

## Liquid Dosage Forms

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**Received:** July 25, 2016; **Accepted:** August 20, 2016; **Published:** August 24, 2016

### Abstract

Liquid state forms are meant for internal, parental or external use. They are available in monophasic and biphasic forms. Monophasic liquid dosage forms are true or colloidal solution. Water is mainly used as a solvent for majority of monophasic liquid dosage forms. The liquid which consists of two phases are known as biphasic liquids.

*Keywords: Liquid dosage forms, Suspensions, Emulsions, Ointments, Internal use, External use*

### Introduction

Liquid form of a dose of a drug used as a drug or medication intended for administration or consumption [1-15]. Advantages

- Faster absorption than solids
- Palatable pleasant to taste
- Best choice for children and old persons

**Monophasic liquid dosage forms:** It contains only one phase.

#### Classification [16-30]

**A. Liquids for internal use:** Drops, Elixirs, Linctus, Syrups, and draughts.

**B. Liquids for external use:**

**Liquid to be applied to the skin:** Liniments and lotions.

**Liquids meant for body cavity:** Gargles, throat paints, mouth washes, throat paints, mouth washes, eye drops, eye lotions, ear drops, nasal drops, sprays and inhalations

**Syrups:** Saturated solution of sucrose in purified water, sweet viscous preparations. Concentration of sugar is 66% (w/w). Syrups containing medicinal substances are called medicated syrups and those containing aromatic or flavored substances are known as flavored syrups.

**Preparation:** Add sucrose to purified water and heat it to dissolve sucrose with occasional stirring. Cool it and add more of purified water to make the required weight. Syrups used in formulation of antibiotics, saline drugs, vitamins, antitussives, sedatives [31-35].

**Elixirs:** Sweet aromatic colored preparations. Main Ingredients of elixir are ethyl alcohol, water, glycerin, propylene glycol, flavoring agent, syrup and preservatives. Medicated elixir contains very potent drug such as antibiotics, antihistamines, sedatives. Flavoring elixirs used as flavours and vehicles [36-38].

**Linctuses:** Viscous liquid and oral preparations that are generally prescribed for the relief of cough. They contain medicament which have demulcent, sedative or expectorant action. linctuses should be taken in a small doses sipped and swallowed slowly without diluting it with water in order to have maximum and prolonged effect of medications. Simple syrup is used a vehicle for most of the linctuses. Tolu syrup is preferred in certain cases because of its aromatic odour and flavor [39-41].

**Drops:** Liquid preparations meant for oral administration. The oil soluble vitamins such as vitamin A and D concentrations in fish liver oil are presented as drops for administration. Since these preparations contain potent medications the dose must be measured accurately [42-45].

**Liniments:** Liquid and semi liquid preparations meant for application to the skin. Liniments are usually applied to the skin with friction and rubbing of the skin. Liniments may be alcoholic or oily solutions or emulsions. Alcohol helps in penetration of medicament in to the skin and also increases its counterirritant or rubefacient action. Arachis oil is used in some liniments which spread more easily on the skin. Soap is also included as ingredients in some of the liniments which helps in easy application of liniment on the skin.

Liniments contain medicaments possessing analgesic, rubefacient, soothing, counter irritant or stimulating properties. Liniment should not be applied to broken skin it may cause excess irritation [46-48].

**Lotions:** Liquid preparations meant for external application without friction. They are applied direct to the skin with the help of some absorbent material such as cotton, wool or gauze soaked in it. Lotions may be used for local action as cooling, soothing or protective purpose. They are generally prescribed for antiseptic action ex: Calamine lotion [49-50].

**Gargles:** Aqueous solutions used to prevent or treat throat infections. They are usually available in concentrated form with direction for dilution with warm water before use. They are brought in to contact with mucous membrane of the throat and are allowed to remain in contact with it for a few seconds [51-53].

**Mouth washes:** Aqueous solutions with a pleasant taste and odour used to make clean and deodorize the buccal cavity. Generally they contain antibacterial agents, alcohol, glycerin, sweetening agents, flavouring agents and coloring agents [54-55].

**Throat paints:** Viscous liquid preparations used for mouth and throat infections. Glycerin is commonly used as a base it

adheres to mucous membrane for a long period and it possesses a sweet taste [56].

**Nasal drops;** solutions of drugs that are instilled in to the nose with a dropper. They are usually aqueous and not oily drops. Nasal drops should be isotonic having neutral pH and viscosity similar to nasal secretions by using methyl alcohol [57-60].

**Ear drops:** Sterile solution or suspensions of drugs that are instilled in to the eye with a dropper. The eye drops are usually made in aqueous vehicle. It should be sterile isotonic with lacrymal secretions, buffered and free from foreign particles to avoid irritation to the eye [61-64].

**Eye lotions:** Aqueous solutions used for washing the eyes. The eye lotions are supplied in concentrated form and are required to be diluted with warm water immediately before use. It should be isotonic and free from foreign particles to avoid irritation to the eye [65-70].

**Ear drops:** solutions of drugs that are instilled in to the ear with a dropper. These are generally used for cleaning the ear, softening the wax and for treating the mild infections [71-72].

**Biphasic liquid dosage forms:** It contains two phases [73-80].

Ex: Suspension and emulsion

**Suspensions:** Biphasic liquid dosage form of medicament in which finely divided solid particles are dispersed in a liquid or semisolid vehicle. The solid particles act as disperse phase whereas liquid vehicle acts as the continuous phase. Suspensions are generally taken orally or by parental route. They are also used for external application [81-85].

Many suspensions are supplied as dry powders which are converted in to suspensions by adding the specified amount of vehicle before use. This is done to ensure the stability of suspension

Ex: Ampicillin for oral suspensions, Barium sulphate suspensions, Insulin zinc suspension

**Emulsion:** Biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as minute globules in to the other. The liquid which is converted in to minute globules is called the disperse phase and the liquid in which the globules are dispersed is called the continuous phase. Normally two immiscible liquids cannot be dispersed for a long period. So an emulsifying agent is added to the system. It forms the film around the globules in order to scatter them indefinitely in the continuous phase, So that a stable emulsion is formed [86-90].

### **Emulsions are of two types [91-100]**

**I. Oil in water type (O/W):** Emulsion in which oil is I the dispersed phase whereas water is in the continuous phase. The O/W type emulsions are preferred for internal use. In these emulsions gum acacia, tragacanth, methyl cellulose, saponins synthetic substances and soaps formed from monovalent bases like sodium, potassium are used as an emulsifying agent.

**II. Water in oil type (W/O):** Emulsion in which water is in the dispersed phase whereas oil is in continuous phase. Wool

wax, resins, beeswax and soaps formed from divalent bases like calcium, magnesium and zinc are used as an emulsifying agent. The W/O emulsions are mainly used externally as lotions or creams.

**III. Intravenous emulsion:** The oil soluble hormones vitamin A,D and K are administered as intravenous injection. The emulsified oils are also injected as diagnostic aids. The emulsion should have small globule size and must be sterile.

**IV. Emulsion for external use:** The emulsions for external application may be both O/W or W/O type but O/W type emulsion is preferred. When a drug is emulsified its rate of penetration through the skin may get reduced. It helps to prolong the action of a drug. Generally the emulsions for application to the skin are semisolid at room temperature and are considered to be an excellent vehicle.

### **Conclusion:**

Liquid dosage forms are formulated to release the active principle immediately after oral administration to obtain rapid and complete systemic drug absorption when compared to oral route. Liquid state forms are meant for internal, parental or external use.

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