HOW TO CALCULATE AN IV DRIP RATE

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IV drip rate describes the rate at which an intravenous infusion is administered in drops per minute. Use of an IV pump to automatically control the rate of infusion is now common in most medical settings in the United States. However, an IV pump may not be available in some settings/emergencies. In these situations, it is important that nurses know how to calculate the IV drip rate and set the rate of infusion using the IV tubing roller clamp.

Tubing type

Factors such as client age and size will guide selection of IV tubing. Pediatric clients are very sensitive to fluid volume → microdrip tubing is used to tightly control fluid volume administration. Macrodrip tubing is typically used for adult clients.

Macrodrip

10, 15, or 20 gtt/mL
Used for adults

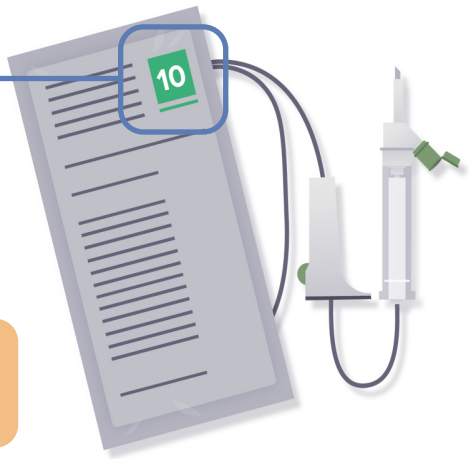
Microdrip

60 gtt/mL
Used for pediatric clients

Drop factor

Once you select the appropriate tubing for your client, determine the drip factor (= number of drops in one milliliter of fluid). The packaging of the IV tubing will typically indicate the drop factor. Sixty drops per mL is the standard for microdrip tubing. Macrodrip can range from 10 to 20 drops per mL.

10
gtt/mL



Medical abbreviation:
gtt = drops

Order

Typically, the order will include the volume of medication or fluid to be infused and either a rate per hour or the overall duration of the infusion. It is the nurses job to use this information to determine the IV drip rate in gtt/min.

Sample order:

0.9% normal saline, 1000 mL IV over 8 hr, drip factor = 10

Set drip rate

To set the IV drip rate, count the drops as fluid enters the drip chamber. Adjust the roller clamp until you count 20 drops entering chamber per minute.

For safety, label IV bag with the ordered rate and time the hourly markings for infusion.

Calculation

First, convert total infusion time to minutes: $8 \cancel{hr} \times 60 \text{ min} / \cancel{hr} = 480 \text{ min}$

Then, use the IV drip rate formula:

$$\text{Drip rate (gtts/min)} = \frac{\text{(Total volume [mL])} \times \text{(Drop factor [gtts/mL])}}{\text{Time (minutes)}}$$

Plugging in the values from our example:

$$\text{Drip rate} = \frac{1000 \cancel{mL} \times 10 \text{ gtt} / \cancel{mL}}{480 \text{ min}} = \frac{10{,}000 \text{ gtt}}{480 \text{ min}} = 20.8 \text{ gtt/min, round to nearest} \rightarrow \textbf{21 gtt/min}$$