

Suggestion for Inclusion of Dispensers Trained from a Reputable Institution for Carrying out Drug Management Functions in Residential Care Homes (RCHs)

Background

Drug management is recognized as an important area of care in residential care homes as highlighted in Recommendation 14 of LC Paper No. CB(2)1221/19-20(01), the update of the *Guidelines on Drug Management in Residential Care Homes 2018* (院舍藥物管理指南 2018) and the *Code of Practice for Residential Care Homes* for both Elderly persons and Persons with Disabilities 2020 (院舍實務守則 2020).

Drug Preparation (備藥) by Staff with Adequate Training in Drugs & Drug use

Presently, nurse and health worker are the two categories of staff recognized as staff with relevant training for drug management in RCHs.

Can dispensers with a recognized training qualification also be formally included into the manpower scheme for RCHs? Training programs for both nurses and health workers consist of elements of drugs and drug use in addition to nursing care, but training on drugs and drug use is not the main focus of their training. The workload on care of the residents is heavy as it is in RCHs, which demands the energy and attention of nurses, health workers, and care workers. Drug management functions including receiving drugs dispensed from hospital pharmacies or private doctors, checking any changes in drug therapies during transition of care (such as follow-up medical appointment, discharge from hospital), preparation of records for preparation and medication administration (i.e., MAR) with dosing schedules, and preparation of drugs for administration according to dosing schedules for each resident require personnel with substantial training in drugs and drug use.

Graduates of higher diploma programs in dispensing from recognized institutions (benchmarked with the hiring requirement of Hospital Authority (HA) for dispensers) have completed a two-year, full-time study. Based on the program in the Hong Kong Institute of Vocational Education (IVE) of Vocational Training Council (VTC), the higher diploma program includes core subjects a total of 845 in-class contact hours covering human physiology, human disease, microbiology, pharmacology, drug therapeutics, pharmaceuticals (physicochemical principles underlining the design of drug products/dosage forms 劑型) as well as dispensing and compounding theory and skills of different drug products. The students also have to complete a minimum of 480 hours of on-site, clinical attachment in a hospital and/or clinic

pharmacy. They are trained to read and interpret doctor’s prescription and handling of different dosage forms. These graduates are equipped with the basic knowledge on the indications, contraindications, precautions for use, adverse drug effects, drug interactions, drug-food interactions of commonly used drugs. They are also trained to use different drug references, when needed, and to seek medical advice from pharmacists and doctors, when in doubt.

Dispenser as a professional is presently pursuing to be included in the Accredited Registers Scheme of Department of Health.

Conclusion

Dispensers should be considered in the formal manpower scheme in RCHs.

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Supplementary Information

Drug Management Issues Collected from Dispensers Working in RCHEs and RCHDs.

Common occurrence	Potential problem(s)
Care team members from other disciplines (such as nurse or health worker) would prepare the drugs for administration according to the dispensing labels.	An assumption that the drug order from the prescribing doctor is free of drug use issue, such as drug/drug class duplications, drug interactions, etc.
Team members fail to recognize drugs in the same, or related, drug class, which may lead to unnecessary duplication of drugs of the same class and failure to	Penicillin as a group, which contains drugs such as benzylpenicillin, cloxacillin, amoxicillin, and amoxicillin in Augmentin™ (a

<p>avoid a contraindicating drug for a resident with drug allergy history, G-6-DP deficiency, etc.</p>	<p>popular antibiotic brand that is a combination of amoxicillin and clavulanate). Penicillins are chemically similar to other antibiotics, which as cephalosporins. Cross-hypersensitivity is possible</p>
<p>Team members fail to check the generic name of the active ingredient(s) in the drug products, products from local pharmaceutical manufacturers and combination products. These drug products do not have a well-recognized brand name.</p>	<p>An assumption that drugs with different names on the dispensing label are two different drugs. Drug and/or therapeutic duplication can occur, especially the resident receives drugs from different doctors, doctors of different specialties and private doctors (polypharmacy). Paracetamol is one of the most common drugs that can accidentally linked to drug overdose.</p>
<p>Team members fail to properly schedule drugs not be administered at the same time due to adverse effects on absorption.</p>	<p>Drugs administered together may impair drug absorption, rendering failure of drug treatment. Calcium and iron supplement are two noticeable examples that may significantly reduce the absorption of many drugs, such as thyroxine, tetracycline antibiotics (including doxycycline), ciprofloxacin (& other -floxacin), alendronate, etc.</p>
<p>Team members fail to properly schedule drug administration with related to meal times. Some drugs should be administered on an empty stomach while others should be administered with food or within a specific time</p>	<p>Inappropriate timing of administration lead to impaired drug absorption. Drugs containing levodopa (as in Sinemet™) and many proton pump inhibitors (name ending with</p>

