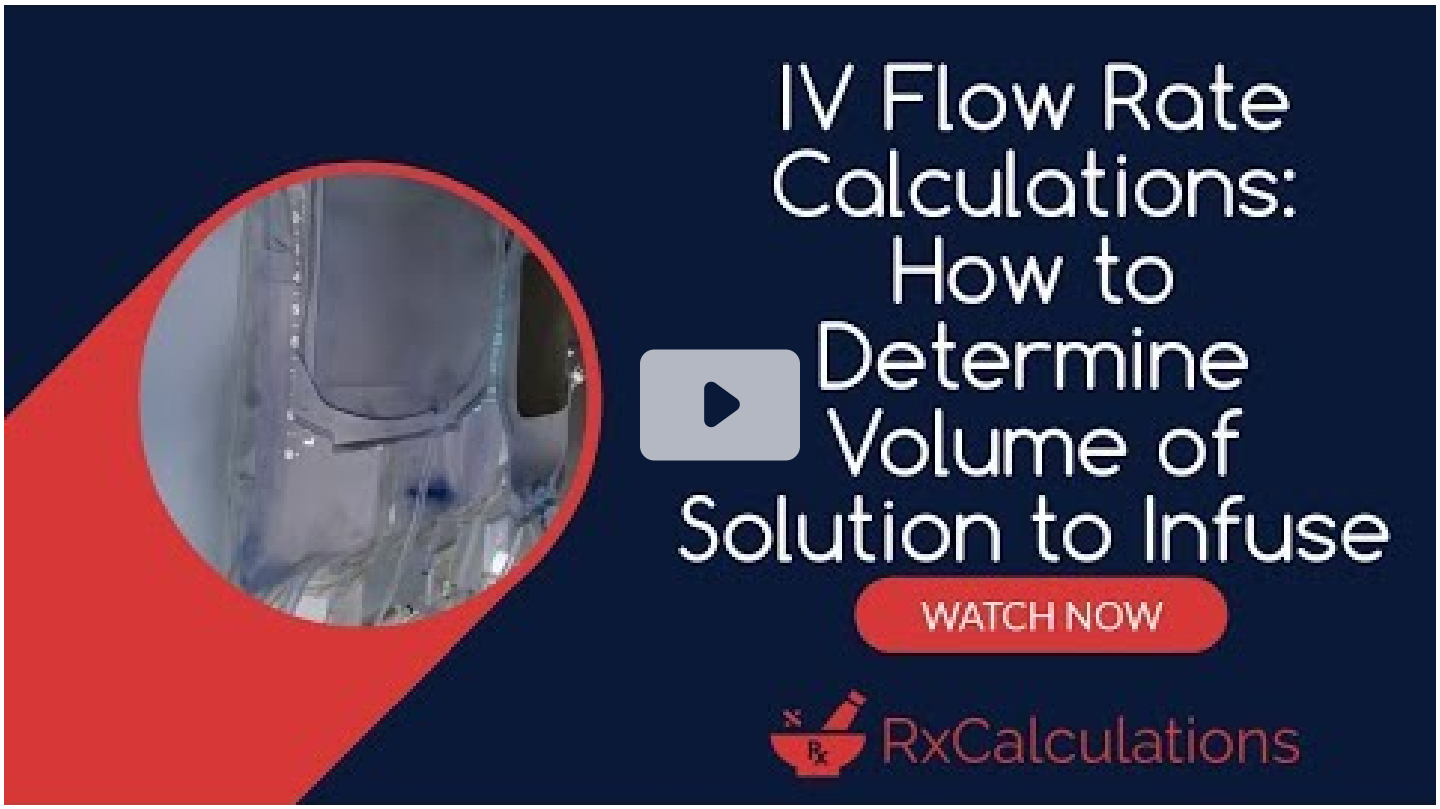
How to Determine Volume of Solution to Infuse

RxCalculations

How to determine volume of solution to infuse is an important type of intravenous (IV) flow rate calculations question that you should know how to solve. In this blog post, I am going to use two NAPLEX type iv flow rate calculations questions to show you how to solve calculations questions where you have to determine the volume of solution to infuse when you have been given the iv flow rate, time and drop factor.

