

Medicine Math

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Math and Medicine

Many people have pets. Those pets may need a medication to help them stay healthy and comfortable. Using sixth grade math concepts, you can figure out the dosages of medicine that your pet may need.

Animals vary in size and weight. To give the correct amount of liquid medication, it is necessary to determine the dose in milligrams per weight and the volume to administer in milliliters. This presentation will show the steps to figuring out the dose of a medication along with two examples.

This is an example on how sixth grade math can be used in our future careers. I chose this topic because I have always been interested in animals and how to treat them.

Steps

1. Convert the animal's weight from pounds to kilograms, as most medicine dosing regimens use the metric system.
2. Determine the correct dose of medicine in milligrams for the animal based on its weight. The correct dose can be found through various sources.
3. Determine the correct volume of liquid medicine in milliliters to give to the animal based on its weight. The concentration of liquid can often be found on the bottle.

Examples

The following slides will show you two examples of how everyday math can be used to figure out medicine dosages and volumes according to the animal's weight. The first example, on slides 5-9, will show how to use math to find the dose of Metacam for a dog. The other example, found on slides 10-14, will show how to find the correct dosage of Convenia for a cat.



About The Dog

Mickey the dachshund is 14 years old. He weighs 23.5 pounds. Mickey has arthritis. His vet suggested he take a medicine called Metacam. This medication is used to treat joint inflammation. The following slides will show how to figure out the dosage of medicine he will need to take daily.



Step 1: Converting Pounds to Kilograms

$$\frac{23.5 \text{ lbs}}{X} = \frac{2.2 \text{ lbs}}{1 \text{ kg}} \longrightarrow \text{Cross Multiply}$$

$$2.2x = 23.5$$

$$X = \frac{23.5}{2.2}$$

$$X = 10.7$$

Mickey weighs 10.7 kilograms.

Step 2: Determine the Dosage

The dose is 0.2 mg/kg on day one and half of that for the rest of the treatment.

$$\frac{0.2 \text{ mg}}{\text{Kg}} = \frac{X}{10.7 \text{ kg}}$$

$$X = 0.2 \cdot 10.7$$

$$X = 2.1 \text{ mg}$$

Mickey needs approximately 2 mg of medicine on day one and 1 mg of medicine daily for the rest of the treatment.

Step 3: Find the Volume to Administer

The concentration of Metacam is 1.5 mg per mL.

$$\frac{1.5 \text{ mg}}{1 \text{ mL}} = \frac{2 \text{ mg}}{X}$$

$$1.5x = 2$$

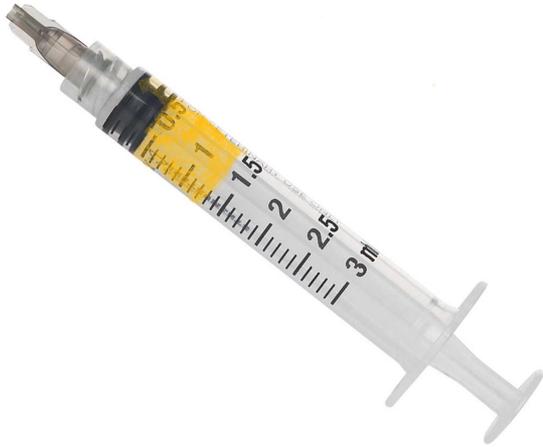
$$X = \frac{2}{1.5}$$

$$X = 1.3 \text{ mL on day 1}$$

Mickey would get 1.3 mL of Metacam on day 1. For the rest of his treatment days, Mickey would get 0.65 mL daily. 0.65 mL would be rounded to 0.7 mL.

Measuring Volume With a Syringe

This image shows the volume of Metacam in mL that Mickey needs on the first day of treatment for his arthritis.



1.3 mL

This image shows the amount of Metacam Mickey needs from the second day until the end of his treatment.



0.7 mL

About The Cat

Minnie is a British Shorthair. She is 5 years old and weighs 12 pounds. Minnie has a bacterial skin infection. When she went to the vet, they decided to give her a medicine called Convenia. Convenia is an antibiotic that requires only one dose. Steps to figuring out the dosage of Minnie's medication will be on the next slides.



Step 1: Converting Pounds to Kilograms

$$\frac{12 \text{ lbs}}{X} = \frac{2.2 \text{ lbs}}{1 \text{ kg}} \quad \longrightarrow \quad \text{Cross Multiply}$$

$$2.2x = 12 \text{ lbs}$$

$$X = \frac{12}{2.2}$$

$$X = 5.5 \text{ kg}$$

Minnie weighs 5.5 kilograms.

Step 2: Determine the Dosage

The dose of Convenia is 8 mg per kg subcutaneous (under skin) injection.

$$\frac{8 \text{ mg}}{1 \text{ kg}} = \frac{X}{5.5 \text{ kg}}$$

$$X = 8 \cdot 5.5$$

$$X = 44 \text{ mg}$$

Minnie needs 44 mg of Convenia.

Step 3: Find the Volume to Administer

The concentration of Convenia is 80 mg per mL.

$$\frac{80 \text{ mg}}{1 \text{ mL}} = \frac{44 \text{ mg}}{X}$$

$$80x = 44 \text{ mg}$$

$$X = \frac{44}{80}$$

$$X = 0.55 \text{ mL}$$

Minnie needs 0.55 mL of Convenia.

This image shows the amount of Convenia Minnie needs.



0.55 mL

Summary

- Finding the correct amount of medication to give an animal involves a few simple steps.
- Veterinarians do this daily in their practice.
- This type of math is also used by human health professionals.
- Many scientific problems can be answered by solving for x .

Thank you! Stay Safe!