period after meal.	-prazole) should be taken on an empty stomach.
Team members fail to recognize certain drug products not to be crushed and possibility of alternatives.	Drug products with a special coating should not be crushed as the crushing would affect the drug release rate from such products, leading to unwanted consequences.
Team members fail to discern the proper use of as-needed drug orders.	Drugs are administered regularly regardless of the changing condition of the resident.

Selected Incidents

1. (VP & D) Near-miss case
 An original order of “benzhexol 2 mg twice daily as needed” was changed to “benzhexol 10 mg twice daily regularly”. The dispenser raised his concern to the visiting pharmacist upon receipt of the dispensed drug from a HA pharmacy.
2. (VP & D) Intervention for potential prevention of unnecessary adverse drug effects
 The doctor ordered both Augmentin and cloxacillin to a resident. The dispenser referred the case to the visiting pharmacist. A recommendation was to remove the cloxacillin order because of a therapeutic duplication guided by the culture & susceptibility results, but the doctor ignored the recommendation. The patient suffered from a severe diarrhea for 3 days before the antibiotic orders were modified.
3. (VP & D) Provision of medication review
 Request for medication review for a resident with an order for paracetamol 1 g three times daily when needed; the drug order was added upon discharge from hospital. The home manager was concerned about the dose not normally used. The total possible dose of 3 g paracetamol and 1 g per dose did not exceed the normal adult dosage range.
4. (VP) Prevention of adverse drug interaction
 Erythromycin 500 mg three times daily for an upper respiratory tract infection was ordered by the visiting medical officer. Erythromycin-warfarin interaction is well established; the patient was on warfarin, which the resident had been tightly monitored for her coagulation function for the past two months by CGAT doctor. The VP urged the nurse to contact the VMO by phone for a change of the antibiotic order. The VMO was unconvinced at first, but was persuaded eventually for the VP.

5. (VP) Intervention for reducing drug interaction and unnecessary use of high dose of a drug

The CGAT doctor was not convinced about the clinical significance of impairment of itraconazole (an antifungal drug) absorption when proton pump inhibitor is taken concomitantly. Fungal skin infections did not clear up after a prolonged itraconazole treatment. The VP tried many suggestions, including withholding the proton pump inhibitor while on itraconazole, change itraconazole to fluconazole, dietary modification, and attachment of relevant supporting medical articles to convince the doctor to prescribe the otherwise. The doctor's response was to order the maximum dose of itraconazole for an extended period of treatment repeatedly to different residents who were clinically indicated for itraconazole treatment.

The same prescribing pattern extended to a resident who was not on proton pump inhibitor; the resident needlessly taken a high dose of itraconazole until the VP reviewed the order during his weekly visit. The dose was reduced upon suggestion by VP.

6. (VP) Provision of medication review

The resident suffered from postural hypotension. Medication review by VP identified risperidone, diltiazem, and indapamide might contribute individually and when used in combination to the problem.

7. (VP) Prevention of occupational risk to staff administering a drug with teratogenic potential

Mycophenolate was ordered for a resident who required crushing of solid drugs for administration. The nursing staff were alerted by the VP so that the one pregnant nursing staff was refrained from handling the drug and the other staff should take contact precautions when preparing the drug for administration as there is a risk to the unborn child.

8. (VP) Rational use of laxative

A regular order for senna (a stimulant laxative for constipation) was recommended to switch to as-needed use by the VP after a medication review; the recommended was accepted by the doctor. The resident had been suffered from constipation and diarrhea on and off for two months. During this period, two different anti-diarrhea drugs were ordered and a cough product containing codeine (with a constipating effect). The recommendation was to give the nursing staff to give the drug only when the resident needed a laxative.

