AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

Principles for the safe selection and storage of medicines

Survey tool

July 2020

Contents

Principles for the safe selection and storage of medicines — overview

Organisation-wide principles

Governance

Suitable governance is in place for safe procurement of medicines (including look-alike sound-alike (LASA) medicines) and formulary decision-making.

Consumer participation

Patients (and their carers) are included when considering the risks and benefits of taking medicines (including LASA medicines) and are informed and educated about these risks.

Principles for application within pharmacy and clinical areas

1. Conduct proactive assessment of the risks associated with the selection and storage of medicines.
2. Include assessment of LASA medicine risk in checklists and when applying labels or alerts.
3. Provide a work environment that reduces the risks associated with the storage and selection of medicines.
4. Ensure clinician awareness and competency on the risks associated with incorrect selection and storage of medicines.
5. Use simulation when informing and educating clinicians about risks associated with incorrect selection and storage of medicines.
6. Monitor medicine use and related alerts or triggers for patient deterioration.
7. Apply and communicate formulary restrictions related to medicines.
8. Physically separate look-alike medicines that present risks associated with selection and storage.
9. Alter the appearance of packaging and/or labelling to emphasise the difference between look-alike medicines.
10. Implement practices (manual) or design features or warnings (electronic) to detect and prevent medicine selection errors.
11. Display medicines information in a consistent manner including medicine names and instructions for use.
12. Apply visual design technology to reduce the need for interpretation and risk of medicine selection errors.
13. Reduce the risk of medicine selection error through standardisation of processes, systems and technology.
14. Eliminate unnecessary steps in systems for the selection and storage of medicines.

Introduction

The survey tool provides Australian health service organisations (HSOs) with a set of 14 principles supported by a variety of risk reduction strategies. The tool should be used in conjunction with the ***Principles for the safe selection and storage of medicines – Guidance and survey tool***.

It is intended for use in hospitals by all clinicians involved in the medication management pathway, including those with governance responsibilities within the health service. The survey tool is also intended to be applied within pharmacy and ward storage environments.

The Australian Commission on Safety and Quality in Health Care (the Commission) wishes to acknowledge the contribution of members of the Health Services Medication Expert Advisory Group (HSMEAG) as well as the hospitals that participated in the pilot survey.

The survey tool format

The survey tool contains:

- Four implementation ratings to assess risk reduction strategies for safe storage and selection
- Practical examples of risk reduction strategies
- An action plan to inform quality improvement.

The four ratings are based upon the structure used within the Institute for Safe Medication Practices' (ISMP) Medication Safety Self Assessment® (MSSA) program:[1]

- Implemented everywhere
- Partially implemented
- Considered but not implemented
- Not considered or implemented.

When HSOs are completing the survey tool they may consider and mark any of the risk reduction strategies 'not applicable'. It is recommended that a short comment explaining this be included as relevant.

The survey tool contains a set of 14 principles supported by 91 risk reduction strategies. It also contains numerous practical examples to assist HSOs when assessing their medicine selection and storage risks.

HSOs are also expected to refer to and align their medication management approach to the safe selection and storage of medicines within the framework of the two organisation-wide principles: Governance and Consumer participation.

The tool includes an action plan section for HSOs to complete and for their medicines' governance group to monitor.

