Te Whatu Ora
Health New Zealand
Waitematā

Finding your way through the Medication Administration Test

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1. Introduction

All nurses and midwives, anaesthetic techs and renal techs employed by Health NZ - Waitematā must complete a medication administration competency assessment within 4 weeks of employment. If you are a new graduate, then this must occur within 6 weeks of employment.

This workbook is designed to give you information about this process and to assist in your preparation for the assessment. It contains the following sections

- The Health NZ - Waitematā medication administration competency assessment process
- An overview of the online theory test and helpful hints
- Copies of Health NZ - Waitematā general policies – you will need to check that they are the latest versions
- Suggestions for policies for your area/ information covered in your service specific questions – this may be added to by the person (educator) responsible for your orientation
- Calculations practice

2. Medication competency assessment process

This process is relevant for all registered nurses, enrolled nurses, anaesthetic technicians, renal technicians who

- Are newly appointed staff
- Are part of the Health NZ - Waitematā NETP/NESP programmes
- Have transferred from a different area within Health NZ - Waitematā e.g. paediatrics to adults, medicine to surgical within Health NZ - Waitematā
- Have been identified as requiring performance management for safe medication administration

The process consists of two parts

- A computer test. **While the test has a password, you may refer to policies/information on the intranet/internet during the test**
- A series of practice competency sign offs relevant to the specific area of work.

When transferring between like clinical areas (e.g surgical to medical, EDW to Rangitra) you may not have to sit all three tests. Instead it is likely you will only have to sit test three. Check with your educator/coach, who will contact the Medication Safety NS to credit the first two tests. This will need to be done before you sit the test.

2.1 Computer test

This test consists of three sections. Each section must be passed before moving on to the next section. The test itself is managed by an invigilator/verifier – usually the educator/coach for your area.

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Section	Content	Pass rate
One Calculations	Paediatric/ Neonatal OR Adult	100 %
Two Generic Policy	General policy General adult **OR** paediatric/ neonatal monitoring and administration practices If applicable • Blood transfusions • Peripheral Intravenous administration and monitoring • Injection technique (S/C and IM)	80%
Three Service Specific	Specific management practices Area specific standing orders Area specific protocols/practices	80%

2.2 Practice Competency sign off

This process is dependent on the area of work. However, the practice signoffs must be completed as soon as possible after sitting the medication test. These can be done electronically but they must be completed by a Level 2 nurse who is acting as a preceptor, a Level 3 or above nurse/technician or senior midwife. Either the paper copies or notification that you have completed the e-competencies must be given to the educator/person responsible for your orientation. Once each has been completed you may administer the medication as per the sign off. For example, once you have had the general competency completed you may give oral or IV or s/c or IM medications unsupervised and once you have completed the blood signoff you may give blood products as per policy

Competency Assessment	Specialty Area
Routine medication administration – can be oral or IV	All areas
Blood component/product administration	All areas where blood/blood products are administered on a regular basis. Some areas (e.g. neonates will have a separate competency process as required) If your area doesn't give blood often, It is possible you may need to get this completed in an area which gives blood more frequently
Epidural PCEA/PCA	Midwifery and surgical settings
Standing Orders	Refer to service specific list of standing orders and competencies require
Central Venous Access Devices	Completed as part of orientation to specific areas e.g. surgical, medical settings

Other clinical areas may have other competency assessment processes.

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2.3 Resitting the test

If you fail the on-line test, there is provision for **one re-sit on another day within 2 weeks** of first sitting the test i.e. not immediately afterwards. Resitting straight away increases the chance of another failure as you will be stressed as well as possibly needing to spend extra time studying.

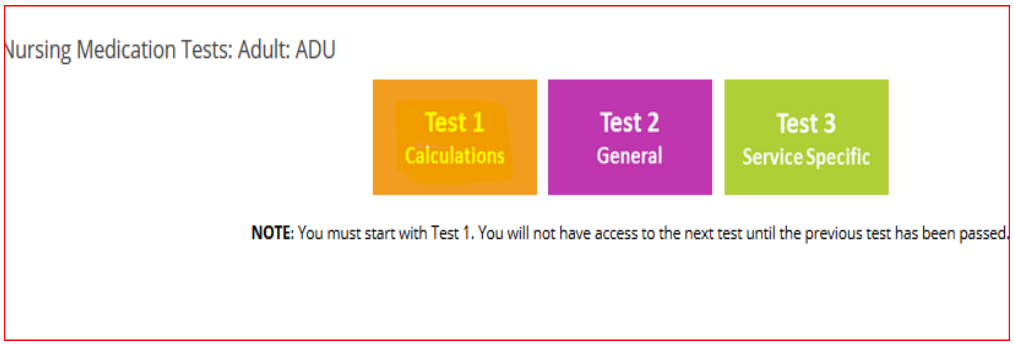
You will be supported educationally before you resit.

