Equation summary:

Calculating the number of tablets or volume of elixir

$$\text{Tablets required} = \frac{\text{what you want}}{\text{what you have got}} \times \text{units it's contained in}$$

Calculating the volume for injections

$$\text{Volume required} = \frac{\text{what you want}}{\text{what you have got}} \times \text{volume it's contained in}$$

Calculating IV Fluid Infusion Rates for Fluids with Gravity Feed Infusion Sets

1. The number of ml to be given per minute.
2. Multiply this figure by the number of drops in 1ml.

N.B. Where normally 20 macrodrops = 1ml crystalloid.

UPGRADE Study Advice Service:

If you have difficulty with Drug Calculations, please contact us:

We can offer on the spot advice, or you can book a tutorial (30 minutes) **Email:** upgrade@brookes.ac.uk

Check out the website for times and locations
www.brookes.ac.uk/services/upgrade

Any student - Any course - Any year

This summary sheet has been based on the Drug Calculations Workbook created by the Faculty of Health and Life Sciences at Oxford Brookes University, with special thanks to Angela Harper, Paul Ong and Irmgard Huppe.

Drug Calculations: Summary sheet

Things to remember

- Check that you are working with the same units.
- Look at your result and ask *is this a reasonable dose*?
- If you are ever unsure, always get someone to check your result.

Basic Metric Units

Common metric abbreviations:

Gram	=	g
Milligram	=	mg
Litre	=	l
Millilitre	=	ml
Microgram	=	mcg

Prefixes:

Kilo	=	one thousand times	=	(1000)
Centi	=	hundredth part of	=	(0.01)
Milli	=	thousandth part of	=	(0.001)
Micro	=	millionth part of	=	(0.000001)

1 Kilogram (kg)	=	1000 grams (g)
1 gram (g)	=	1000 milligrams (mg)
1 milligram	=	1000 micrograms (mcg)
1 litre	=	1000 millilitres (ml)

Calculating the number of tablets or volume of elixir

Use this formula:

$$\frac{\text{Dose prescribed}}{\text{Dose available}} \times \text{ Units in which the drug is available}$$

Example: 20 mg of furosemide is prescribed (what you want) and the ward stock is 5mg tablets (what you have got):

$$\frac{20\text{mg}}{5\text{mg}} \times 1 \text{ tablet} = 4 \times 1 \text{ tablet} = 4 \text{ tablet}$$

Notice how the units (mg) cancel to leave tablet as the remaining unit. Check that the units that you end up with are what you expect.

Example: 10 mg of temazepam is prescribed and the ward stock is 25mg in 20ml elixir. Therefore, the required injection dose is:

$$\frac{10\text{mg}}{25\text{mg}} \times 20 \text{ ml} = 0.4 \times 20 \text{ ml} = 8 \text{ ml}$$

Calculating the volume for injections

Here is a simple way for calculating volume for injections:

$$\text{Volume required} = \frac{\text{strength}}{\text{stock strength}} \times \text{volume of stock solution}$$

Example: A patient is prescribed cortisone 40mg I.M. Ampoules contain cortisone 50mg in 2ml. Calculate the volume required for injection.

$$\text{Volume required} = \frac{40\text{mg}}{50\text{mg}} \times 2\text{ml} = 0.8 \times 2\text{ml} = 1.6\text{ml}$$

Calculating IV Fluid Infusion Rates for Fluids with Gravity Feed Infusion Sets

When you need to calculate the number of drops per minute for an I.V. infusion rate, you need to know the following information:

1. Prescription giving volume of fluid to be infused and time over which is to be given
   e.g. 1 litre of 0.9% Sodium Chloride over 8 hours.
2. If you are using a gravity-feed infusion set you will need to know the number of drops which make up 1 ml. This is written on the packaging.

N.B. normally 20 macrodrops = 1ml crystalloid

Then simply calculate the following;

3. The number of ml to be given per minute.
4. Multiply this figure by the number of drops in 1ml.

e.g. For 1 litre of 0.9% Sodium Chloride over 8 hours:

$$\frac{1000\text{ml}}{8\text{hours}} = 125\text{ml/hour}$$

$$\frac{125\text{ml}}{60\text{mins}} = 2.08\text{ml/min}$$

2.08ml/min x 20 drops/ml = 41.6 drops per minute

This is closest to **42 drops per minute** so you would run the infusion at a 42 drops per minute rate.