How to use the survey tool

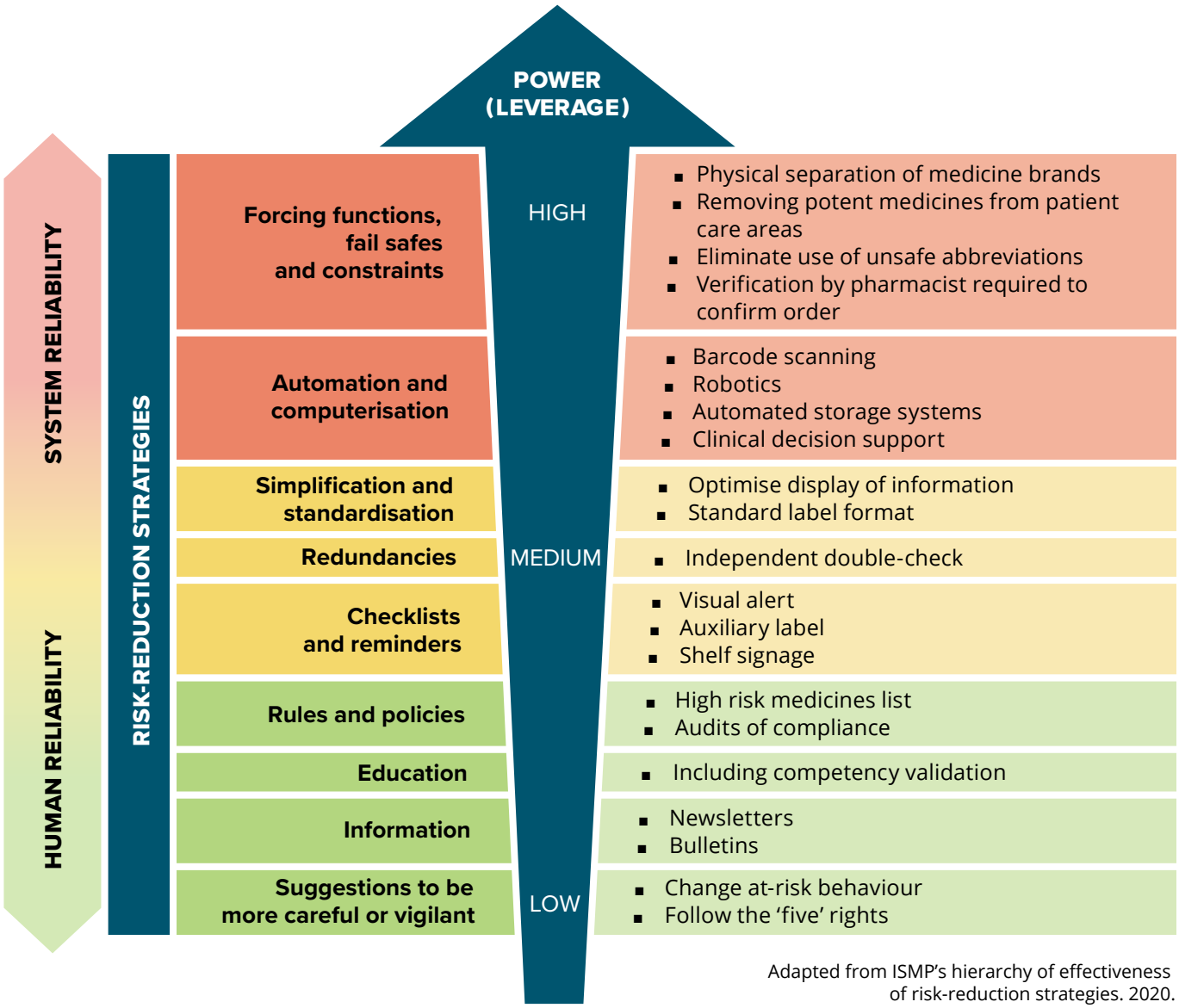
This survey tool aims to assist staff in Australian HSOs to take an active approach to the assessment of safe selection and storage of medicines. It is designed to be completed with input from relevant stakeholders including (but not limited to) representatives from pharmacy, medical and nursing.

Completion of the survey tool will support staff in Australian HSOs to assess medication management practices associated with the selection and storage of medicines and identify opportunities implementing suitable risk-reduction strategies.

Depending upon the results of this assessment, more powerful strategies may need to be considered to further enhance medication safety (see Figure 1).[2]

The outcomes and actions taken as a result of completing the survey tool may be used to demonstrate compliance with the National Safety and Quality Health Service (NSQHS) Medication Safety Standard: Action 4.14.[3] Additional applicable NSQHS Medication Safety Standard Actions include 4.1, 4.2 and 4.15.

Figure 1: Hierarchy (power) of risk-reduction strategies



Adapted from ISMP's hierarchy of effectiveness of risk-reduction strategies. 2020.

