

ROUTE OF ADMINISTRATION	ABSORPTION PATTERN	ADVANTAGES	DISADVANTAGES
Oral	<ul style="list-style-type: none"> ● Variable; affected by many factors 	<ul style="list-style-type: none"> ● Safest and most common, convenient, and economical route of administration 	<ul style="list-style-type: none"> ● Limited absorption of some drugs ● Food may affect absorption ● Patient compliance is necessary ● Drugs may be metabolized before systemic absorption
Intravenous	<ul style="list-style-type: none"> ● Absorption not required 	<ul style="list-style-type: none"> ● Can have immediate effects ● Ideal if dosed in large volumes ● Suitable for irritating substances and complex mixtures ● Valuable in emergency situations ● Dosage titration permissible ● Ideal for high-molecular-weight proteins and peptide drugs 	<ul style="list-style-type: none"> ● Unsuitable for oily or poorly absorbed substances ● Bolus injection may result in adverse effects ● Most substances must be slowly injected ● Strict aseptic techniques needed
Subcutaneous	<ul style="list-style-type: none"> ● Depends on drug diluents: Aqueous solution: prompt Depot preparations: slow and sustained 	<ul style="list-style-type: none"> ● Suitable for slow-release drugs ● Ideal for some poorly soluble suspensions 	<ul style="list-style-type: none"> ● Pain or necrosis if drug is irritating ● Unsuitable for drugs administered in large volumes
Intramuscular	<ul style="list-style-type: none"> ● Depends on drug diluents: Aqueous solution: prompt Depot preparations: slow and sustained 	<ul style="list-style-type: none"> ● Suitable if drug volume is moderate ● Suitable for oily vehicles and certain irritating substances ● Preferable to intravenous if patient must self administer 	<ul style="list-style-type: none"> ● Affects certain lab tests (creatinine kinase) ● Can be painful ● Can cause intramuscular hemorrhage (precluded during anticoagulation therapy)
Transdermal (patch)	<ul style="list-style-type: none"> ● Slow and sustained 	<ul style="list-style-type: none"> ● Bypasses the first-pass effect ● Convenient and painless ● Ideal for drugs that are lipophilic, thus requiring prolonged administration ● Ideal for drugs that are quickly eliminated from the body 	<ul style="list-style-type: none"> ● Some patients are allergic to patches, which can cause irritation ● Drug must be highly lipophilic ● May cause delayed delivery of drug to pharmacological site of action ● Limited to drugs that can be taken in small daily doses
Rectal	<ul style="list-style-type: none"> ● Erratic and variable 	<ul style="list-style-type: none"> ● Partially bypasses first-pass effect ● Bypasses destruction by stomach acid ● Ideal if drug causes vomiting ● Ideal in patients who are vomiting, or comatose 	<ul style="list-style-type: none"> ● Drugs may irritate the rectal mucosa ● Not a well-accepted route.
Inhalation	<ul style="list-style-type: none"> ● Systemic absorption may occur. This is not always desirable 	<ul style="list-style-type: none"> ● Absorption is rapid; can have immediate effects ● Ideal for gases ● Effective for patients with respiratory problems ● Dose can be titrated ● Localized effect to target lungs: lower doses used compared to that with oral or parental administration ● Fewer systemic side effects 	<ul style="list-style-type: none"> ● Most addictive route (drug can enter the brain quickly) ● Patient may have difficulty regulating dose ● Some patients may have difficulty using inhalers
Sublingual	<ul style="list-style-type: none"> ● Depends on the drug: Few drugs (for example, <i>nitroglycerin</i>) have rapid, direct systemic absorption Most drugs erratically or incompletely absorbed 	<ul style="list-style-type: none"> ● Bypasses first-pass effect ● Bypasses destruction by stomach acid ● Drug stability maintained because the pH of saliva relatively neutral ● May cause immediate pharmacological effects 	<ul style="list-style-type: none"> ● Limited to certain types of drugs ● Limited to drugs that can be taken in small doses ● May lose part of the drug dose if swallowed

Figure 1.5

The absorption pattern, advantages, and disadvantages of the most common routes of administration.