Watch the Video



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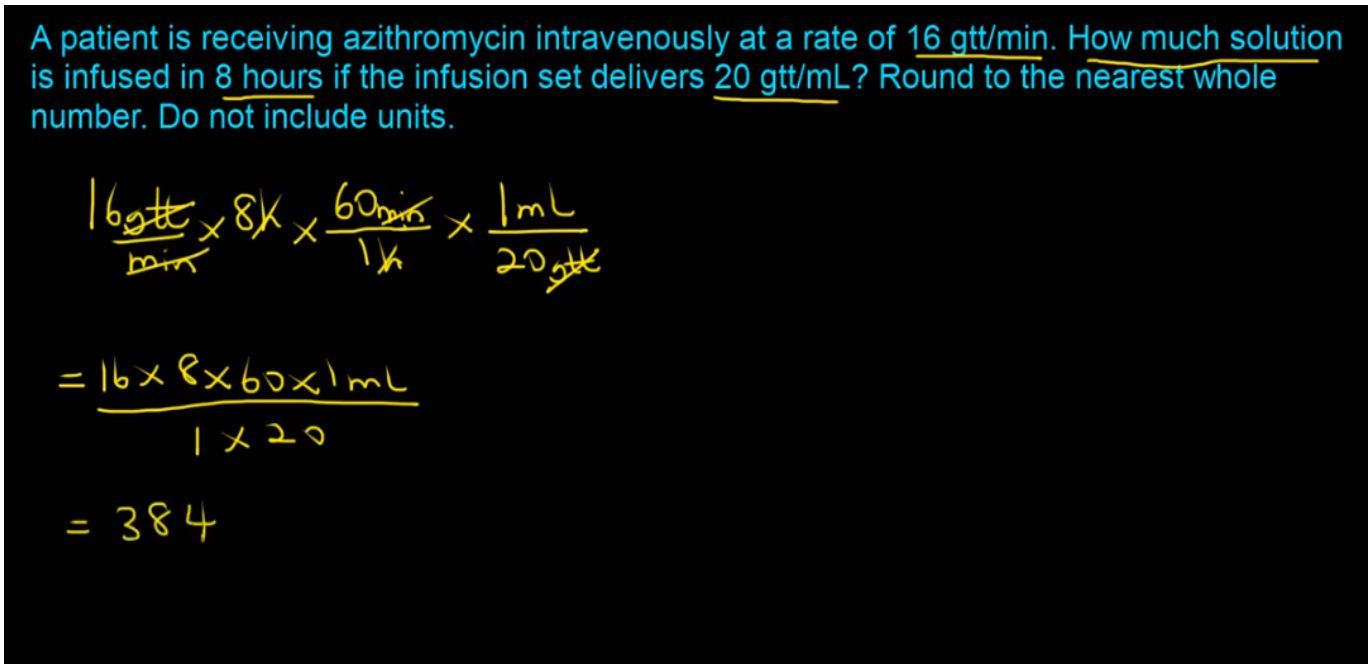
I'm going to show you **how to determine the volume of solution** to be infused given the IV flow rate, the time and the calibration factor and we are starting right now.

Hello, this is Dr. Danquah and if this is your first time here and you'd like to learn pharmaceutical calculations, tips, tricks and more then start by subscribing, and clicking the bell so you don't miss anything.

So this video is part of a series on IV flow rate calculations. Be sure to check the other videos out. I'll put links in the description and a card with a playlist should be coming up pretty shortly.

Example 1

So let's take a look at the first question which says a patient is receiving azithromycin intravenously at a rate of 16 gtt/min. How much solution is infused in 8 hours if the infusion set delivers 20 gtt/mL. Round to the nearest whole number. Do not Including units.



Now let's start by analyzing the question. Our goal is to determine how much fluid is given to the patient. And what we've been given is the IV flow rate in drops per minute, we have the time of infusion, which is eight hours, and we have the calibration or drop factor.

And so the strategy will be to start off with the IV flow rate. So we have 16 drops per minute and our first goal is to basically get rid of the minutes in the denominator. Okay, so we need that time quantity. And we see we have eight hours in the question. So we multiply this by eight hours.

Now since we are using dimensional analysis, the way it works is the units in the numerator should be the same as the units in the denominator for them to cancel out.

So as we see we have hours in the numerator and minutes in the denominator so that will not work. Which means we need to first convert the hours to minutes

So we make use of the conversion factor that 60 minutes, make one hour, and now the hour can cancel out, and the minutes can also cancel out.