Survey tool

Applicable NSQHS standards: 4.1, 4.2, 4.14 and 4.15

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

1 Risk assessment

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
1.1 Perform proactive risk assessment on any or all of the following: ▪ new medicines for high risk, including LASA risk (for example, name and/or packaging similarity), before use ▪ new technology – for example, infusion pumps ▪ high risk processes involving medicines ▪ use of alternative medicines in the event of a medicine's shortage, including Special Access Scheme (SAS). **For example**, FMEA[4] or similar. See various related principles and strategies.	◯	◯	◯	◯	◯				
1.2 Use of **international or nationally developed and endorsed** assessment tools to assess or audit the safety of prescribing, dispensing, administration and storage systems for high risk medicines, including LASA medicines. **For example**, ensuring that Core Characteristics[5] that consider LASA medicines names, technology used, medicines standardisation, storage and distribution are assessed and implemented as relevant and applicable.	◯	◯	◯	◯	◯				
1.3 Use of **locally developed and endorsed** assessment tools to assess the safety of storage systems for high risk medicines, including LASA medicines. **For example**, assessment of the storage of neuromuscular blocking agents (NMBAs).[6]	◯	◯	◯	◯	◯				
1.4 Perform regular inspection of medicine storage to ensure pharmacy and ward storage systems comply with the risk reduction approach and strategies that have been implemented, for instance policy/procedure compliance. **For example**, separation/segregation; access restrictions; alert labels; Tall Man lettering.[7] **Note**: This may include audit of inventory (pharmacy and/or ward) that may prompt removal or deletion of a medicine.	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

2 Checklists and reminders

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
2.1 Apply the Commission's *National standard for user-applied labelling of injectable medicines, fluids and lines*.[8]	☐	☐	☐	☐	☐				
2.2 Use of a 'time out' checklist prior to a procedure that involves selection of a medicine, or to ensure the correct medicine has been administered. **For example**, use a cancer chemotherapy time out checklist, for instance, the eviQ *Antineoplastic drug time out checklist*[9]; apply the WHO (or ANZ edition) *Surgical Safety Checklist*.[10]	☐	☐	☐	☐	☐				
2.3 Reminders for patient monitoring built into EMM standard order sets and/or medicine treatment protocols.	☐	☐	☐	☐	☐				
2.4 Visual or audible alarms. **For example**, an alert generated by scanning a machine-readable code (for instance, a linear barcode) when a medicine is selected in error.	☐	☐	☐	☐	☐				

2 Checklists and reminders

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
2.5 Allergy records are available and considered in medicine selection and matching the correct medicine to avoid risk of patient harm from selection error. **For example**, completion of the Allergy/ADR box on the NSMC; allergy/ADR status recorded in EMM or alerted via red patient identification bracelets; allergy recording and documentation meets NSQHS Medication Safety Standard requirements – Actions 4.7 and 4.8.[3]	◯	◯	◯	◯	◯				
2.6 Allergy and medicine duplication alerts are integrated into all electronic systems in use. **For example**, Automated Dispensing Cabinets (ADCs); EMM; dispensing software and patient identification bracelets enabled with a machine-readable code (QR or linear barcode).	◯	◯	◯	◯	◯				
2.7 Use of procurement checklists[11,12] or assessments in facilities and/or tender evaluations that consider medication safety and risk of medicine selection errors and application of best practice labelling guidance.[13] **For example**, consider implications of: ■ LASA medicine names with suffixes that denote a modified release instead of an existing or listed immediate release medicine ■ differing indications for different brands of the same active ingredient ■ storage requirements for ready-made injectable solutions that could be mixed up, for instance, 100 mL minibags of 10 mmol potassium chloride to be differentiated from 100 mL minibags of sodium chloride 0.9% ■ the similar appearance of pre-filled syringes of a high risk medicine that could have devastating consequences if administered via the wrong route for example, vincristine for intravenous administration ONLY ■ storage requirements for ready-made epidural infusions.	◯	◯	◯	◯	◯				

2 Checklists and reminders

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
2.8 Use of a checklist or assessment process (similar to that described in 2.7) in procurement and evaluation of replacement stock when a **medicine shortage** occurs. **For example**, this may occur locally or via a state-wide process.	◯	◯	◯	◯	◯				
2.9 Apply restrictive practices within prescribing, dispensing and administration of replacement stock in response to a medicine shortage. **For example**, as part of a local or state-wide medicine-shortage management strategy.	◯	◯	◯	◯	◯				
2.10 Use of communication tools or resources (electronic or hard copy) as a ready reference for clinicians. **For example**, bulletins, posters or safety alerts on avoiding specific medicine formulation mix-ups, or prompts for differentiation, including LASA medicines.	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