9. (VP) Prevention of drug duplication

A new order for Muzona™ 1% was ordered for a resident who had been applying terbinafine 1% cream for the past 6 weeks for skin fungal infection without improvement. The order was changed to tioconazole upon the VP's recommendation as Muzona™ is a

brand product that contains the same antifungal drug that had been shown to be ineffective.

10. (VP) Rational use of drug

Recommendation to put a condition to withhold gliclazide (an anti-diabetic drug that causes an increase in insulin secretion) when the patient is not willing to eat. The resident was prompt to hypoglycemic reactions.

11. (VP) Prevention of use of ineffective antibacterial drug

Ofloxacin ear drops was discontinued when the culture and susceptibility test shown that the bacteria isolated was resistant to levofloxacin. The recommendation was put forth with the explanation that ofloxacin is a racemic mixture and the levofloxacin is the active optical isomer.

12. (D) Proper scheduling of drug requiring dosing within a specific time with respect to meal time

Capecitabine 500 mg capsule 2 capsules twice daily to be taken within 30 minutes after meal. The dispenser re-scheduled the doses after reviewing the original dosing schedule by other care team member.

13. (D) Proper scheduling of drugs requiring proper spacing between 2 interacting drugs

Ciprofloxacin 250 mg Tablet 2 tablets twice daily and the care team member scheduled the doses with breakfast and supper while not noticing the resident was on calcium supplement taken with breakfast.

14. (D) Prevention of use of ineffective antibiotic

Suggestion by the dispenser to the doctor to switch an order of cefuroxime (Zinnat™) to Meropenem for a pseudomonal infection based on culture & susceptibility results. Cefuroxime is a second-generation cephalosporin that does not have anti-pseudomonal activities. The suggestion was accepted.

15. (D) Education for other care team members regarding a drug with different dosage forms and pharmaceutical manufacturers

Provision of education to nursing staff on bioequivalence of generic venlafaxine prolonged release 37.5 capsule and Effexor XR 37.5 mg capsule. The dispenser also reminded the nurse about the availability of venlafaxine 37.5 mg tablet, a different dosage form.

16. (D) Drug allergy

The dispenser notified the doctor about Thymol Gargle contains methyl salicylate as drug allergy to methyl salicylate was noted on the patient's record.

Hakkarainen KM. *Prevalence, nature and potential preventability of adverse drug events – a population-based medical record study of 4970 adults*. BJ Clin Pharmacol. 2014; 78(1): 170-83. [Sweden study]

- n = 4970; inpatient, outpatient specialty clinics, & primary care units
- 12.0% prevalence of adverse drug events & 5.6% preventable adverse drug events
 - 6.9% adverse drug reactions & 6.4% sub-therapeutic effects among the adverse drug events

Al-Jumaili AA & Doucette WR. *A systems approach to identify factors influencing adverse drug events in nursing homes*. JAGS. 2018; 66: 1420-7. [US study]

- Adverse drug reactions in nursing home residents
 - Risk factors among residents: age, frailty, disability, multiple chronic diseases, and multiple concurrent medications
 - Hypoglycemic reaction & anti-hypoglyemics
 - Risk of falls, cognitive impairment & extrapyramidal side effects with psychotropic drugs (antipsychotics, antidepressants)
 - Bleeding risk from warfarin (INR monitoring), aspirin, and other antiplatelet agents
- 6.13 Adverse drug event per 100 residents per resident-month {Other studies: 1.89 – 10.8 per 100 resident-month}
 - 51.1% Orthostatic & postprandial hypotension as a risk factor for falls
 - 94% residents on psychotropic (69.1% taking 1 or more; 20 cases of confusion, hallucination, delirium, dizziness, drowsiness; fall), antihypertensive, opioid, or antidiabetic medications
 - Dementia: Significant positive association with adverse drug event & risk of falls
 - Accessibility of a consultant pharmacist outside the visit days: **Negative association between NOT having access to pharmacist consultation and adverse drug event incident.**