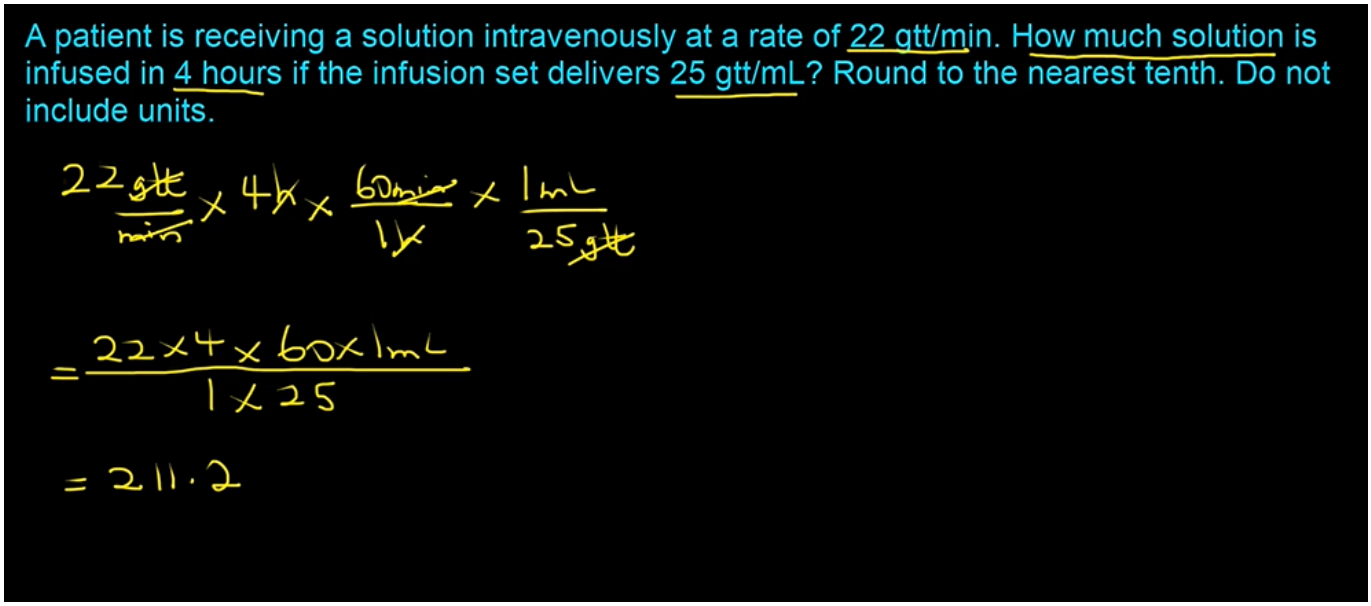
So now we are in drops. Okay. So what you want to do next is to get rid of the drops from the numerator, and so we need some quantity with a drop component and that's where the calibration factor becomes pertinent.

So we'll take the calibration factor, and because we want volume, we will flip it and so end up saying that one milliliter contains 20 drops. So now the drops can cancel out, and you are left with volume term milliliters.

And so the next step will be to take all the terms in the numerator. So we'll have 16 times eight times 60 times 1 milliliter, and we'll divide that by everything in the denominator, so have 1 times 20. And if you go ahead and do the Math, we end up with 384.

Example 2

Let's take a look at another question. This one says a patient is receiving a solution intravenously at a rate of 22 gtt/min. How much solution is infused in 4 hours if the infusion set delivers 25 gtt/mL? Round to the nearest tenth. Do not include units.



How to Determine Volume of Solution to Infuse

So let's start off by analyzing this question. Our goal is to determine the volume of fluid that is infused.

We've been given the IV flow rate, we've been given the time that is being infused for and we have also the calibration or drop factor.

And so the strategy will be to start off with the IV flow rate. And so what that will look like is you have your 22 drops per minute. And now we need to get rid of the minute term from the denominator.

So we need the term in the question as the time component. And that will be the four hours, so we multiply this by four hours.

Now for the dimensional analysis to work, you need to have the same units, the numerator and the denominator for it to cancel out.

So now we have hours and minutes. And that doesn't match. So we need to convert the hours to minutes. Okay.

So we now say that 60 minutes, make an hour. And now the hour can cancel out and the minutes can cancel out.

And so now you are in drops, okay. And so we need to get rid of the drops from the numerator. So we need the term or a quantity that has drops in it, and that's where the calibration or drop factor will become important.

And because we're looking for volume, we're going to flip the drop factor. And so we end up saying that one milliliter contains 25 drops, and the drops cancel out, and now you are left with milliliters.

And so the next step would be to take all the terms in the numerator and multiply them out.

So that will be 22 times 4 times 60 times 1 milliliter, and then we'll divide that by everything in the denominator, that will be 1 times 25. And if you do the math, you end up with 211.2.

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