

SACT Dose Calculation Examples

Trainees are required to achieve 100% accuracy in the calculations section in order to continue with the accreditation programme.

In clinical practice, if in any doubt with calculations please seek advice from a senior colleague.

You should attempt all questions and seek support where needed.

1. A 50-year-old woman, diagnosed with metastatic breast cancer (bone and liver), presents for chemotherapy treatment. She has been assessed as fit for treatment and you are happy her FBC is acceptable. Doxorubicin $60\text{mg}/\text{m}^2$ and cyclophosphamide $600\text{mg}/\text{m}^2$ have been prescribed.

Calculate the dose of both drugs to be given if the patient's Body Surface Area (BSA) is 1.6m^2 . Please refer to the [NHS dose banding tables](#).

Doxorubicin dose:

Cyclophosphamide dose:

2. You are in clinic verifying prescriptions and need to check the correct dose has been calculated by the prescriber:

- a) For a drug that is usually prescribed at 75mg per kg; if the patient weighs 60kg , what should the dose of the drug be in grams?

g

- b) For a drug that is usually prescribed at $0.05\text{g}/\text{kg}$; if the patient weighs 72kg , what should the dose of the drug be in milligrams?

mg

3. A patient is due to receive rituximab, for the treatment of lymphoma, as part of R-CHOP 21 regimen at a dose of $375\text{mg}/\text{m}^2$ three-weekly. This drug is a monoclonal antibody and the risk of a hypersensitivity reaction is high, it is therefore given with paracetamol, chlorphenamine and prednisolone pre-medications. To reduce the risk of a reaction, the drip rate for the infusion is slowly titrated upwards.

The following instruction for the first dose at cycle 1 is given:

Infuse at a rate of $50\text{mg}/\text{hour}$ for 30 minutes and if tolerated increase by $50\text{mg}/\text{hour}$ every 30 minutes, to a maximum dose of $400\text{mg}/\text{hour}$.

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- a) What is the dose of rituximab the patient should be receiving (BSA 1.71m²)?
Please use the dose [NHS dose banding tables](#).

Rituximab dose:

- b) What does your local intravenous (IV) guide or chemotherapy guide suggest is an adequate diluent volume for rituximab for most patients?

- c) Based on your answers from above, what rate should be entered on the infusion pump in mL/hour for a bag of rituximab? Please complete this without reference to a local standardised table. Please show your workings and round answers to the nearest whole number.

Vial concentration = 10mg/mL

Extra volume added to bag = 65mL

Total bag volume = 565 mL

Final bag concentration = 1.15mg/mL

Please specify the rate the infusion should be given over:

1st 30 mins:

2nd 30 mins:

3rd 30 mins:

4th 30 mins:

5th 30 mins:

6th 30 mins:

7th 30 mins:

8th 30 mins:

- 4. You need to mix a drug which is prescribed at a dose of 675mg and the instruction indicates to dilute to a concentration of 2mg/mL with either sodium chloride 0.9% or glucose 5%.

- a) What volume of diluent should be used?

- b) What would be the volume of diluent if the final concentration was to be 4mg/mL?

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5. A patient develops haematological toxicities and requires a dose reduction of 25%. If the starting dose was 175mg, what will the new dose be?

6. A patient has been dose reduced by 75% and the dose is now 187.5mg. What was the original dose?

7. You are asked to commence a drug for a patient who is participating in a clinical trial. The drug needs to be administered at a rate of 2mg per minute for 15 minutes and then increase if tolerated to 4mg per minute.

Calculate the rate to be administered in mL/hr for the first 15 minutes and then the subsequent rate should it be increased to 4mg per minute. The drug dose is 150mg and the bag contains 75mL.

1st rate:

2nd rate:

8. You are asked to commence a drug for a patient who is participating in a clinical trial. The drug needs to be administered at a rate of 1mg per minute for 15 minutes and then increased if tolerated to 3mg per minute.

Calculate the rate to be administered in mL/hr for the first 15 minutes and then the subsequent rate should it be increased to 3mg per minute. The drug dose is 145mg and the bag contains 58mL.

1st rate:

2nd rate:

9. You need to give atropine as a part of the pre-medication for irinotecan. The drug comes in 600 micrograms in 1 mL.

The dose prescribed is 0.25mg, how many mLs need to be administered so the patient receives the correct dose?

10. a) What volume of diluent (WFI) needs to be added to reconstitute a 500mg powder vial to achieve a concentration of 50mg/mL?

- b) The above drug needs further dilution to achieve a maximum concentration of 5mg/ml. What volume should this dose be made up to if the dose to be given is 750mg?

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- c) If the 750mg was put into a 250 mL bag what is the rate in mLs/hour that this drug can be administered over if the minimum infusion rate is 10 mg/minute?

- 11. Mrs KA is to receive cisplatin at a dose of 80mg/m².

She is 72 years old, weighs 52kg, height is 157cm and her serum creatinine is 68 micromol/L.

(The recommended dose reductions in renal impairment are: GFR > 60ml/min give 100% dose; GFR 45-59ml/min > give 75% dose; <45ml/min consider carboplatin)

For the purposes of this question, please round your answer to the nearest mg.

What is an appropriate dose of cisplatin for Mrs KA? Please use the [NHS dose banding tables](#).

Use the Cockcroft and Gault equation for renal function and Dubois method for BSA.

- 12. Mrs KA returns 3 weeks later for cycle 2 of her cisplatin and her renal function has deteriorated; her serum creatinine is now 90micromol/L

- a) Calculate her new GFR

- b) The doctor decides to change her drug to carboplatin AUC6. What dose should she be having (Use Calvert equation)?

Please use the [NHS dose banding tables](#).

- 13. Mr LM is prescribed a Xelox/Capox regimen (oxaliplatin 130mg/m² IV Day 1 and capecitabine 1000mg/m² twice a day Days 1-14). His BSA is 1.81m².

- a) How many tablets of capecitabine should he be dispensed in total? (Round dose to the nearest whole tablet combination)

On his next visit, the doctors decide to add 8mmols of magnesium into his fluid bag. The nurse only has 50% magnesium sulphate injections.

- b) How many mLs of this preparation are needed?

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14. Drug X is stable for 72 hours in 5% glucose at a concentration of 0.35mg/mL to 1.5mg/mL. The drug is available in 100mg vials each of which has to be reconstituted with 4.7mL of WFI.

a) How many mLs of this reconstituted solution would you need for a dose of 245mg?

b) What volume range of 5% glucose would be suitable to dilute 245mg of Drug X in?

15. A patient is to receive the ABVD regimen; please work out the chemotherapy bags that would need to be made up with reference to the drugs and diluents for a patient whose BSA is 1.6m².

ABVD Protocol:

Doxorubicin 25mg/m² Day 1 and Day 15,

Bleomycin 10,000units/m² Day 1 and Day 15,

Vinblastine 6mg/m² Day 1 and Day 15,

Dacarbazine 375mg/m² Day 1 and Day 15.

16. A patient with a BSA of 1.8m² with NHL has previously received 6 x CHOP-R, how much of the recommended cumulative dose for doxorubicin are they still able to receive in mg?