A second failure will result in discussion with the educator/nominated person, and your manager who may escalate to more senior staff in order that the appropriate support plan can be put in place.

3. Computer Test Process and Hints

3.1 Content

- The computer assessment is divided into three sections (aka tests)
  - TEST ONE – Calculations
  - TEST TWO- General policy
  - TEST THREE- Service specific



TEST ONE – CALCULATIONS (100% pass required)
These calculations include fluid, tablet, amount and ratio calculations. Please see the information and practice questions at the back of the book for examples. It is important that you do this as you need to get 100% in the calculations, or you will not be able to move on.

TEST TWO – GENERAL POLICY (80 % pass required) see also Section 4 – General Policy information, which shows you how to find the policies and lists more specific relevance

The general policy questions are based on Waitematā DHB policy content. These include

- Medication Management and Competence Assurance
- Medication Administration and Monitoring (Adults) or (Neonates/Paediatrics)

Also if relevant for your area policies about:

- Peripheral Cannulation and Maintenance
- Injection technique – IM and SC
- Blood transfusion

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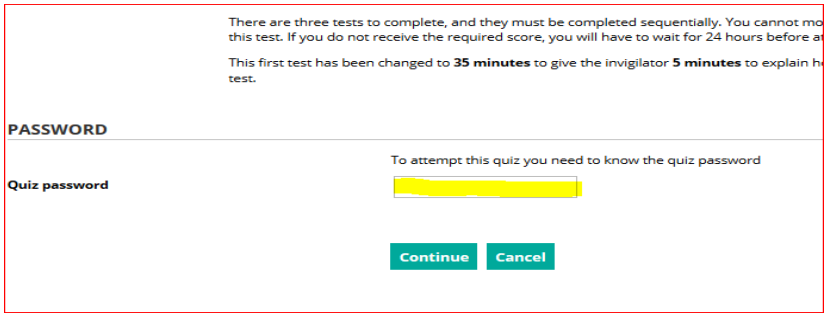
TEST THREE – SERVICE SPECIFIC (80% pass required)

Your area educator will let you know the information you need to study for this area. In general, it covers commonly used medications, as well as specific practices and standing orders. For example, if you use PCAs in your area then there are likely to be a question or two on this.

3.2 Log on Process

- You will need to log on to Health NZ - Waitematā e-learning system (Ko Awatea) to do the test. The log on is the same as the one you used for the other e-learning you have completed e.g. fire, infection control etc
- The **invigilator/verifier** will also need to put in a protected password for you to start the test, once you are logged on.
- This password will also need to be entered by the **invigilator/verifier** as you move onto the next test



3.3 Timing

- There is no specific time limit on the tests. Please discuss with your educator/ person doing your orientation the time it may take to complete.

3.4 General Rules/ Hints

- You will be given a calculator and blank working paper for the calculations section.

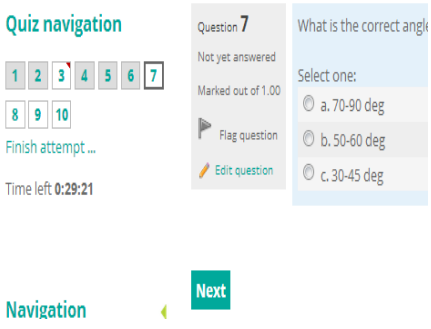
- It is suggested that you do the drug calculations by working out in full on a piece of paper and then check with the calculator before choosing the answer. Swedish rounding - 0.1-0.4 is round down e.g. 33.33 = 33 or 0.5 – 0.9 is rounded up e.g. 66.66 = 67. Please note there are some ratio questions.

