



Dosage Calculations per kg

Study Development Worksheet

Example

A patient is prescribed a drug. The patient weighs 36kg and the drug has a dosage of 4mg/kg of bodyweight per hour. If the patient needs to take the drug every 20 minutes, and the drug comes in a concentration of 2mg/ml, what volume of the drug should be administered in a single dose?

Answer

Step 1	The dosage of the drug is 4mg/kg of body weight per hour.
Step 2	The patient weighs 36kg.
Step 3	Hourly dose (mg/hour) = weight (kg) x dosage (mg/kg/hour) Hourly dose (mg/hour) = 36kg x 4mg/kg/hour = 144 mg/hour.
Step 4	The drug needs to be administered every 20 minutes, so 3 times per hour. Single dose (mg/dose) = $\frac{\text{hourly dose (mg/hour)}}{\text{number of doses per hour (doses/hour)}} =$ $\frac{144 \text{ mg/hour}}{3 \text{ doses/hour}} = 48 \text{ mg/dose}.$
Step 5	The concentration of the drug is 2mg/ml. Volume of the drug (ml/dose) = $\frac{\text{single dose (mg/dose)}}{\text{concentration (mg/ml)}} = \frac{48 \text{ mg/dose}}{2 \text{ mg/ml}}$ = 24 ml/dose.



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Exercises

1. A patient is prescribed a drug that has a dosage of 2mg/kg of bodyweight per day. The patient weighs 40kg. How much of the drug should the patient take in the day?
2. You need to give a child a painkiller, to be taken twice daily. The painkiller has a dosage of 3mg/kg of bodyweight per day. The child weighs 55kg. How much of the painkiller should the child take in a single dose?
3. A patient is prescribed a drug that has a dosage of 1mg/kg of bodyweight per day. The patient has recently been trying to lose weight, and has lost 2kg in the last month. They now weigh 105kg. They need to take the drug 3 times per day. The drug has a concentration of 0.5mg/ml. What is the volume of the drug that the patient should take in a single dose?
4. You are asked to give a post-surgery patient a single dose of a painkiller. The drug can only be given in whole milligrams. The patient weighs 77kg. The drug has a daily dosage of 2mg/kg of bodyweight, and should be taken four times daily. How much of the painkiller should you give the patient in order to be the most accurate to their correct dosage?
5. A patient is given one of their three daily doses of a drug. They take two pills, each containing 20mg of the drug. The patient weighs 80kg. What is the dosage of the drug per day?



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Answers

1.

Step 1	The dosage of the drug is 2mg/kg of body weight per day.
Step 2	The patient weighs 40kg.
Step 3	Daily dose (mg/day) = weight (kg) x dosage (mg/kg/day) Daily dose (mg/day) = 40kg x 2mg/kg/day = 80 mg/day.

2.

Step 1	The dosage of the drug is 3mg/kg of body weight per day.
Step 2	The patient weighs 55kg.
Step 3	Daily dose (mg/day) = weight (kg) x dosage (mg/kg/day) Daily dose (mg/day) = 55kg x 3mg/kg/day = 165 mg/day.
Step 4	The drug needs to be taken twice a day. Single dose (mg/dose) = $\frac{\text{daily dose (mg/day)}}{\text{number of doses per day (doses/day)}} =$ $\frac{165 \text{ mg/day}}{2 \text{ doses/day}} = 82.5 \text{ mg/dose.}$

3.

Step 1	The dosage of the drug is 1mg/kg of body weight per day.
Step 2	The patient weighs 105kg.
Step 3	Daily dose (mg/day) = weight (kg) x dosage (mg/kg/day) Daily dose (mg/day) = 105kg x 1mg/kg/day = 105mg/day.
Step 4	The drug needs to be taken 3 times per day. Single dose (mg/dose) = $\frac{\text{daily dose (mg/day)}}{\text{number of doses per day (doses/day)}} =$ $\frac{105 \text{ mg/day}}{3 \text{ doses/day}} = 35 \text{ mg/dose.}$
Step 5	The concentration of the drug is 0.5mg/ml. Volume of the drug (ml/dose) = $\frac{\text{single dose (mg/dose)}}{\text{concentration (mg/ml)}} = \frac{35 \text{ mg/dose}}{0.5 \text{ mg/ml}} =$ 70 ml/dose.



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4.

Step 1	The dosage of the drug is 2mg/kg of body weight per day.
Step 2	The patient weighs 77kg.
Step 3	Daily dose (mg/day) = weight (kg) x dosage (mg/kg/day) Daily dose (mg/day) = 77kg x 2mg/kg/day = 154 mg/day.
Step 4	The drug needs to be taken 4 times per day. Single dose (mg/dose) = $\frac{\text{daily dose (mg/day)}}{\text{number of doses per day (doses/day)}} =$ $\frac{154 \text{ mg/day}}{4 \text{ doses/day}} = 38.5 \text{ mg/dose}.$
Step 5	We now need to round the single dose to the nearest mg. Since we are rounding to the nearest whole unit value, we must pay attention to the first value after the decimal point. Since this value is 5, we round the number up. We add 1 to the rounding number and then replace everything to the right with zeros. Therefore, a single dose should be 39mg/dose.

5.

Step 1	Since the patient takes two 20mg pills in a single dose, a single dose is 40mg of the drug.
Step 2	The patient takes the pills 3 times daily, so the total daily dose is Daily dose (mg/day) = single dose (mg/dose) x number of doses per day (doses/day) Daily dose (mg/day) = 40 mg/dose x 3 doses/day = 120mg/day.
Step 3	The patient weighs 80kg.
Step 4	Dosage (mg/kg/day) = $\frac{\text{daily dose (mg/day)}}{\text{weight (kg)}} = \frac{120 \text{ mg/day}}{80 \text{ kg}} = 1.5 \text{ mg/kg of}$ bodyweight per day.



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