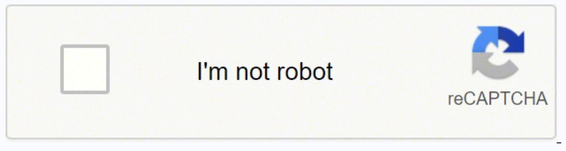

Next

What is the formula for calculating iv flow rate in ml/h

Ensuring each patient is given the right medicine and the right dose is everyone's responsibility. This section is relevant to everyone in nursing care - even if you are not the individual who initially calculated the dosage. We all play a vital role in checking the dose given to the patient and any of us has the potential to catch an accidental error which might otherwise lead to the wrong dose being provided to those in our care. In the 'Tackling number problems' section, the ‘PEACE’ problem-solving method is introduced. Some of this information is repeated here. You may wish to review the 'PEACE' method before going further if you've not already done so, or, you may wish to jump ahead to the heading ‘Approach 1 – mental arithmetic’ if you're already comfortable with 'PEACE'. Plan Start by thinking through what you need to do. Your goal is to calculate how many tablets to give a patient based on the required dose (what you want) and the strength of the tablets (what you’ve got). You may also need to consider how much medication they have already taken so you don’t go over the daily dosage. Your patient. It is possible that you may need to take account of the patient’s weight, as the dosage may be dependent on this. This is common in paediatric nursing (great care is needed in this context, as small errors in dose or quantity of medicine may be harmful, due to the infants small body size). The units. Before you can move on to estimation and calculation, you first need to ensure that the drug is in the same units as the prescription. Estimation and calculation is much more difficult if they are in different units and therefore also more likely to lead to a mistake). Converting between metric (SI) units is covered in detail in the 'Metric (SI) units' section of this resource. Once the available drug and prescription are in the same units, you can do an estimate. The consequences. It is also worth pausing to consider the type of medication you are going to administer and the vulnerability of the patient – how serious are the consequences of a mistake? If the consequences of a mistake are serious, you should check the calculation with a colleague, particularly if you are unfamiliar with the medication or patient group. Estimate It is important to first try to estimate the answer before you start to calculate. A number of ways of estimating are covered in the 'Estimation' section of this resource. Approach Before you calculate, remember to ask yourself the following questions. WHAT There are basically two approaches that can be used to calculate dosage: mental arithmetic and applying a formula. Using both methods together as a tool for checking your answer is a great approach to give you confidence that you have the right answer. HOW Here is a summary of the steps you’ll need to follow when calculating dosage. Modify the required dosage (the prescription) base on the patient’s weight, if necessary Check the units are the same (prescription units are the same as the units of the tablet) and if they are not then convert them to the same unit. Choose your method: mental calculation or use the formula. Choose your tools: mental arithmetic, pen, paper, calculator. WHEN and WHERE You may also wish to consider where (and when) you are going to do the calculation – for an important calculation you will probably want to find a quiet place with no distractions. You may wish to consider if you are currently under pressure or fatigued and if there is time to wait to do the calculation when you are in a better “state of mind” Calculate Let’s look at some examples of how to calculate flow rate and drop rate. We’ll start with flow rate. Flow Rate When using electronic infusion controllers, the flow rate needs to be set. The rate is the volume in ml divided by the duration in hours (mls per hour). This calculation can be expressed as a formula- Flow rate = Volume (ml) / Time (hours) Drop Rate When using manual infusion controllers, the drop rate needs to be set (drops per minute). This can be calculated using the following formula- Drop rate = Drop factor x Volume/60 x Time (hours) One further part of this formula is the drop factor. On some types of controller, the size of each drop of liquid is governed by the internal mechanics – it is fixed and cannot be altered. Typically, it is written on the machine. This constant quality gives rise to the drop factor: Drop factor = the number of drops it takes to make up one ml of fluid. Two common sizes are: 20 drops per ml (typically for clear fluids) 15 drops per ml (typically for thicker substances, such as blood) Now that we've looked at some examples, see if you can solve the following problems (there are a mix of flow rate and drop rate questions). Evaluate When you have completed your calculation, remember to check your work. Here's a reminder of the ways you might do this: repeat the calculation ask a colleague to check your answer try to calculate the answer again using a different method check against the recommended dose range (e.g. using the British National Formulary) look for unusually big or small answers. Calculating the duration of an infusion You may need to calculate how long an infusion will last. Consider this example: How long will a 100ml infusion of sodium bicarbonate last if it is running at 42 drops per minute? In this example, we'll assume the drop factor for the equipment is 20 drops per ml. To solve this, we first need to find out how many millilitres are transfused per minute, we do this as follows: The drop rate is 42 drops per minute. The drop factor is 20 drops per ml. If we divide 42 drops per minute by 20 drops per millilitre, we'll find out how many millilitres per minute. 