



## Dosage Calculations and Flow Rates

### DO dosage CALCULATIONS

Doctors can prescribe medications in amounts that are not convenient to administer. A tablet or liquid may contain a certain amount of active ingredient, and the prescription might be a multiple or a fraction of that amount.

In these cases, the formula for the conversion is the same:

$$\frac{D}{H} \times Q = \text{Dosage}$$

D is the dosage prescribed, H is the dosage on hand, and Q is the quantity in one dose. D and H should be figures from the question that are expressed in the same unit, and Q should be in the same unit as the answer that you want.

**Example 1:** A doctor prescribes 50 mg of a medication available in liquid form. The bottle says 20 mg/10 mL. How much liquid makes up one dose?

**Solution:** The dosage prescribed is 50 mg, so that's D. Of the two numbers on the bottle, the one with the same unit is 20 mg, so that's H. That leaves 10 mL for Q, which makes sense because we want to know how much liquid there is in one dose, and liquid is measured in mL.

$$\begin{aligned} \frac{D}{H} \times Q &= 1 \text{ dose} \\ \frac{50 \text{ mg}}{20 \text{ mg}} \times 10 \text{ mL} &= 1 \text{ dose} \\ 2.5 \times 10 \text{ mL} &= 25 \text{ mL} \end{aligned}$$

Sometimes the result of the fraction D/H is a nice whole number, and sometimes it's a decimal fraction. Usually the answers to these problems work out to whole numbers or fractions like 2/3. There are a couple of strategies you can use to make this calculation easier and avoid decimals.

**You can multiply D × Q first** instead of dividing D ÷ H. In order of operations, multiplication and division have equal priority, so it doesn't matter which one you do first. In Example 1, we could multiply 50 × 10 = 500, and then 500 ÷ 20 = 25 mL, and no decimal fractions are involved.

**You can cancel some of H first** by finding common factors with either D or Q or both. Making the divisor H smaller will make the problem easier. In Example 1, we could cancel the 10 in Q with 10 from H, leaving us with  $\frac{50}{2}$ , which gives 25 mL.