How to Calculate Drug Dose & Drug Volumes in Animal Studies

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- **To calculate the correct dose of drug you need to know:**

     1- The <u>concentration</u> of the <u>drug</u>

     2- The <u>weight</u> of the <u>animal</u>

     3- The recommended <u>dose rate</u> of the drug for each specific animal model

1- Concentration of the drug

mg/ml: Manufacturers usually provide concentrations of their product in milligrams (mg) of drug per (ml) of solvent

Percentage % : 10% solution of Drug A is 10gm/100ml, a 2% solution of Drug A is 2gm/100ml (20mg/ml)

IU/ml: International Units per ml of, like some of the fat soluble vitamins

Powders: The **mg** of active drug in the **vial** (mg/vial).
 For example, Drug B comes in powdered form with 500mg per vial:
- If you add **5ml** of sterile water for injection to the vial thus providing **5ml** of **100mg/ml drug**
- If you add **2.5ml** of sterile water for injection, will make **2.5ml** of a **200mg/ml** solution

2- Weight of the animal

• It is always best to use a scale and get an accurate weight.

• If you cannot weigh the animal prior to injection, you need to be experienced in estimating the weight

3- Dose rate of the drug

• Always look up the drug dose for the species you are working with - it often varies

Species	Reference body weight (kg)	To convert dose in mg/kg to dose in mg/m², divide by K_m	To convert human dose in mg/kg to AED in mg/kg, either	
			Multiply human dose by	Divide human dose by
Human	60	37		
Mouse	0.02	3	12.3	0.081
Hamster	0.08	5	7.4	0.135
Rat	0.15	6	6.2	0.162
Ferret	0.30	7	5.3	0.189
Guinea pig	0.40	8	4.6	0.216
Rabbit	1.8	12	3.1	0.324
Dog	10	20	1.8	0.541
Monkeys (rhesus)	3	12	3.1	0.324
Marmoset	0.35	6	6.2	0.162
Squirrel monkey	0.60	7	5.3	0.189
Baboon	12	20	1.8	0.541
Micro pig	12	27	1.4	0.730
Mini pig	40	35	1.1	0.946

Q/ How to administer metformin powdered at a dose rate of 200mg/kg to a 250 g rat? Using metformin powder

Dose (mg) = dose rate (mg/kg) x Wt (kg)

Dose = 200 mg/kg x o.25 kg = 50 mg of metformin powder needed

Q/ How to administer phenobarbital at dose rate 50mg/kg to 200g rat? (Using phenobarbital ampoule 200mg/ml)

Dose (mg) = dose rate (mg/kg) x Wt (kg)

Dose (mg) = 50mg/kg x 0.2 kg = 10 mg of phenobarbital

Dose (ml) = dose (mg) / drug conc.(mg/ml)

Dose (ml) = 10 mg / 200 mg/ml = o.o5 ml of phenobarbital

How to administer xylazine at a dose rate of 10mg/kg to a 300 g rat?(You are using 2% xylazine)

Dose (mg) = dose rate (mg/kg) x Wt (kg)

Drug conc. (mg/ml) = % x 10

Dose (ml) = dose (mg) / drug conc.(mg/ml)

The proper dose for a 300g rat is: 10 x 0.3kg= 3 mg of xylazine

2% xylazine is 20 mg/ml

3/20 = 0.15 ml of 2% xylazine

Q/ How to administer ceftriaxone at a dose rate of 20mg/kg to 0.4 kg rat? Using 500mg/vial of ceftriaxone

- **Dose (mg) = dose rate (mg/kg) x Wt (kg)**

Dose= 20 mg/kg x 0.4 kg = 8 mg of ceftriaxone

- If you add **5ml** of sterile water for injection to the vial thus providing **5ml** of **100mg/ml drug**

Dose (ml) = dose (mg) / drug conc.(mg/ml)

Dose = 8 mg / 100mg/ml = 0.08 ml of ceftriaxone needed

Thank You