3 Positive performance shaping factors

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
3.1 The physical design, layout and choice of medicine storage equipment and technology is conducive to safe selection, storage and preparation of medicines. **For example**, is uncluttered and well organised.[14] *Also refer to* Standardisation.	◯	◯	◯	◯	◯				
3.2 Use of 'Do not interrupt' interventions are in place consistent with the Commission's Evidence Briefing on *Interventions to reduce interruptions during medication preparation and administration*.[15] **For example**, quarantining medication administration rounds by using 'do not disturb' vests or signage; noise reduction via designated quiet zones; checklists; task allocation/responsibility for non-medication related enquiries, for instance, phone calls.[16] **Note**: There is limited evidence of the effectiveness if interventions to significantly reduce interruptions.[17] A 2017 Australian study reported on the evaluation of using 'do not disturb' signage to reduce non-medication related interruptions during medication administration.[18] Whilst the intervention was shown to be statistically significant the authors noted that the impact on error rates should be considered relative to the effectiveness of alternative interventions. *Also refer to* Standardisation.	◯	◯	◯	◯	◯				
3.3 Provide hands-on experience and competence assessment for clinicians involved in medication management in line with the role, authority and level of skill required.	◯	◯	◯	◯	◯				

3 Positive performance shaping factors

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
3.4 Invite clinicians involved in prescribing, dispensing, preparing (compounding) and administering (and monitoring the effects of) medicines to inform educational and interventional campaigns about potential risks and risk-reduction strategies. **For example**, informed by clinicians' experience with LASA and/or high risk medicines and how to influence practice change.	◯	◯	◯	◯	◯				
3.4 A positive organisational safety culture with ability to recognise, respond to, give feedback, and learn from adverse events (NSQHS Standards: Clinical governance standard[19]) **For example**, a culture that supports and empowers staff to recognise and challenge an illegible, ambiguous or conflicting medicine order that could result in patient harm.	◯	◯	◯	◯	◯				

Organisation name: ◯ **Pharmacy** ◯ **Clinical area/ward location** (describe): **Survey completed by** (enter name): **Date:**

4 Education and competency validation

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
4.1 Educate clinicians about how selection errors can happen, the steps that the organisation is taking to avoid these types of errors and clinicians' role in error-reduction. **For example**, potential for LASA errors if handwritten orders are not legible; all illegible orders are potential medication errors; emphasising the need to **read the medicine name and strength** rather than rely on package recognition. **Note**: Education needs to identify and address barriers to understanding, and highlight the need for clinicians to change practice.	◯	◯	◯	◯	◯				
4.2 Inform and educate clinicians involved in prescribing, dispensing and administering (and monitoring effects of) medicines about the consequences of confusing different formulations or medicine potency. **For example**, includes a focus on LASA and high risk medicines: lipid versus conventional parenteral formulation of amphotericin; morphine versus HYDROmorphone).	◯	◯	◯	◯	◯				
4.3 Alert, inform and educate clinicians involved in prescribing, dispensing and administering medicines when a new or alternative medicine has been added to the formulary and has been assessed as having a LASA selection risk.	◯	◯	◯	◯	◯				
4.4 Assess clinician competency and use results of competency assessment to identify and address barriers to understanding and need for a change in practice. **For example**, mandate essential medication safety training at intern orientation; conduct annual calculation assessments for nurses; random quizzes on strategies for safe selection and storage of medicines.	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

5 Situational awareness and critical thinking

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
5.1 Use simulation to expose and educate clinicians involved in prescribing, dispensing and administering LASA and high risk medicines about the potential risks and risk-reduction strategies.	☐	☐	☐	☐	☐				
5.2 Coach or instruct clinicians on specific techniques involved with the prescribing, dispensing, compounding or administration of LASA and high risk medicines.	☐	☐	☐	☐	☐				
5.3 Teach and encourage clinicians to be vigilant and seek advice on LASA risks prior to undertaking critical tasks involving high risk medicines or high risk techniques. **For example**, prescribing or selecting a high risk medicine; taking 'time out' prior to administration of intrathecal chemotherapy; responding to acute unexplained clinical deterioration.	☐	☐	☐	☐	☐				
5.4 Clinicians are involved in team 'huddles'[20,21] that include a focus on the potential risks and risk-reduction strategies associated with prescribing, dispensing, compounding or administration of medicines. For example, when a new or alternative LASA or high-risk medicine is added to formulary.	☐	☐	☐	☐	☐				

