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Supplementary Material

Medication incidents at supported disability accommodation (group homes) in Victoria, Australia: a retrospective audit of calls to a poisons information centre

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Supplementary Material File S1: WISE Medicines Care project

ALERT MEDICINES

Background

Most medicines have a reasonably wide margin of safety, which means that occasional missed doses or duplicated doses are not associated with major risk of an adverse outcome. However, for some medicines, accurate adherence to the prescribed dose regimen is important to ensure safety. These are typically medicines that have a relatively narrow margin of safety and/or medicines associated with potentially serious toxicities if taken incorrectly.

The list of medicines provided below has been compiled from existing lists of 'high alert' and 'high risk' medicines, and a review of the literature on medication safety in the community.[1-3] Inclusion of medicines in the list is based on a combination of:

1. Risk that a medicine administration error, such as wrong medicine or wrong dose, could be made (e.g. medicines with complex or variable dose regimens); and
2. Risk of an adverse outcome if the medicine is administered or taken incorrectly (e.g. medicines with a narrow therapeutic range).

The list is intended to assist nurses and case managers with planning the delivery of medicines management support.

Assessing risk

The list is a guide only. It is important to note that risk needs to be assessed on a case-by-case basis, because in some cases the medicines listed below may be lower risk (e.g. in a fit, clinically stable person with few comorbidities and a well-established, stable medicine regimen), and in some cases medicines not on this list might be high risk (e.g. in a clinically unstable person or when prescribed in high doses for a frail person).

If there is uncertainty about the risk of adverse outcomes if a client's medicines are taken or administered incorrectly, consultation with the client's GP is recommended. A Home Medicines Review may also assist with assessing a person's risk of medication errors.

Planning care

Depending on the clinical and social circumstances, people taking these medicines may be at higher risk of errors and adverse outcomes. Extra care and vigilance is required when planning and delivering medicines management support to these clients.

It may still be safe to delegate assistance with medicines administration or medicines prompting to a community care aid (CCA) or to the 'BEIP' program (for video conference support) if the client is clinically stable and the medicine regimen is well established and stable. The CCA should be advised of any important risks and adverse effects to look out for during client visits, and a nurse should visit the client at least once a week.

HIGH ALERT MEDICINES

Medicine name or class (examples)	**Potential consequence of medicine errors**
Anticoagulants, all routes (apixaban, dabigatrin, low molecular weight heparin, rivaroxaban, warfarin)[1-3]	Incorrect dosing may result in under- or over-anticoagulation, potentially leading to stroke or haemorrhage. With warfarin, variable doses and multiple strengths may increase risk of errors.
Chemotherapy agents, oral (e.g. cyclophosphamide, lenalidomide, mercaptopurine, hydroxyurea, temozolamide, thalidomide, tretinoin) (excluding hormonal agents such as tamoxifen)[1,2]	Complex dosing regimens may increase risk of errors. Excessive dosing may lead to potentially serious toxicities (e.g. neutropenia).
Immunosuppressant agents, oral (e.g. azathioprine, cyclosporin, leflunomide, methotrexate, tacrolimus)[1,2]	As above
Insulin, all formulations[1,3]	Variable doses and multiple dose-forms may increase risk of errors. Excessive doses may result in severe hypoglycaemia and death.
Lithium	Excessive dosing may result in toxicities such as blurred vision, diarrhoea, muscle weakness, ataxia, drowsiness, confusion, seizures.
Opioids, all formulations[1,3,4]	Excessive dosing may result in sedation, nausea, vomiting, dizziness, respiratory depression. Fentanyl patches in particular are associated with significant risk of adverse outcomes if not used appropriately.[4]

MODERATE ALERT MEDICINES

Medicine name or class (examples)	**Potential consequence of medicine errors**
Anti-infectives, oral and ocular[2,3]	Non-adherence (less than 80% adherence or incomplete course) may lead to treatment failure.
Anti-convulsants (e.g. carbamazepine, phenytoin, valproate)[1,2]	Excessive dosing may result in potentially serious toxicities (e.g. sedation, ataxia, blood dyscrasias). When used for seizure management, abrupt cessation may increase risk of seizures.
Anti-psychotics (e.g. chlorpromazine, haloperidol, risperidone, olanzapine, quetiapine)[2]	Excessive dosing may result in potentially serious toxicities (e.g. sedation, agitation, Parkinsonian symptoms, orthostatic hypotension)
Anti-retrovirals (e.g. efavirenz, lamivudine, raltegravir, ritonavir, combination products)[1]	High levels of adherence (>90%) are required for treatment to be effective.
Corticosteroids, oral (e.g. prednisolone)[2]	Excessive dosing may result in potentially serious toxicities (e.g. hyperglycaemia, muscle wasting, psychiatric effects). Abrupt cessation (after long-term use, >3 weeks) can result in adrenal crisis.
Digoxin[2]	Excessive dosing may result in potentially serious toxicities (e.g. anorexia, nausea, vomiting, visual disturbances, dizziness, bradycardia, arrhythmia)

Medicine name or class (examples)	**Potential consequence of medicine errors**
Glaucoma medicines	Non-adherence increases the risk of vision loss. Since glaucoma is usually asymptomatic and eye drops may be difficult to administer, poor adherence or ineffective technique is common.
Hypoglycaemic agents, oral (sulphonylurea class only, e.g. glibeclamide, gliclazide, glimepridine)[1]	Excessive dosing of sulphonylureas may result in hypoglycaemia (other classes of oral hypoglycaemic, such as metformin, usually only cause hypoglycaemia when used in combination with a sulphonylurea or insulin).
Loop diuretics (frusemide, bumetanide, ethacrynic acid)	Excessive dosing may lead to dehydration, electrolyte disturbance (eg hypokalaemia), hypotension and renal failure. When prescribed for heart failure, non-adherence may lead to exacerbation of symptoms.
Sedatives (e.g. benzodiazepines such as diazepam, oxazepam, temazepam; z-drugs such as zolpidem)	Excessive dosing may result in potentially serious toxicities (e.g. sedation, falls). Abrupt cessation after long term use may lead to withdrawal syndrome.
Theophylline[2]	Excessive dosing may result in potentially serious toxicities (e.g. seizures, arrhythmias)

References

1. Institute for Safe Medication Practices (ISMP). ISMP list of high-alert medications in community/ambulatory care. http://www.ismp.org/communityRx/tools/ambulatoryhighalert.asp
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