

# Weights and Measures

There are two systems of weights and measures (a) the imperial system (b) the metric system, with which the pharmacist must be familiar. The imperial system is an old system based on arbitrary and unrelated units e.g. grains, drachms, ounces and gallons whereas the metric system or decimal system is based on related and rationally derived units e.g. milligrams, grams, centimeters, meters, millilitres, litres etc. Because of its easier calculations, greater accuracy and flexibility and use in other sciences, now a days this is the most widely used system by official agencies.

At present still a large number of physicians trained to use the imperial system prescribe the drugs in the old system and some hospitals still retain it as the local standard. Some drugs are prescribed in fractional doses (1/200, 1/150, 1/100 gr.). The bottles for liquids are still manufactured to contain ounce measurements rather than milliliters.

Due to the above mentioned reasons, it is still necessary to be familiar with both the systems which are described in detail as follows:

## (a) Imperial System:

Imperial system is divided into two systems.

- (i) Avoirdupois system.
- (ii) Apothecaries system.

### Avoirdupois system:

According to this system the standard unit for weighing is pound and all other measures of mass are derived from pound. It is represented by lb.

- 1 lb = 16 oz (avoir)
- 1 lb = 7000 grains
- 1 oz =  $7000/16 = 437.5$  grains.

### Apothecaries System:

It is also known as troy system. The standard weight in this system is grain.

- 20 grain = 1 scruple
- 60 grain = 1 drachm
- 480 grain = 1 ounce (Apothe)
- 8 drachm = 1 ounce (Apothe)
- 12 ounces (Apothe) = 1 pound (Apothe)
- 5760 grain = 1 pound (Apothe)

### Abbreviations Commonly Used in Weighing

<i>Latin name</i>	<i>Symbol</i>	<i>English name</i>	<i>Equal to</i>
Gratum	gr	grain	1 grain
Scrupulus	♥	Scruple	20 grain
Drachma		drachm	60 grain

### EXERCISE No. 3

For :

Age :

Address :

R

Calcium carbonate	37.5 gm
Heavy magnesium carbonate	37.5 gm
Sodium bicarbonate	12.5 gm
Bismuth carbonate	12.5 gm

Make a powder.

**Label :** The Compound Bismuth Powder. Send 50 gm.

**Sig :** 5 gm bis in die sumenda.

**Type :** Bulk powder.

#### Procedure

Weigh accurately all the ingredients and mix them in the ascending order of their weights. Pack the mixed powder in wide mouthed container, label and dispense.

#### Uses

This preparation is used as an antacid.

**Marketed preparation by :**

Geoffrey Manners & Co. Ltd., Bombay-400038.

Bismag powder

Contains

Sodium bicarbonate, heavy magnesium carbonate, light magnesium carbonate, calcium carbonate.

## EXERCISE No. 7

**For:**

**Age:**

**Address:**

**R<sub>x</sub>**

Rhubarb, in powder	25.0 gm
Ginger, in powder	10.0 gm
Light magnesium carbonate	32.5 gm
Heavy magnesium carbonate	32.5 gm

Make powder.

**Label** : The Gregory's powder (Compound Rhubarb powder) Send 25 gm.

**Directions** : 0.5 to 5.0 gm to be taken twice in a day.

**Type** : Bulk oral powder.

### Theory

Since it is difficult to finely powder the vegetable drugs in a pestle and mortar on laboratory scale, therefore such powders are used which are already available in the powder form. Light magnesium carbonate is used because it disperses easily in the liquids. Heavy magnesium carbonate is used to avoid bulkiness of the preparation. Rhubarb powder acts as a laxative. Ginger powder imparts flavouring properties and prevent gripping action produced by rhubarb.

### Procedure

Weigh the calculated amount of rhubarb, in powder; ginger, in powder; light magnesium carbonate and heavy magnesium carbonate. Mix these powders in the ascending order of their weights. Transfer the mixed powders in suitable air tight containers, label and dispense.

### Uses

This powder is used as laxative.

## EXERCISE No. 10

For :

Age :

Address :

R<sub>x</sub>

Phenobarbitone sodium            15 mg

Send such 4 powders.

**Sig** : Unus omni nocte sumenda.

**Type** : Simple oral divided powder.

### Theory

Since there will be little wastage of powder during weighing, mixing and dividing the powder therefore calculate for one extra powder than required.

The quantity of Phenobarbitone sodium prescribed is very small and it is not possible to weigh such a small quantity on dispensing scale therefore 100 mg (minimum amount) of Phenobarbitone sodium will have to be weighed which will be diluted with lactose by means of trituration.

### Procedure

Weigh 100 mg of Phenobarbitone sodium and mix it with 900 mg of lactose by means of trituration = 1 gm total. Weigh out 150 mg of this mixture which will contain 15 mg of Phenobarbitone sodium. Prepare such four powders each weighing 150 mg of the triturate, discard the rest, wrap in powder papers, label and dispense.

### Uses

Phenobarbitone sodium is used as hypnotic, sedative and anticonvulsant.

## EXERCISE No. 12

For :

Age :

Address :

**R<sub>x</sub>**

Purified talc, sterilised	50 gm
Starch, in powder	25 gm
Zinc oxide	25 gm

**Label :** Zinc, Starch and Talc dusting powder. Send 50 gm.

**Type :** Dusting powder.

### Theory

This preparation contains talc which is a mineral ingredient and may be contaminated with spores of clostridium tetani and clostridium welchii (a source of tetanus). Therefore whenever talc and kaolin is to be used in dusting powders, must be sterilised by heating at 160 °C for one hour to remove these micro-organisms. Purified talc has excellent flow and lubricant properties therefore is used in a number of dusting powders. Starch acts as an absorbent. Zinc oxide acts as an antiseptic and absorbs moisture.

Boric acid should no longer be used in dusting powders since it has been found that it may be absorbed in large amounts through the open skin leading to toxic reactions.

### Procedure

Weigh the required quantities of purified talc, sterilised; starch, in powder and zinc oxide. Mix zinc oxide with starch, incorporate purified talc, sterilized. Mix thoroughly. Pass the mixed powders through a sieve no. 120 to remove gritty particles. After sifting, whole of the powder must again be lightly mixed. Pack the powder in sifertop containers to protect it from air, moisture and contamination as well as convenience of application:

### Uses

It is used as an antiseptic dusting powder.

**Marketed preparation by Alpine Industries, New Delhi-110028.**

**Talc dusting powder**

Each contains

Purified talc	900 gm
Starch	100 gm

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