42/20 = 2.1 ml per minute. Now we can divide the overall infusion of 100ml by the millilitres tranfused per minute to get our answer: 100 ml / 2.1 ml per minute = 47.6 minutes. Now here's one for you to try A patient is to be given 1000 ml by IV using a controller with a drip factor of 15 drops/ml. The infusion starts at 8.00am. If the drip rate was set at 25 drops per minute, at what time would the drip be complete? (The answer is calculated below). Answer: If we divide 25 drops per minute by 15 drops per millilitre, we get how many millilitres per minute = 1.67 ml/min. If we then divide 1000ml by 1.67 ml per minute we get 600 minutes. 600 minutes = 10 hours 8am plus 10 hours = 6pm To calculate milliliters/hour (mL/hr) using hours: To calculate mL/hr using minutes: Examples 1. If an order was written to infuse a liter (1000 mL) of IV fluid every 8 hours, what rate would the IV pump be set for? Volume = 1,000 mL Hours = 8 The answer is 125 mL/hr. 2. You have recieved a new admission from the E.R. The patient has class IV CHF and the doctor has ordered a loading dose of Inocor® (amrinone lactate). The loading dose is to be administered over 3 minutes. Pharmacy has brought the loading dose as a 50 mL IVPB. At what rate should the IVPB be infused? Volume = 50 mL Minutes = 3 min The answer is 1,000 mL/hour TranscriptFAQsFact SheetCalculatorWelcome to this video tutorial on calculating IV drip rates. When you have an order for an IV infusion, it is the nurse’s responsibility to make sure the fluid will infuse at the prescribed rate. IV fluids may be infused by gravity using a manual roller clamp or dial-a-flow, or infused using an infusion pump.Microdrip and Macrodrip Regardless of the method, it is important to know how to calculate the correct IV flow rate. When calculating the flow rate, determine which IV tubing you will be using (microdrip or macrodrip), so you can use the proper drop factor in your calculations. The drop factor is the number of drops in 1 mL of solution, and is printed on the IV tubing package.Macrodrip and microdrip refers to the diameter of the needle where the drop enters the drip chamber.Macrodrip tubing delivers 10 to 20 gtts/mL and is used to infuse large volumes or to infuse fluids quickly. Microdrip tubing delivers 60 gtts/mL and is used for small or very precise amounts of fluid, as with neonates or pediatric patients.If you simply need to figure out the mL per hour to infuse, take the total volume in mL, divided by the total time in hours, to equal the mL per hour. For example, if you have 1,000 mL NS to infuse over 8 hours, take 1,000 divided by 8, to equal 125 mL/hr. To calculate the drops per minute, the drop factor is needed. The formula for calculating the IV flow rate (drip rate) is total volume (in mL) divided by time (in min), multiplied by the drop factor (in gtts/mL), which equals the IV flow rate in gtts/min.Example 1 Let’s try an example. The provider has ordered 1,000 mL Lactated Ringers to infuse over 8 hours. You have a macrodrip tubing with a drop factor of 15 gtts/mL. Calculate how many gtts/min to set as the IV flow rate.Using the formula, 1,000 mL divided by 8 times 60 (since we have 8 hours times 60 min/hr), then multiply by 15 gtts/min to equal 31.2, rounded to 31 gtts/min.Here’s a tip: when the IV tubing is microdrip, 60 gtts/mL, the drops per min will be the same as the mL per hour. For example, you have 500 mL to infuse over 12 hours with a microdrip set. The total volume (500 mL) divided by the total time in hours (12) equals 41.6, rounded to 42 mL per hour. The drops per minute would be calculated as total volume, divided by time (in minutes), multiplied by the drop factor of 60 gtts/min, which also equals 41.6, rounded to 42 drops per minute.Example 2 Let’s look at an example of an IV piggyback medication.Ancef 1 gm in 100 mL normal saline to be infused over 30 minutes. You have macrodrip tubing with a drop factor of 10 gtts/mL. Calculate how many gtts/min to set as the IV flow rate.Use the formula, with 100 mL divided by 30 min, multiplied by 10 gtts/min, which equals 33.3, rounded to 33 gtts/min. If you need to set this up on an IV infusion pump, use the formula, volume (mL) divided by time (min), multiplied by 60 min over 1 hour, this equals the IV flow rate in mL/hr. Using this formula, 100 mL divided by 30 min, times 60 min in 1 hr, equals 199.9, rounded to 200 mL/hr.Once the infusion has started, monitor closely to be sure it is infusing at the correct rate and check the patient’s IV site for signs of infiltration or inflammation.Thank you for watching this video about calculating IV drip rates!An IV drip rate is a way of describing the rate of an intravenous infusion based on the number of drops (gtt) that are administered to the patient per minute. This is influenced by the type of the tubing (microdrip or macrodrip), the total volume that is required to be infused, and the time over which the infusion is ordered to run.An IV drop factor reflects the specific size of the drops of IV fluid that the tubing set creates. This is a predetermined number based on the tubing required and available to administer the medication. Tubing can be either microdrip or macrodrip.Microdrip IV tubing creates extremely small drip sizes for medications that are potent and must be carefully administered and/or for patient populations that are highly sensitive to large doses of medications (namely, neonatal and pediatric patients). The microdrip drip factor is generally estimated at 60 gtt/mL.Macrodrip IV tubing is the more standard tubing type, and has larger drops of fluid than microdrip tubing. The macrodrip drip factor is generally somewhere between 10 to 20 gtt/mL.IV drip rate is calculated by this simple formula: IV Drip Rate (gtt/min) = Total Volume (mL)/Time (min) x Drop Factor (gtt/mL)This equation can also be rearranged to calculate the time required for an infusion, when provided the volume to be infused, the drip rate, and the drop factor.Critical to perform prior to completing this formula is any conversions required, such as fluid volume provided in liters converted to milliliters, or time for infusion provided in hours converted to minutes. Return to Patient Care Videos 396112278763 by Mometrix Test Preparation | Last Updated: February 17, 2022

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