- The date/time for the test will be arranged with the educator/coach senior staff member facilitating your orientation. The invigilator/verifier will be available during the whole test for questions

- Please read all the questions **slowly and take your time** to read all of the answers before making your choice. However, there is the facility to go back to questions you are unsure of before you finally submit your attempt. Unanswered questions will be automatically flagged, and you are

also able to manually flag a question to go back to before finally submitting. You will also be able to change your answer if you wish

- While you can refer to policies during the tests, it is expected that you take time to familiarise yourself with the policies used in the tests. We encourage you to do this so that when giving medications you are aware of expected practice without having to look up a policy every time you administer a medication. We are also encouraging you to check if you are unsure.
  - VIEW OF TEST WHILE SITTING

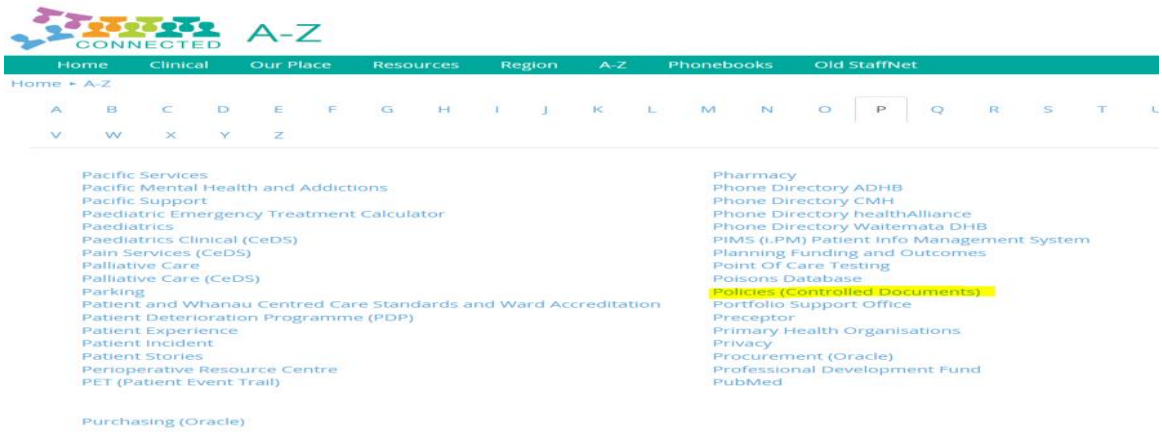


REVIEW OF QUESTIONS BEFORE SUBMITTING

4. General Policies (Test two)

This next section contains a list of the medication administration policies used in test two. These policies contain the information you need for the general policy questions. The policies you will need will depend on the clinical area you work in. You will not be asked questions that have no relevant connection to your areas. E.g. if you work in the community you will not be asked policy questions on blood transfusions. Please refer to the table below for the policy names and clinical areas and speak to your educators to ensure you understand which policies you need to be familiar with.

Originals of all these policies can be found on the intranet in Policies (Controlled documents) see below.



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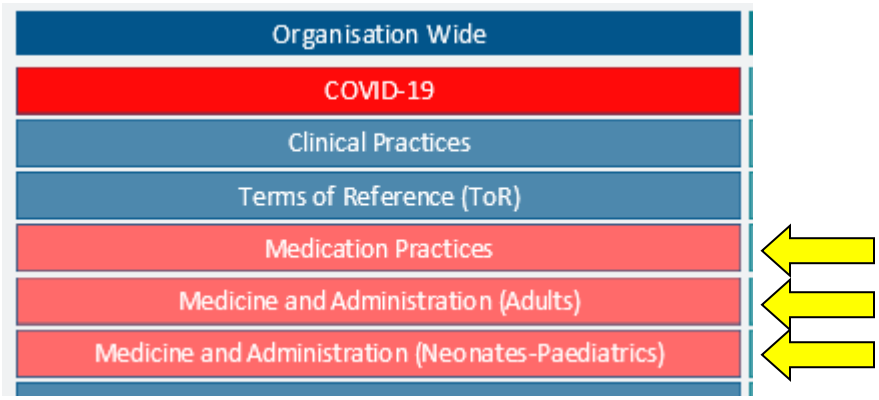

