, bladder irrigations, and vaginal pessaries. It is important when using topical preparations to follow instructions carefully, avoiding a higher dose than recommended or application for longer than necessary. This will help to avoid adverse systemic effects caused by the absorption of larger amounts into the bloodstream.

SLOW-RELEASE AND MODIFIED-RELEASE PREPARATIONS

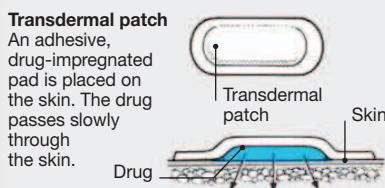
Some disorders can be treated with specially formulated preparations that can release the active drug slowly. Such preparations may be beneficial when it is inconvenient for a person to visit the doctor regularly, or when only small amounts of the drug need to be released into

the body. Slow release of drugs can be achieved by depot injections, transdermal patches, capsules and tablets, and implants. Modified-release tablets and capsules are a more advanced version in which release of the active ingredient is related to time.



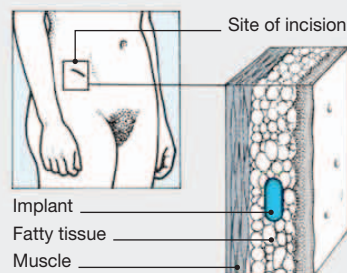
Slow-release capsule

Contains pellets of drug in a specially formulated coating.



Transdermal patch

An adhesive, drug-impregnated pad is placed on the skin. The drug passes slowly through the skin.



Implants

A pellet containing the drug is implanted under the skin. By this rarely used method, a drug (usually a hormone) is slowly released into the bloodstream over a period of months.