5 Situational awareness and critical thinking

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
5.5 Analyse and use system/technology 'override' data to identify potential risk from human factor[22,23] tendencies and inform clinician education and/or simulation. **For example**, workarounds or alert fatigue.[24]	◯	◯	◯	◯	◯				
5.6 Record and trend incidents and near misses involving LASA medicines, including 'override' data, associated with automated storage systems; EMM systems; infusion pumps.	◯	◯	◯	◯	◯				
5.7 Investigate trends in incident reports involving medicine selection or storage errors, and take action. **For example**, where LASA and high risk medicines[25,26] are implicated.	◯	◯	◯	◯	◯				
5.8 Monitor and respond to safety alerts and the environment (for instance, learning from others' reported experience[27]), for new medication safety warnings and use to inform educational and interventional campaigns. **For example**, new studies or literature; newsletters; quality improvement initiatives; medicine use or incident evaluation. *Also refer to* Education and competency validation.	◯	◯	◯	◯	◯				

Organisation name: ◯ **Pharmacy** ◯ **Clinical area/ward location** (describe): **Survey completed by** (enter name): **Date:**

6 Recovery and harm mitigation

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
6.1 Resuscitation (or reversal) protocols in place to guide clinicians for a range of high risk medicines or high risk techniques involving medicines. **For example**, how to recognise and treat local anaesthetic toxicity, for instance, if lignocaine 1% injection is mistaken for 0.9% sodium chloride; how to manage a wrong route administration of a medicine – intrathecal versus intravenous.	◯	◯	◯	◯	◯				
6.2 Patient monitoring, alerts or triggers used to detect irregularities or deterioration. **For example**, therapeutic drug monitoring; naloxone administration in response to opioid overdose; or unexplained respiratory depression due to administration of the wrong medicine or fluid.	◯	◯	◯	◯	◯				
6.3 Action taken if the patient expresses concern about a medicine or experiences unexpected symptoms. **For example**, include assessment of a LASA selection error to help determine causality and appropriate patient recovery.	◯	◯	◯	◯	◯				
6.4 Patients (and their carers) speak up, ask questions, are listened to and informed about the medicine's indication or purpose, potential risks and how these risks can be avoided, for instance, at the time of taking a best possible medication history, medication review and medication reconciliation (includes transition of care, i.e. at discharge). **For example**, to empower patients (NSQHS Standards: Partnering with consumer standard[28]) learn how to avoid potential medicine brand mix-ups (Coversyl versus Coumadin[29]); or how to recognise duplicated medicines (two different brands of same active ingredient). *Also refer to* Consumer participation.	◯	◯	◯	◯	◯				

Organisation name: ◯ **Pharmacy** ◯ **Clinical area/ward location** (describe): **Survey completed by** (enter name): **Date:**

7 Limit access or use

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
7.1 Restrict stock (imprest) of certain medicine concentrations, strengths, formulations in wards or clinical areas. **For example**, concentrated potassium salt ampoules are only available in ICU; neuromuscular blocking agents are only available in perioperative settings; individually dispense immediate release verapamil or diltiazem.	◯	◯	◯	◯	◯				
7.2 Individually dispense restricted or high risk medicines (concentrations, strengths, or formulations). **For example**, warfarin (Coumadin) which has been implicated in look-alike packaging-related dispensing errors[29]; special access scheme (SAS) medicines.	◯	◯	◯	◯	◯				
7.3 Restrict stock of liquid oral opioid medicines to certain clinical/ward locations. **For example**, individual doses of methadone liquid or single bottles of codeine phosphate solution.	◯	◯	◯	◯	◯				

7 Limit access or use

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
7.4 Limit the use to a single medicine or strength of a medicine. **For example**, 10 mmol potassium chloride in 100 mL minibags for intravenous administration.	◯	◯	◯	◯	◯				
7.5 Limit the range of stock (imprest) in clinical or ward locations. **For example**, imprest list of medicines is tailored to the specialty; only stock HYDROmorphone in specialist pain management or palliative care areas.	◯	◯	◯	◯	◯				
7.6 Place neuromuscular blocking agents (NMBAs) in separate containers or a locked lidded compartment/cubie in an automated storage system and only within limited clinical locations (for instance, operating theatre; anaesthetic bay; other perioperative settings).	◯	◯	◯	◯	◯				