Policy	Description	Relevance to staff
Medication Management and Competence Assurance	Describes • Available resources • Roles and responsibilities of clinical staff in relation to medication (including students) • Expected practice • Competency assessment requirements • Management of incidents	All clinical staff
Medication Administration and Monitoring (Adults)	• Outlines the expected steps staff are to follow to ensure safe administration of medications to adults. • Includes some information on specific medication administration practices as well as expectations for monitoring post administration	All clinical staff administering medications to adults
Medication Administration and Monitoring (Neonates and Paediatrics)	• Outlines the expected steps staff are to follow to ensure safe administration of medications to paediatrics and neonates. • Includes some information on specific medication administration practices as well as expectations for monitoring post administration	All clinical staff administering medications to neonates and paediatrics

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Blood transfusion	• Describes best practice for the prescribing/transport/ administration/monitoring of blood and blood products for both paediatrics and adults	All clinical areas where blood or blood products are administered
Injection – intramuscular and sub-cutaneous (Adults)	• Outlines expected best practice for clinicians who administer IM or S/C injections to adults	All staff involved in administering sub-cutaneous and/or intramuscular injections to adults
Injection – intramuscular and sub-cutaneous (Neonates/Paediatrics)	• Outlines expected best practice for clinicians who administer IM or S/C injections to adults	All staff involved in administering sub-cutaneous and/or intramuscular injections to neonates/ paediatrics
Intravenous – peripheral cannulation, credentialing and care	• Describes credentialing process for peripheral cannula insertion, as well as best practice for use and care of the cannula	All staff involved in the use of peripheral cannula to administer medications
Sub-cutaneous cannula management, medication administration and care	• Outlines expected best practice infusions/regular medications via for clinicians who administer these via sub-cutaneous cannula	All staff who administer sub cutaneous infusions and medications via cannula
Intravenous Administration – Neonates and Paediatrics	• Explains expected practice for the administration of medications and fluids via intravenous cannula in neonates and paediatrics	All staff who administer IV fluids and/or medications to neonates and/or paediatrics

5. Service Specific Policies (test three)

The educator of your service will let you know the policies/ medications you need to be familiar with in order to successfully complete test three.

6. Abbreviations: What do they mean?

PC	after meals	**Stat**	immediately taking precedence over all else
AC	before meals (30 minutes prior as a rule)	**BD or BID**	twice each day (check if required exactly 12hours apart)
:/c	with	**TID**	three times a day (check if required exactly 8hours apart)
IM	intramuscular route	**QID**	four times a day (check if required exactly 6hours apart)
SC	subcutaneous route	**q**	every
PO	per oral route	**qh**	every hour

PV	per vaginal route	**q2h**	every 2 hours
PR	per rectal route	**q4h or qqh**	every 4 hours
Mane	Morning	**Nocte**	Night
NPO or NBM	Nil per orally or nil per mouth – check if all meds are to be with-held		
PRN	Whenever necessary or at the administrator's discretion • Use your judgement to determine whether to give the medication • You must have a rationale for the decision and be accountable • This order goes hand in hand with the administrator's knowledge of the action of the medication, assessment of the patient's status, knowledge of maximum dosage. For example Paracetomol is a well-known, often prescribed mild analgesic. However it can place stress on the liver if given at a dose of more than 4 grams in a 24 hour period or if someone has liver failure. • Ensure that you assess the effect of the prn medication and if you have to administer it frequently discuss with the prescriber – it may not be meeting the patient's needs. For example Ventolin is often prescribed prn – frequent administration can lead to tachycardia or a masking of a worsening asthma attack and it may be that other medication also needs to be prescribed		

Numerical Conversions/Abbreviations

1 gram	=	1 000 milligrams	1 mcg	0.001 milligram
1 milligram	=	1 000 micrograms	g	means gram
1 gram	=	1 000 000 micrograms	mg	means milligram
1 000 mcg	=	1 milligram	mcg	means microgram
100 mcg	=	0.1 milligram		
10 mcg	=	0.01 milligram		

7. Drug Calculations (Pitfalls and Practice)

7.1 Pitfalls and How to Avoid Them

1) Microgram maybe abbreviated using either the Greek symbol – "µg" or as "mcg". Always be aware that either abbreviation may be misinterpreted as "mg" (milligrams).

2) **DON'T** use commas between groups of zeros; they may be mistaken for a decimal point.

