

doses not in mind must be within ready access to the prescription case and dispensing counter. Never guess at a dose; if in doubt, look it up and see to it that reference books are always convenient for this purpose.

The word "dose" is a short combination of letters coming from the Greek word meaning "to give." In our minds and practice must be associated not only the idea of giving, but also that of the "amount" given. It is of this quantity that constitutes a dose and the conditions that increase or decrease the amount to be taken that I propose to speak.

From the dogmatic manner in which doses are stated in text and reference books we are led to believe that a dose is a dose, and that we can depend on the size with mathematical exactness. Far be this from the physiological and therapeutic truth.

The dose of a medicine is the amount of the substance which exists in the blood or comes in contact with and acts upon the tissues at one time. This is the true meaning of the word when considered from the standpoint of pharmacodynamics. A more common definition and one that applies to the everyday use of the word would be that "a dose is the quantity of a medicine required to produce a given effect and is usually given at one time." A still more common application of the word is to consider the amount of a remedy given at one time to be a "dose." Thus it is considered by the laity. The pharmacist, however, should consider the dose as the amount required to produce an effect. This leads him to read the directions on the prescription and see how often as well as how much is to be taken.

The size of the dose is regulated not only by the frequency of the administration, but by several other conditions worthy of our consideration.

The weight of the patient should be taken into account, for the result of the action of a remedy is in proportion to the weight of healthy tissue with which it comes in contact. Thus, one grain of a medicine will, other conditions being equal, produce the effect on a person weighing 100 pounds that will result from a two grain dose on a 200 pound individual. Patients with dropsy, tumors or excessive fat are not amenable to this rule. The average man weighs 143 and the woman 121 pounds. Women require smaller doses than men, not only on account of their being less in weight, but also from a greater susceptibility to the action of medicine.

The method of administration affects the size of the dose. We give but one-half or one-quarter as much hypodermically as by mouth, while enemata require about twice the ordinary dose. It has been found that different tissues of the body take up medicine with varying rapidity, and the serous membranes are most active, intercellular tissue next and mucous membranes next. The size of doses should be in the ratio of this absorption. Liquid preparations are readi-

ly absorbed when compared to powders and pills. This calls for smaller doses of tinctures and fluid extracts than of powder or pills of the same remedy.

Familiarity breeds contempt for the power of medicine, as is evidenced by the excessive doses of morphine that an habituate will take without serious results. Race has its peculiarities, and only about half the ordinary dose is required by the Indians, Chinese, negroes and other dark and yellow races. Some claim that blond Anglo Saxons require larger doses than the brunettes.

The dose of the same remedy varies greatly with the object for which it is administered. Thus, ipecac in large doses is an emetic, while smaller doses will cure obstinate vomiting due to depression. The effect on dose of the age, purity and strength in the active principle of drugs requires no more than mere mention to pharmacists.

New remedies are sometimes given in doses that time and experience revise by either increasing or decreasing the size.

The minim or drop is sometimes used as equal measures when designating doses. The drop, unless made under proper conditions of temperature, size of container, nature of orifice from which drop is passed, quantity of liquid in container, and rapidity of dropping, will vary greatly with the same liquid. The relative size of drops of different liquids is shown by tables to be found in most standard works of reference.

The age of the patient plays such an important part in the regulation of the size of the dose that many rules have been devised to estimate the approximate dose in relation to age. Perhaps Dr. Young's is as safe and generally used as any. It is as follows:

Add twelve to the age of the child and divide the age by this sum. The quotient is the fraction of an adult dose to be administered. Thus: A child two years old would require 2 plus 12, equal 14; 2 divided by 14 equals one seventh. If the adult dose was seven grains the dose for a child of 2 years would be about one grain.

Old age again calls for smaller doses, but the requirement is not as generally respected as in childhood.

A table of doses is given below which will assist in determining the amount for different ages:

Age.	Dose.	Grams.
1 month	3 grs.	0.200
3 months	4 grs.	0.250
6 months	6 grs.	0.400
9 months	7 grs.	0.450
1 year	9 grs.	0.550
2 years	10 grs.	0.650
3 years	12 grs.	0.750
4 years	15 grs.	0.950
5 to 6 years	20 grs.	1.250
7 to 8 years	30 grs.	2.000
10 to 12 years	40 grs.	2.500
13 to 15 years	45 grs.	3.000
18 to 20 years	50 grs.	3.250
20 to 50 years	1 dram.	4.000

Age.	Dose.	Grams.
50 years	50 grs.	3.250
60 to 70 years	45 grs.	3.000
80 to 90 years	40 grs.	2.500
100 years	30 grs.	2.000

Aside from these influences on the size of the dose the physician must keep in mind the condition of the stomach, personal idiosyncrasy, temperature, temperament, climate, season, time of day, effects of disease, city or country patient, passions under which the patient may be laboring and many other controlling conditions.

I have endeavored to illustrate that no "rule of thumb" can be applied to dosage, so at best our posological tables are suggestive rather than dictatorial. It is unfortunate that we have no absolute guide, but such is the fate of the professional man. Study, consideration and the exercise of judgment are required.

Although my paper may have shaken your faith in dose tables I trust it has increased your interest in pharmacology.

Turmeric-Growing in Bengal.

Turmeric is mostly grown in Bengal on soil containing a mixture of two-thirds of sand and one-third of clay. Stagnant water is always injurious to it, and high, well-drained land is therefore generally selected for its cultivation. The best crops are produced on land of loose texture, which has been lying waste for ten or twelve years. The plants are grown on ridges from 8 to 24 inches apart. Harvesting takes place in January and February. In the Cuttack districts the growers do not allow the turmeric to remain in the land for more than a year, but in other parts of Bengal the outturn of the second year is supposed to be superior in quality and quantity to the first year's harvest. When the rhizomes have been dug out, they are cleared of mud and their rootlets removed. They are then boiled in water in earthen pots, the mouths of which are carefully closed, a very small opening being left. When the water oozes out of this opening, the turmeric is taken out and dried in the sun for eight or ten days. It is then fit for the market.—*Chemist and Druggist.*

TO REMOVE ODORS FROM ALENHICS.—To remove from alembics and stills the odors of essential oils, aromatic waters, etc., ammonium carbonate is highly commended. Add a few ounces of it to the water used for cleaning, and let solution remain in contact from $\frac{1}{2}$ to $\frac{3}{4}$ of an hour.

SITUATIONS WANTED.

POSITION wanted by young man with five years' experience. Graduate O. C. P. Good references. Address—"G. A. S." Box 25, Fergus, Ont.

SITUATION WANTED as Assistant Manager, by a young man with over five years' experience. Accurate dispenser; A. 1 references; graduate O. C. P., Class '04; taken Phm. B. diploma of Toronto University, also sound operator. Address—Box 30, Milton, Ont.