7 Limit access or use

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
7.7 Prevent purchase of medicines with similar (look-alike) packaging or appearance. **Note**: This may not always be possible, for instance during a medicine shortage, and will require use of other strategies to avoid selection risk. *Also refer to* Risk assessment.	◯	◯	◯	◯	◯				
7.8 Criteria for limiting quantities of high risk medicines stocked in automated storage systems. **For example**, restocking at frequent, monitored intervals.	◯	◯	◯	◯	◯				
7.9 Prevent clinicians from returning unused medicine to automated storage systems.	◯	◯	◯	◯	◯				
7.10 Access controls on drawers, bins and compartments, including software restrictions and use of location lights or locks, are activated on automated storage systems.	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

8 Constraints, barriers and forcing functions

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
8.1 Physically separate different brands and strengths of medicines **in pharmacy**. **For example**, use shelf dividers; position on separate shelves.	◯	◯	◯	◯	◯				
8.2 Employ automated storage and dispensing technology **in pharmacy**. **For example**, automated dispensing systems or robotics.	◯	◯	◯	◯	◯				
8.3 Stock different strengths of known and potentially confusable medicines where a selection error could lead to significant patient harm. **For example**, morphine versus HYDROmorphone which is 5 to 7 times more potent than morphine). **Note**: This may not always be possible, for instance during a medicine shortage, and will require use of other strategies to avoid risk selection risk. *Also refer to* Risk assessment.	◯	◯	◯	◯	◯				

8 Constraints, barriers and forcing functions

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
8.4 Physically separate different brands and strengths of medicines **in clinical or ward storage locations** (imprest).	◯	◯	◯	◯	◯				
8.5 Physically separate different medicine concentrations, strengths and formulations (including immediate and delayed release).	◯	◯	◯	◯	◯				
8.6 Physically separate LASA medicines with the same indication or clinical use.	◯	◯	◯	◯	◯				
8.7 Employ automated storage technology **in clinical or ward storage locations**. **For example**, automated storage systems consistent with the Commission's Evidence Briefing on *Automated dispensing systems*[30] and adhere to storage safety.[31,32]	◯	◯	◯	◯	◯				

8 Constraints, barriers and forcing functions

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
8.8 Use algorithms to load automated storage systems to ensure LASA medicines are separated.	◯	◯	◯	◯	◯				
8.9 Use automated storage systems that limit the access to selection of one medicine and a single strength and formulation.	◯	◯	◯	◯	◯				
8.10 Avoid placement of look-alike medicines within the same multiple-compartment/cubie (open matrix) drawer.	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

9 Differentiate items

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
9.1 Adopt the Commission's *Guidelines for on-screen display of medicines information*[33] in all digital technology for medication management (in particular, prescribing, dispensing, administration and automated storage systems) **For example**, use Tall Man lettering[7] or configure EMM systems to separate LASA medicine names with a space in drop down selection menu. *Also refer to* Optimise display of medicines information.	◯	◯	◯	◯	◯				
9.2 Alter the appearance of LASA medicine names on shelving and stock containers. **For example**, using Tall Man lettering[7]; colour[34,35]; font size or bolding.	◯	◯	◯	◯	◯				
9.3 Alter the appearance of LASA medicine names on dispensing labels. **For example**, using Tall Man lettering[7]; colour[34,35]; font size or bolding.	◯	◯	◯	◯	◯				

9 Differentiate items

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
9.4 For LASA medicines alter the appearance by giving the active ingredient (approved or generic) name more prominence than the brand name on dispensing labels.[36,37]	◯	◯	◯	◯	◯				
9.5 Apply ancillary labels alerting clinicians of high risk and potential selection error to the original look-alike medicine packaging and dispensed medicines. **For example**, apply cautionary advisory labels[38]; or apply locally designed labels to differentiate various strengths of a single medicine.	◯	◯	◯	◯	◯				
9.6 Use standardised storage/signage labels or alerts to itemise/organise medicine storage areas. **For example**, uniquely labelled storage bins; designated and standardised trolleys and layout for resuscitation medicines.	◯	◯	◯	◯	◯				