3) When there is a numeral preceding a decimal point, always place a nought to the left of the point e.g. 0.3. The nought draws attention to the decimal point.

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4) You may use a calculator, but we recommend that you don't rely completely on the calculator. Use it to check your calculation.

5) When you have completed a calculation, always ask yourself **"DOES IT SEEM RIGHT"**. If your answer seems unusually large or small it may be incorrect. Go back and check carefully.

Remember you are accountable for your practice.

7.2 Formula and Rules

Use this formula – **For tablets and solutions.**

Formula

$$\frac{\text{What you want}}{\text{What you have}} \times \frac{\text{Volume / amount on hand}}{1} = \text{Volume required}$$

Be selfish! Put want you want first!

ALWAYS express what you want and what you have in **THE SAME TERMS.**

e.g. You want 150 mg
You have 0.5g / ml
0.5g = 500mg

There are three basic rules you must observe when you are doing calculations of any sort.

FIRST BASIC RULE - When simplifying fractions, what you do to the top, you must also do to the bottom

Example:

If you have a fraction like $\frac{500}{1000}$ you can simplify it by dividing the top and bottom

numbers by a number that will go evenly into both i.e. a common denominator.

In this case we could use a common denominator or 100 so:

$\frac{500}{1000}$ divided by 100 = $\frac{5}{10}$

In effect, we have removed two noughts from the top and bottom numbers.

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This fraction 5/10 can be further simplified by the same process, using a common

denominator of 5 so:

5	divided by 5	=	1
10	divided by 5	=	2

SECOND BASIC RULE - When converting fractions to decimals divide the top number (numerator) by the bottom number (denominator)

Numerator / Denominator = decimal

Example:

Fraction is 1/2 To get decimal - 1 ÷ 2 = 0.5

Example:

Fraction is 26/50 To get decimal 26 ÷ 50 = 0.52

THIRD BASIC RULE -

To multiply decimals by 10, 100 or 1 000, move the decimal point to the right as many places as there are noughts in the multiplier.

To divide decimals by 10, 100 or 1 000, move the decimal point to the left as many places as there are noughts in the divider.

Example:

Multiply decimals by 10, 100 or 1 000

0.3	x	10	=	0	3.	=	3
0.03	x	100	=	0	03.	=	3
0.003	x	1 000	=	0	003.	=	3

Example:

Dividing decimals by 10, 100 or 1 000

3/10	=	3	divide	10	=	0.3

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3/100 = 3 divide 100 = 0.03

3/1 000 = 3 divide 1 000 = 0.003

7.3 Practice Examples

Use the formula and the basic rules with the example below:

Example:

The dose required is 3.125 mg. You have 12.5 mg/mL in stock.
What volume do you administer?

$$\frac{3.125 \text{ (what you want)}}{12.5 \text{ (what you have)}} \times \frac{1 \text{ (volume)}}{1}$$

3.125 ÷ 12.5 = 0.25

0.25 x 1mL = 0.25mL

Sample calculations numbers 1 - 8

1. Charted dose – 80 mgs

The medication is available in 200mg / 2 mls.
What volume do you administer?

2. Charted dose – 0.2 mgs

The medication is available as 0.6 mgs / ml.
What volume do you administer?

3. Charted dose – 1 ml of a syrup that contains 30 mg / 5 mls

How many mg will the baby receive?

4. **Charted dose – 1200 mgs**

The medication is available in 300 mg tablets.
How many tablets will you administer?

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5. Charted dose – 750 mgs

The medication is available in 500 mg tablets which are scored. (A lower dose is not manufactured)
How many tablets do you administer?

6. Charted dose – 75 mgs

The medication is available as 100 mg / ml.
What volume do you administer?

7. Charted dose – 10 mgs

The medication is available as 15 mg / ml.
What volume do you administer?

8. Chartered dose – 0.2 mgs

The medication is available as 500 mcg / ml.
What volume do you administer?

