

PARENTERAL ROUTE OF ADMINISTRATION

A drug given parenterally is one given by a route other than the mouth.

The three main parenteral routes of drug administration are IV, IM, and SC, and in all cases administration is usually via a hollow needle.

Parenteral dosage forms include aqueous, organic, aqueous/organic, and oily solutions, emulsions, suspensions,

Parenteral preparations must be sterile and pyrogen-free; they should, if possible, be buffered close to physiological pH and preferably be isotonic with the body fluids.

Volumes delivered can range from milliliter to liter quantities.

The advantages a parenteral dosage form include:

- 1- *The time to onset* of action can be controlled by the type of formulation and by the site of injection.
- 2- To avoid nausea and vomiting due to local gastrointestinal irritation,
3. Many drugs are inactivated by acidic pH in the stomach, or metabolized by rumen or gastrointestinal enzymes or bacteria.
4. Onset of action is not only more rapid following parenteral administration, but blood concentrations are often more predictable because all of the drug is systemically available after I.V, I.M, S.C and I.D administration, particularly compared with oral administration.
5. Parenteral administration to an individual food-producing animal is much easier than oral administration of a dosage form that requires manual restraint and manipulation of the animal's head.

Disadvantages of a parenteral dosage form include:

- 1.The dosage form has to be administered by trained personnel and requires adherence to aseptic technique.
- 2.When a drug is administered parenterally (by injection), it cannot be removed from the body. ions can produce severe local irritation and tissue damage.
- 3.Parenteral administration may be time-consuming unless one of the automatic syringes.
- 4.Special care must be taken in packaging parenteral dosage forms.

A solution for injection

“Water for injection” is the most widely used solvent for parenteral formulations.

However, a non-aqueous solvent or a mixed aqueous/non-aqueous solvent system may be necessary to stabilize drugs that are readily hydrolyzed by water or to improve solubility.

A range of excipients may be included in parenteral solutions, including antioxidants, antimicrobial agents, buffers, chelating agents, inert gases, and substances to adjust tonicity.

A suspension for injection consists of insoluble solid particles dispersed in a liquid medium, with the solid particles accounting for 0.5%–30% of the suspension. The vehicle may be aqueous, oil, or both.

Injectable suspensions are frequently administered to large animals.

Excipients in injectable suspensions include antimicrobial preservatives, surfactants, dispersing or suspending agents, and buffers.

A dry powder for parenteral administration is reconstituted as a solution or as a suspension immediately before injection.

The principal advantage of this dosage form is that it overcomes the problem of instability in solution.

Proteins and other materials that are extremely heat sensitive cannot be dried in pharmaceutical driers. Rather, freeze-drying, or lyophilization, is used to produce a porous powder that reconstitutes readily.