

Pre-Registration Calculations Training

Exercise 1

Please decide whether each statement is TRUE or FALSE

1. 60 g of Canesten[®] HC cream (clotrimazole, hydrocortisone) and 30 g of hydrocortisone 2.5% cream are mixed together. The hydrocortisone concentration in the newly prepared cream is 1.5% w/w.
2. A 5 year old child, who weighs 20 kg, is prescribed morphine sulfate for pain at a dose of 200 micrograms/kg every four hours up to a maximum of four times a day. It is correct to administer this child 2 mL of Oramorph[®] 10 mg/5 mL oral solution (morphine sulfate) for each individual dose.
3. A neonate, weighing 3.5 kg, is prescribed oral alpha tocopherol at a dose of 17 mg/kg daily. An appropriate volume of Vedrop[®] oral solution (alpha tocopherol) for the neonatal nurse to administer to the neonate daily is 1.4 mL.
4. A 70 kg patient requires dobutamine hydrochloride at a dose of 10 mcg/kg/min and dopamine hydrochloride 2 mcg/kg/min. The infusions of each are prepared as follows:

Dobutamine hydrochloride 250 mg in glucose 5% to a final volume of 250 mL
Dopamine hydrochloride 200 mg in glucose 5% to a final volume of 100 mL

An appropriate delivery rate for both of these drugs is 4.2 mL/hour
5. Mrs A is prescribed an oxygen cylinder (1360 litres) with instructions to use it at a medium flow rate of 2 L/min. She uses the oxygen for six episodes daily, with each episode lasting ½ hour. This one cylinder will provide enough oxygen for Mrs A for 3 days.
6. A patient is prescribed phenytoin 400 mg as a slow intravenous injection. Phenytoin 50 mg/mL solution for injection is available in 5 mL vials. The prescribed dose is contained in 8 mL of the solution for injection.

7. You are required to produce 400 mL of a concentrated solution of potassium permanganate. A patient is dispensed this concentrated solution which they will dilute to prepare a foot soak. The patient will dilute 20 mL of the concentrated solution to 250 mL to create a 1000 ppm foot soak. The amount of potassium permanganate which should be used to produce 400 mL of the concentrated solution is 4 g.

8. While on the neonatal ward you are asked by a F1 Doctor to advise her on the dose of caffeine for a 3-day old baby who was born 3 weeks premature. The F1 Doctor wants to administer 10 mg/kg daily of caffeine base as a maintenance dose by intravenous infusion. The baby being administered this drug weighs 6 lbs. It is appropriate for the baby to be administered 27.2 mg of caffeine citrate daily.

9. You are asked to extemporaneously prepare 450 mL of Magnesium Trisilicate Mixture, BP. You should use 0.0225 kg of light magnesium carbonate in your formulation.

10. Following a stroke, which has impacted on the swallow of a female patient she requires her medications to be changed to liquid formulations. She is currently prescribed valsartan 80 mg daily and metformin hydrochloride 500 mg three times a day. It is correct to supply 160 mL of Diovan® oral solution (valsartan) and 100 mL of metformin hydrochloride 500 mg/5 mL oral solution for a 7-day prescription. The patient will receive close monitoring following this change. Her medicines are administered using a 5mL oral syringe which can be used to measure volumes in intervals of 1 millilitre.

11. During a consultation with a patient you discuss their weekly alcohol intake. The patient tells you they drink 2 glasses of a gin cocktail each Monday, Wednesday & Friday nights and a 750 mL bottle of red wine (13% ABV) on a Saturday. The gin they drink has a 37.5% ABV and each cocktail contains a 25 mL measure of gin. This drinking pattern represents 20 units of alcohol being consumed per week.

$$\text{Units} = \frac{\text{Alcohol by Volume (ABV)} \times \text{Alcohol volume}}{1000}$$

12. A 4 week old baby, 6.5 kg, is prescribed trimethoprim 50 mg/5 mL sugar-free oral suspension for prophylaxis of urinary-tract infection. The prescribed dose is 2 mg/kg at night. This baby should be given 1.3 mL for each dose.

13. When 25 g of sodium chloride is dissolved in 50 mL of water and made up to a final volume of 400 mL with water, a 1 in 15 solution of sodium chloride is formed.

14. A patient has been prescribed Tobradex[®] eye drops (dexamethasone, tobramycin) for the short-term treatment of ocular inflammation.