CHECK YOUR ANSWERS, DO THEY SEEM RIGHT

ANSWERS AND WORKING SHOWN OVER THE PAGE

Sample calculation answers 1 - 8

1. Volume to be administered – 0.8 ml

$$\frac{80\text{ mg}}{200\text{ mg}} \times \frac{2\text{ ml}}{1} = \frac{160}{200} = \frac{8}{10} = 0.8\text{ ml}$$

2. Volume to be administered – 0.33 ml

$$\frac{0.2\text{ mg}}{0.6\text{ mg}} \times \frac{1}{1} = \frac{0.2}{0.6}$$ (move decimal point one place to the right) $$\frac{2}{6} = \frac{1}{3} = 0.33\text{ml}$$

3. The baby should receive - 6 mg

$$\frac{1\text{ ml}}{5\text{ ml}} \times \frac{30\text{ mg}}{1} = \frac{30\text{ mg}}{5} = 6\text{ mg}$$

4. Amount to be administered – 4 tablets

$$\frac{1200\text{ mg}}{300\text{ mg}} \times \frac{1\text{ tablet}}{1} = \frac{1200}{300} = 4\text{ tablets}$$

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5. Amount to be administered – 1 ½ tablets or 1.5 tablets

750 mg	x	1 tablet	=	750	=	3 = 1.5 tablets
500 mg	x	1	=	500	=	2

6. **Volume to be administered – 0.75 ml**

75 mg	x	1 ml	=	75	=	0.75 ml
100mg	x	1	=	100		

7. Volume to be administered – 0.66 ml

10 mg	x	1 ml	=	10	=	2 = 0.66 ml
15 mg	x	1	=	15	=	3

8. Volume to be administered – 0.4 ml

Step 1: Change mg to mcg 0.2 x 1000 = 200 mcg

200 mcg	x	1	=	2	=	0.4 ml
500 mcg	x	1	=	5		

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Sample calculations numbers 9 - 17

9. Charted dose – 1.5 mgs

The medication is available as 10 mg / 2 mls
What volume do you administer?

10. Charted dose – 60 mgs

The medication is available as 250 mg / 10 mls.
What volume do you administer?

11. Charted dose – 0.45 mgs

Then medication is available as 0.6 mg / ml.
What volume do you administer?
How many micrograms is this?

12. Charted dose – 10 mgs

The medication is available as 80 mg / 2 ml.
What volume do you administer?

13. Charted dose – 10 mgs

The medication is available as 12.5 mg / ml.
What volume do you administer?

14. Medication – Digoxin 0.25 mgs **Digoxin 62.5 mcg**

You have two tablets of digoxin in different strengths.
How many tablets of one are equal to the other?

15. Charted dose – 1200 mcg

The medication is available as 0.5 mg / ml.
What volume do you administer?

16. Charted dose – 45 mgs

The medication is available as 100 mg / 2 mls.
What volume do you administer?

17. Charted dose – 45 mgs

The syrup contains 30 mgs of medication in 5 mls.
What volume do you administer?

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Sample calculation answers 9 - 17

9. Volume to be administered – 0.3 ml

$$\frac{1.5\text{ mg}}{10\text{ mg}} \times \frac{2\text{ mls}}{1} = \frac{3}{10} = 0.3\text{ ml}$$

10. Volume to be administered – 2.4 ml

$$\frac{60\text{ mg}}{250\text{ mg}} \times \frac{10\text{ ml}}{1} = \frac{600}{250} = \frac{12}{5} = 2.4\text{ ml}$$

11. Volume to be administered – 0.75 ml

$$\frac{0.45\text{ mg}}{0.6\text{ mg}} = \frac{0.45}{0.6} \times \frac{100}{100} = \frac{45}{60} = \frac{3}{4} = 0.75\text{ml}$$

12. Volume to be administered – 0.25 ml

$$\frac{10\text{ mg}}{80\text{ mg}} \times \frac{2\text{ ml}}{1} = \frac{20}{80} = \frac{1}{4} = 0.25\text{ ml}$$

13. Volume to be administered – 0.8 ml

$$\frac{10\text{ mg}}{12.5\text{ mg}} = \frac{10.0\text{ ml}}{12.5\text{ ml}} \times \frac{10}{10} = \frac{100}{125} = \frac{4}{} = 0.8\text{ ml}$$

14. Four 62.5 mcg tablets are equal to one 0.25 mg tablet

$$0.25\text{ mg} \times 1000 = 250\text{ mcg}$$

$$\frac{250\text{ mcg}}{62.5\text{ mcg}} = \frac{250.0}{62.5} \times \frac{10}{10} = \frac{2500}{625} = \frac{100}{25} = 4\text{ tablets}$$