9 Differentiate items

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
9.7 Medicines remain in original containers/packaging. **For example**, avoid potential for look-alike selection error of tablets or capsules in identical foil packaging; or mix-up of ampoules/vials of similar size and volume. **Note**: Original containers include important storage information, for instance, whether the medicine needs to be protected from light.	◯	◯	◯	◯	◯				
9.8 Use equipment that will differentiate a medicine and help to ensure it is administered via the correct route: orally versus intravenous, or intravenous versus intrathecal/epidural. **For example**, use of oral dispensers/syringes to support delivery of oral medicines via the oral route and prevent accidental parenteral administration; use of neural connector devices that comply with ISO 80369-6:2016 to support appropriate administration of neural medicines.[39]	◯	◯	◯	◯	◯				
9.9 Prescribe LASA medicines using both the active ingredient (approved or generic) and brand names. **For example**, consistent with active ingredient prescribing requirements.[36,37]	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

10 Add redundancy

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
10.1 Employ independent second check (manual) for high risk or LASA medicines, or high risk techniques involving medicines. **For example**, consistent with the Commission's Evidence Briefing on *Double-checking medication administration*.[40] **Note**: There are various approaches to double-checking. Clarity is required in health service procedures.[41,42,43]	◯	◯	◯	◯	◯				
10.2 Employ technology to conduct checks; to restrict access; or to provide decision-support. **For example**, use machine-readable (for instance, a linear barcode) scanning[44]; electronic approval; electronic prescribing; electronic administration.[45]	◯	◯	◯	◯	◯				
10.3 Process for verbal or telephone orders (which should be limited) includes a second check. **For example**, by repeating the order to another clinician; by incorporating spelling the medicine name (for sound-alike names in particular) and stating the indication.	◯	◯	◯	◯	◯				

10 Add redundancy

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
10.4 Employ technology to conduct checks to verify the selection of the correct medicine during dispensing according to the Pharmacy Board of Australia (PBA) Guidelines for Dispensing of Medicines.[46] **For example**, use machine-readable (for instance, a linear barcode) scanning.[44]	◯	◯	◯	◯	◯				
10.5 Employ technology to conduct checks during administration to prevent wrong medicine selection or administration (including wrong route) errors. **For example**, use machine-readable (for instance, a linear barcode) scanning.[44]	◯	◯	◯	◯	◯				
10.6 Employ technology to conduct checks when restocking automated storage systems. **For example**, use machine-readable (for instance, a linear barcode) scanning.[44]	◯	◯	◯	◯	◯				
10.7 Use of a witness 'signature' in an automated storage system to allow access to restricted medicines. **For example**, schedule 8 medicines.	◯	◯	◯	◯	◯				

10 Add redundancy

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
10.8 Check of appropriateness of dose (and indication) when dispensing a high risk or LASA medicine, for instance, when dispensing a monoclonal antibody. **For example**, application of the Commission's Evidence Briefing on *Double-checking medication administration*.[40]	◯	◯	◯	◯	◯				
10.9 Print instructions on medicine dispensing labels for LASA medicines that prompt a second check. **For example**, 'PLEASE CHECK CAREFULLY – medicine with similar name or appearance'.	◯	◯	◯	◯	◯				
10.10 Require the indication for a medicine to be on the national standard medication chart(s) and included within EMM or electronic prescribing systems, **ensuring visibility** at time of dispensing and administration. *Also refer to* Optimise display of medicines information.	◯	◯	◯	◯	◯				

Organisation name: ◯ **Pharmacy** ◯ **Clinical area/ward location** (describe): **Survey completed by** (enter name): **Date:**

11 Optimise display of medicines information

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
11.1 Adopt the Commission's *Guidelines for on-screen display of medicines information*[33] in all digital technology for medication management (in particular, prescribing, dispensing, administration and automated storage systems). *Also refer to* Differentiate items.	◯	◯	◯	◯	◯				
11.2 Document all the details required on the national standard medication chart(s) or prescription when prescribing. This includes where EMM or electronic prescribing systems are implemented.	◯	◯	◯	◯	◯				
11.3 Include medication safety considerations in the procurement process[11,12], including the risk of LASA confusion with the appearance of medicines already listed on formulary. **For example**, for name and/or packaging similarity.	◯	◯	◯	◯	◯				

11 Optimise display of medicines information

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
11.4 Use alerts within digital systems (for instance EMM) to remind prescribers, dispensers and those administering medicines of potential LASA risks.	◯	◯	◯	◯	◯				
11.5 Consider potential alert fatigue (as well as override potential) when developing criteria for LASA medicine alerts that focus on greater risk of patient harm.[24]	◯	◯	◯	◯	◯				

