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Journal of Prescribing Practice – Calculation Skills

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Avoidance of drug errors between hospital and home

Ensing et al (2017) reported that there is a significant rise in emerging literature that highlights the increasing prevalence of medication discrepancies and adverse drug events on discharge from secondary care settings. They identified that the primary reasons for these deficits included the complexities of multiple healthcare professionals being involved in the patients' care; inadequate documentation; miscommunication and changes in medication regimes from home to hospital and vice versa. Furthermore, a systematic review of the literature, undertaken by Alqunae et al (2020) identified that care transition from hospital to community settings increases the risk of adverse outcomes for patients resulting from prescribing, dispensing and administration errors, failure to monitor and follow up the patient, and poor communication between practitioners, with some mistakes resulting in hospital readmission, serious harm or death.

Broadhead (2020) identified that transcribing medication regimens on discharge home or transfer to other care settings, accounts for a notable explanation for adverse drug errors and advises that transposing information should only be undertaken by those who are competent to do so. Thorough evaluation of current practice in prescribing, transcribing, dispensing and administration should be undertaken to assure health care practitioners' collective participation in meeting the aim to "reduce severe, avoidable harm related to medications by 50% in the next 5 years" (World Health Organisation, 2017, pg.5).

Consider the following drug calculations, reflect on how errors occur and contemplate strategies for avoidance of patient harm:

Question 1

Mrs. Smith, aged 47, is discharged from hospital following abdominal surgery for advanced bowel cancer. Her discharge medications include: Co-codamol 30/500mg tablets, 2 tablets QDS as required.

- a. Assuming Mrs. Smith takes the maximum dose of 8 tablets in any 24-hr period, how many tablets need to be prescribed to ensure she has sufficient pain relief for 2 weeks?

Mrs. Smith's condition deteriorates due to severe opioid-induced constipation and disease progression. She is transferred to the hospice setting, where she is prescribed Buprenorphine trans-dermal patches 10 micrograms/hour once weekly.

- b. How many mg of Buprenorphine will Mrs. Smith have over a 35 day stay?

On discharge home, the Buprenorphine trans-dermal patches are incorrectly transcribed, and the community pharmacist issues Buprenorphine trans-dermal patches at 5 micrograms/hour once weekly. Mrs. Smith changes her patch on that day.

- c. Over a 4-week period, how much Buprenorphine does Mrs. Smith not receive?

Question 2

Samuel is 5 years old and has been prescribed antibiotics following a visit to A&E. The dose to be administered is:

Antibiotic A 250mg/5ml, 500mg TDS for 7 days.

The quantity requested by the prescriber is one 100ml bottle and this is dispensed by the hospital pharmacy.

- a. For how many days will Samuel not receive his antibiotics?

Samuel is readmitted to hospital and is commenced on intravenous antibiotics. The dose of Antibiotic B is 1g BD for 10 days, administered in 50ml saline per dose.

- b. How much saline (in litres) will be administered over this 10-day period of treatment?

Question 3

Arthur is 72 years old and has been diagnosed with Stage 2 hypertension in primary care. He is prescribed Drug A by his GP at a dose of 5mg once daily. He is admitted to hospital with a minor stroke and during his admission on the Medical Assessment Unit, the dose of Drug A is increased to 10mg twice daily. On discharge from hospital, Arthur receives this 10mg strength in his discharge drugs. However, Arthur takes his 10mg tablets as prescribed, plus his previously prescribed 5mg tablets once daily.

- a. What total amount of Drug A is Arthur taking daily?
- b. The maximum dose of Drug A according to the British National Formulary (2021) is 10mg daily. Over the next 60 days, how many mg is Arthur taking, in total, over the maximum recommended dose?

Question 4

Patient B has been admitted to hospital with hyperglycaemia. During stabilisation in hospital, Patient B commences a biguanide (strength of each tablet is 500mg) and is then discharged back to their care home after 2 days. The regime on discharge is:

Week 1 – 500 mg once daily

Week 2 – 500 mg twice daily

Week 3 – 500 mg three times a day

- a. How many tablets should be supplied on discharge?

The GP reviews the patient after 3 weeks and increases the biguanide to 1g three times a day and prescribes 3 months' supply. The tablet strength remains at 500mg. Unfortunately, the care staff continue to administer 500mg once daily only.

- b. After 3 months (90 days) how many 500 mg tablets remain untaken?

Question 5

Jane has inflammatory arthritis and is assessed by her Consultant Rheumatologist in secondary care. She is started on hydroxychloroquine sulfate 200mg tablets twice daily. The maximum daily dose is 6.5 mg/kg per day. Jane weighs 55kg.

- a. Is Jane prescribed hydroxychloroquine in accordance with the guidance?
- b. The community pharmacy dispenses hydroxychloroquine sulfate 300mg tablets in error. How much more hydroxychloroquine sulfate (in g) will Jane consume over a 60-day period?

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Answers

Question 1:

- a. 112 tablets
- b. 8.4 mg
- c. 3.36 mg

Question 2:

- a. 4 days
- b. 1 litre

Question 3:

- a. 25 mg
- b. 900 mg

Question 4:

- a. 42 tablets
- b. 450 tablets

Question 5:

- a. No
- b. 12 g