15. Volume to be administered – 2.4 ml

$$0.5\text{ mg} \times 1000 = 500\text{ mcg}$$

$$\frac{1200}{500} \times \frac{1\text{ ml}}{1} = \frac{12}{5} = 2.4\text{ ml}$$

16. Volume to be administered – 0.9 ml

$$\frac{45\text{ mg}}{100\text{ mg}} \times \frac{2\text{ ml}}{1} = \frac{90}{100} = 0.9\text{ ml}$$

17. Volume to be administered – 7.5 ml

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45 mg	x	5 ml	=	45	x	1	=	45 = 7.5 mls
30 mg	x	1	=	6	x	1		6

7.4 Dilutions and proportions

YOU WILL NOT BE ASKED QUESTIONS ABOUT WEIGHT/VOLUME and PERCENTAGE WEIGHT/VOLUME

This section has additional information for your understanding of weight and percentage weight/ volume terminology

May be as follows:

w / v weight / volume grams in mls

v / v volume / volume mls in mls

w / w weight / weight grams in grams

We are mainly concerned with:

Weight / volume preparations

Equivalent weight / volume

Equivalent weight / volume for concentrations are defined, in the British Pharmacopoeia, as grams and millilitres.
Therefore a 1 : 50 w / v solution is: 1 gram (weight) in 50 mls (volume)

To find out how many mg / ml, convert grams into mgs.

	1 gram	:	50 mls	
	1000mg	:	50 mls	(1000 divide 50)
Therefore	20 mg	:	1 ml	

Percentage weight / volume

Percentage weight volume expresses grams in 100 mls of product.
Therefore a 1 % w/v solution is: 1 gram (weight) in 100 mls (volume)

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To find out how many mg / ml, convert grams to mg.

	1 gram	:	100 mls	
	1000 mg	:	100 mls	(1000 divide 100)
Therefore	10 mg	:	1 ml	

You are able to use your basic medication formula:

$$\frac{\text{What you want}}{\text{What you have}} \times \frac{\text{Volume}}{1}$$

Therefore if the patient is to have 75 mgs Lignocaine and you have Lignocaine 1% i.e. 1 gram in 100 mls

$$\frac{75 \text{ mgs}}{1000 \text{ mgs}} \times \frac{100}{1}$$

75 divide by 10 = 7.5 mls

Therefore you administer 7.5 mls

Another example is your patient is to receive 1 ml of Isuprel 1 : 5000, what weight of Isuprel will be administered.

	1 gram	:	5000 mls	
	1000 mgs	:	5000 mls	
	1 mg	:	5 mls	
	1000 mcg	:	5 mls	(1000 divide 5)
Therefore	200 mcg	:	1 ml	

The weight to be given is 200 mcg, the volume 1 ml.

Sample weight / volume questions numbers 18 - 22

18. The patient is to have Lignocaine 200 mgs. You have Lignocaine 1% solution available. What volume (mls) do you administer?

19. The patient is to have Dextrose 10 gm. You have available Dextrose 50% solution. What volume do you administer?

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20. The patient is to have 1 ml of Adrenaline 1 : 1000 solution.
    How many mg of Adrenaline will be given?

21. The patient is to have Isuprel 400 mcg. You have available Isuprel 1 : 5000.
    What volume do you administer?

22. The patient is to have 1 mg of Adrenaline. You have available Adrenaline 1 : 10 000 (available in 10 mls vials)
    What volume do you administer?

Sample weight / volume answers number 18 - 22

Basic Formula

$$\frac{\text{What you want}}{\text{What you have}} \times \frac{\text{Volume}}{1}$$

18. Volume to be administered – 20 mls Lignocaine 1% solution

Lignocaine 1% solution = 1 gm : 100 mls
1000mg : 100 mls
10 mg : 1 ml

Using the basic formula $\frac{200 \text{ mgs}}{10 \text{ mg}} \times \frac{1}{1} = 20$ mls

19. Volume to be administered – 20 mls of Dextrose 50% solution

Dextrose 50% solution = 50 gm : 100 mls
5 gm : 10 mls

Using basic formula $\frac{10}{50} \times \frac{100}{1} = \frac{100}{5} = 20$ mls