An excerpt from their prescription is:

Tobradex ear/eye drops

Put 1 drop into right eye four times a day for five days, then put 1 drop into right eye three times a day for 48 hours, then put 1 drop into right eye twice daily for 48 hours, then return to clinic for review

A supply of one 5 mL bottle of Tobradex[®] eye drops will be adequate for the patient to cover this treatment.

[15 drops = 1 mL]

15. A 6 year old child has been prescribed 2.5 mL four times a day of Gaviscon Advance[™] suspension (potassium bicarbonate, sodium alginate).

Gaviscon Advance[™] suspension contains 4.6 mmol Na⁺/10 mL. The recommended daily allowance (RDA) of salt for a 6-year-old child is 3 g (equivalent to 1.2 g sodium) per day. The atomic mass of sodium is 23.

This child will consume 5% of their recommended daily salt allowance from the total daily dose of Gaviscon Advance[™] suspension.

16. As a pharmacist prescriber in a pain clinic you are converting a patient from dihydrocodeine tartrate 30 mg tablets to dihydrocodeine tartrate 10 mg/5 mL oral solution due to a change in his swallow. The patient was previously taking 1 tablet four times a day. A prescribed quantity of 300 mL would last him for 14 days of treatment.

You can assume there is no difference in bioavailability between these two formulations.

17. 50 g of sodium bicarbonate is needed to prepare 1 L of a sodium bicarbonate solution, such that 20 mL diluted to 400 mL gives a 0.25% w/v sodium bicarbonate solution.

18. A 63 year old man has a percutaneous endoscopic gastrostomy (PEG) tube in situ. He requires 1800 kcal per 24 hours from his enteral feed, and has been

prescribed Osmolite[®] 1.5 kcal. It is agreed that he will feed for 10 hours overnight. It is appropriate for his feed to be delivered at a rate of 120 mL/hour.

19. A child is prescribed an oral dose of 4000 micrograms of furosemide. The only strength of furosemide oral solution stocked within your hospital dispensary is 20 mg/5 mL. Following your hospital's policy you dilute 5 mL of the oral solution to 20 mL with water. It is appropriate for this child to be administered 4 mL of the resulting liquid.
20. Following receipt of a prescription 250 g of coal tar 10% w/w in white soft paraffin has been made up in the dispensary. On checking the prescription, you realise that 250 g of 20% w/w was prescribed. By adding 15 g of coal tar to 250 g of the 10% w/w product the new product will have a coal tar strength of 20% w/w.
21. A 59 year old woman, who weighs 60 kg, attends a pre-admission clinic at your hospital 4 weeks prior to having orthopaedic surgery. She is found to have moderate anaemia and is prescribed a course of subcutaneous Eprex[®] (epoetin alfa). The epoetin alfa is given at a dose of 600 units/kg once weekly for 3 weeks before surgery and on day of surgery. Over the treatment course the patient will be given 270000 units.
22. This is an excerpt from a legally written prescription
- Prednisolone 5 mg Tablets
50 mg daily for 2 weeks
Then reduce daily dose by 5 mg once
weekly until at zero*
- You only have 4 x 28 tablet packs of prednisolone 5 mg in stock which you dispense in full to the patient. It is correct to give this patient an owing slip for 12 x 28 tablet packs of prednisolone 5 mg tablets.
23. A 53 year old woman who weighs 78 kg presents to hospital after ingesting ethylene glycol (anti-freeze) 1 hour ago. In accordance with hospital guidance, the consultant requests to use oral ethanol for the management of the overdose. The oral loading dose of ethanol (in the form of whisky, gin, vodka at 40% by volume ethanol is 2.5 mL/kg. The pharmacy department supply gin at 35% by volume ethanol. 223 mL of 35% gin is required to provide a loading dose of ethanol for this patient. (You can assume only whole mL doses of ethanol will be administered in cases of overdose).
24. 60 g of Synalar 1 in 4 Dilution[®] ointment contains 375 mg of fluocinolone acetonide.

25. You have to extemporaneously prepare an ointment for a patient with pressure sores. The prescriber has requested for 125 g of Hydromol[®] ointment (emulsifying wax & yellow soft paraffin) to be mixed with 50 g of yellow soft paraffin BP and 10 g of zinc oxide. The strength of zinc oxide in the new ointment is 47% w/w.