



WHICH MEDICINES ARE “TIME-CRITICAL”?

One of the recommendations to reduce medication errors and harm is to use the “five rights”: the right patient, the right drug, the right dose, the right route, and the **right time**.

*Why is the **right time** so important?
Which medicines are most important?*

Medicine doses are unintentionally delayed or missed for a variety of reasons. While many of these occurrences can be considered insignificant, there are **time-critical medicines** and **clinical conditions** where delays or omitted medicines can cause serious harm (including fatal outcome). Time variations (within a specified range) may be acceptable except for some very high priority medicines, which must be dosed without delay i.e. ‘time-critical’ medicines. These include STAT doses and medicines used in emergency situations. It may be easier to think about the actual condition being treated as well as the pharmacokinetics of the medicine, plus the potential implications of delaying or missing a dose (*examples below*).

Medicine Category	Examples	Possible effects of late or missed doses
Anticoagulants	Apixaban, dabigatran, enoxaparin heparin, rivaroxaban, warfarin	Deep vein thrombosis, pulmonary embolism
Anticonvulsants	Diazepam, levetiracetam, phenytoin, sodium valproate	Seizure activity, especially if omitted peri-operatively or if charted to relieve seizures
Antidotes (usually STAT order)	Acetylcysteine, calcium folinate, digoxin-specific antibody, naloxone, protamine	Toxicity, overdose related events
Antimicrobials	Intravenous antibiotics, antivirals, antifungals	Drug resistance, sepsis, prolonged infection, incorrect interpretation of therapeutic drug monitoring (TDM)
Bronchodilators	Salbutamol	Breathing issues
Cytotoxic cancer agents	Cyclophosphamide, etoposide, methotrexate, thalidomide	Incomplete remission, prolong hospital stay to finish course, exacerbation of symptoms
Hypoglycaemic agents	Immediate release sulfonylureas, e.g. gliclazide, rapid-acting insulin	Ketoacidosis, hyperglycaemia
Immunosuppressants	Ciclosporin, tacrolimus	Loss of immunosuppressant control, transplant rejection, exacerbation of symptoms
Parkinson Disease medicines	Bromocriptine, cabergoline, levodopa combinations	Exacerbation of symptoms, rigidity, falls
Psychotropics	Clozapine, lithium	Loss of symptom control

A universal list is not applicable or comprehensive because of diverse patient populations and the expanding market. ***Each health facility should have a specific policy around management of time-critical medicines. A local list of very high priority medicines and related conditions that carry very significant risks of death or severe patient harm if a single dose is omitted and delayed should be developed.*** Our UK colleagues have collated and shared resources to reduce the incidence of delayed or missed medicines [see [here](#)].

All health professionals have a role to play: but what can pharmacists do to assist prompt administration of time-critical medicines?

- Identify all of a patient's time-critical medicines
- Ensure each patient's medicines are readily available – e.g. non-formulary items may require special arrangements for supply
- Check in advance if a patient's medicine supplies are running low and ensure additional supply well before the time of administration
- Encourage prompt notification about unavailability of a medicine
- If a route of administration becomes unavailable, notify the prescriber and discuss alternative routes of administration well in advance of the medicine administration time
- Consult a Medicines Information Service for information about therapeutic alternatives
- If a patient is 'Nil By Mouth' check with the medical team if it is possible for them to be given their oral medicine
- If a time-critical medicine dose is missed, act immediately. Where appropriate, facilitate administration and encourage monitoring for adverse effects. The exact time of the late administration or reason for non-administration must be documented. Ensure the prescriber is also advised of any time-critical medicine events, and report in hospital incident reporting software if necessary.
- Ensure administration of time-critical medicines is not delayed during the discharge process

**Teams should plan ahead so that patients receive their medications on time.
Educate colleagues about commonly used time-critical medications.**

Further reading and resources

- [Specialist Pharmacist Service. Reducing harm from missed or omitted and delayed medicines in hospital. Tools to support local implementation. Updated 2018.](#)
- QLD Health. User Guide. "On the Dot" Time-Critical Medication List. 2018. Contact medicationsafety@health.qld.gov.au
- [SU Hospital NHS Found Trust. Policy For the Administration of Medicines/MMP003/ v3: The Critical Medicines List](#)
- [Graudins et al. Multicentre study to develop a medication safety package for decreasing inpatient harm from omission of time-critical medications. Int J Qual Health Care. 2015;27\(1\):67-74](#)
- [Howell T. Time critical: preventing avoidable deterioration in admitted patients with Parkinson's Disease. SHPA MM2018 conference](#)

MI Q&A is an initiative of the Medicines Information Leadership Committee of the Society of Hospital Pharmacists of Australia. MI Q&A aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications. The topics presented are based on frequently encountered medicines information requests made to Medicines Information centres and/or matters of current clinical importance. Note that any treatment decisions should be made with careful consideration of the individual clinical circumstances of each patient. Comments, contributions or suggestions are welcome. Please join the SHPA Medicines Information stream at: <https://www.shpa.org.au/join-interest-group> or email specialtypractice@shpa.org.au