20. There is 1 mg of Adrenaline in 1 ml of Adrenaline solution 1:1000 solution

Adrenaline 1:1000 = 1 gm : 1000 mls
1000 mg : 1000 mls
mg : 1 ml

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21. Volume to be administered – 2 mls of Isuprel 1:5000 solution

Isuprel 1:5000	=	1 gm	:	5000 mls
		1000 mg	:	5000 mls
		1 mg	:	5 mls
		1000 mcg	:	5 mls

Using the basic formula $\frac{400mcg}{1000mcg} \times \frac{5}{1} = \frac{20}{10} = 2$ mls

22. Volume to be administered – 1 mg in 10 mls therefore administer the total 10ml vial

Adrenaline 1:10 000	=	1 gm	:10 000
		1000 mg	:10 000
		1 mg	:10 mls

7.5 Calculating intravenous rates

To calculate an intravenous rate:

Be familiar with the equipment used. All intravenous tubing in the Waitematā District Health Board has a "drip factor" of 20 drops per ml. The system we use is called the REM/Alaris SYSTEM.

Drip Rate Calculation

Volume x Drip Factor / Times in minutes = Total drops / Total minutes = **Drops per minute**

(*Round answer down if less than .4 e.g 61.3dpm = 61dpm,*
round answer up if greater than .5 e.g. 78.7dpm = 79dpm)

Example 1.
The patient is charted 500 mls of intravenous fluid to run over 8 hours using a REM system giving set.
Calculate the drop rate per minute.

$$\frac{500}{(8 \times 60)} \times \frac{20}{1} = \frac{500}{480} \times \frac{20}{1} = \frac{50}{24} \times \frac{10}{1}$$

= 500 divide by 24 = 20.83

= 21 drops per minute

Finding your way through the Medication Administration Test

Example 2.
The patient is to have medication diluted to 50 mls of intravenous fluid using a REM system burette and giving set, administered over 30 minutes.
Calculate the drop rate per minute.

$\frac{50}{30} \times \frac{20}{1} = \frac{100}{3} =$ 33.3 drops per minute
$=$ 33 drops per minute

Intravenous Fluid Calculations Numbers 23 - 26

Calculate the intravenous drip rate for the following calculations. All are administered via the REM system.

23. l000 mls to be administered over 8 hours.
How many drops per minute are to be administered?
How many mls per hour?

24. 500 mls to be administered over 6 hours
How many drops per minute are to be administered?
How many mls per hour?

25. 1000 mls to be administered over 12 hours.
How many drops per minute are to be administered?
How many mls per hour?
After 10 hours how much fluid should be remaining in the intravenous fluid bag?

26. Medication is charted to be diluted to a volume of 50 mls and administered over 30 minutes.
How many drops per minutes are to be administered?

Intravenous Fluid Calculation Answers Numbers 23 – 26

23. Drops per minute – 42 d.p.m

$\frac{1000}{8 \times 60} \times \frac{20}{1} = \frac{2000}{48} =$ 2000 divide 48 $=$ 41.6

24. Drops per minute – 28 d.p.m
Mls per hour – 83.3 mls

$\frac{500}{6 \times 60} \times \frac{20}{1} = \frac{1000}{36} =$ 1000 divide 36 $=$ 27.7

500 divide 6 = 83.3 mls per hour

Finding your way through the Medication Administration Test

25. Drops per minute – 28 d.p.m
Mls per hour – 83.3 mls
Mls remaining after 10 hours administration – 166.6 mls

1000	x	20	=	2000	=	2000 divide 72	=	27.7
12 x 60	x	1	=	72	=			

1000 divide 12 = 83.3 mls per hour

Remaining 166.6 mls of solution for remaining 2 hours, administered 83.3 mls

26. Drops per minute – 33 d.p.m

50	x	20	=	100	=	100 divide 3 =	33.3
30	x	1	=	3			

NB If you know how many drops per minute the patient is receiving it is possible to work out the mls per hour using the following formula, when using a REM system set.

Converting drops per minute to mls per hour

Drops per minute x 3 = mls per hour

Example

6 drops per minute	x	3	=	18 mls per hour
27 drops per minute	x	3	=	81 mls per hour

Converting mls per hour to drops per minute

Mls per hour divided by 3 = drops per minute

Example

45 mls per hour	divide	3	=	15 drops per minute
90 mls per hour	divide	3	=	30 drops per minute