Organisation name: ◯ **Pharmacy** ◯ **Clinical area/ward location** (describe): **Survey completed by** (enter name): **Date:**

12 Use of affordances

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
12.1 Medicine labels present the medicines information in the same manner as the on-screen order. **For example**, the pharmacy dispensing label on the medicine container matches the presentation of the EMM medicine order that a clinician refers to when selecting a medicine for administration.	◯	◯	◯	◯	◯				
12.2 Medicine storage systems (for instance, shelving, labelling and stock organisation) are purpose-designed, incorporate consistent features and layout, and are replicated within each ward location. **For example**, anaesthetic trolleys are set up in an identical and systematic manner to promote familiarity, safe selection and access to high risk and look-alike medicines.[47,48]	◯	◯	◯	◯	◯				

Organisation name: ◯ **Pharmacy** ◯ **Clinical area/ward location** (describe): **Survey completed by** (enter name): **Date:**

13 Standardise

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
13.1 Use evidence-based and standardised order sets within electronic medication management (EMM) systems.[49] **For example**, adoption of EviQ protocols[50,51] within chemotherapy-related EMM systems.	◯	◯	◯	◯	◯				
13.2 Standardise the available medicine formulations in ready-to-use concentrations and quantities that are condition-specific. **For example**, pack sizes of opioids that reflect expected dosing and duration of treatment; pre-mix isotonic fluid containing 10 mmol potassium chloride per 100 mL for peripheral electrolyte replacement in diabetic ketoacidosis.	◯	◯	◯	◯	◯				
13.3 Apply a standardised format for dispense labelling.[52]	◯	◯	◯	◯	◯				

13 Standardise

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
13.4 Standardised procedures for restocking imprest storage, including automated storage systems that limit process variation and include a requirement for labels on medicine packaging to be clearly visible. **For example**, face forward on shelves or face up in drawers; use machine-readable (for instance, a linear barcode) technology to scan every individual pack of a look-alike medicine when loading automated storage systems.	◯	◯	◯	◯	◯				
13.5 A standardised approach to the medicines storage system(s) and preparation areas is employed throughout clinical and ward locations. The approach is consistent with requirements of MSSA[5] Core Characteristic 12: that medicines are prescribed, prepared, dispensed and administered within a safe workflow and physical environment that offers adequate space and lighting to allow clinicians to remain focused without distraction. **For example**, space and layout for medicines that is uncluttered and a dedicated work area that is free of distraction and noise.	◯	◯	◯	◯	◯				
13.6 Procedures for dispensing medicines (including LASA and high risk medicines) are defined and disciplined and afford a sequential process for selection, matching, dispensing and labelling, and include redundancy measures. *Also refer to* Add redundancy.	◯	◯	◯	◯	◯				
13.7 Source commercially available products in the most ready-to-use formulation (according to TGA[53] and Pharmacy Board of Australia (PBA) codes, guidelines and policies[46]). **For example**, specialised and complex sterile products that are manufactured in a TGA-approved or licenced facility.	◯	◯	◯	◯	◯				

Organisation name: ☐ **Pharmacy** ☐ **Clinical area/ward location** (describe): ☐ **Survey completed by** (enter name): ☐ **Date:** ☐

14 Simplify

Risk reduction strategy	Implemented everywhere	Partially implemented	Considered but not implemented	Not considered or implemented	Not applicable	Comments and actions (if applicable)	To be actioned by	Date when actions are due for completion	Date implemented everywhere (if applicable)
14.1 Dispense commercially available products or compounded medicine(s) in the most ready-to-use formulation (according to TGA[53] and Pharmacy Board of Australia (PBA) codes, guidelines and policies[46]). **For example**, total parenteral nutrition solutions that do not require any further manipulation in pharmacy OR by clinicians who administer.	◯	◯	◯	◯	◯				
14.2 Use integrated electronic medication management (EMM) systems to eliminate risk of transcription errors.	◯	◯	◯	◯	◯				
14.3 Use or apply 'closed-loop' strategies within the medication management system. **For example**, seamless integration of EMM, dispensing and automated storage systems.[54,55]	◯	◯	◯	◯	◯				

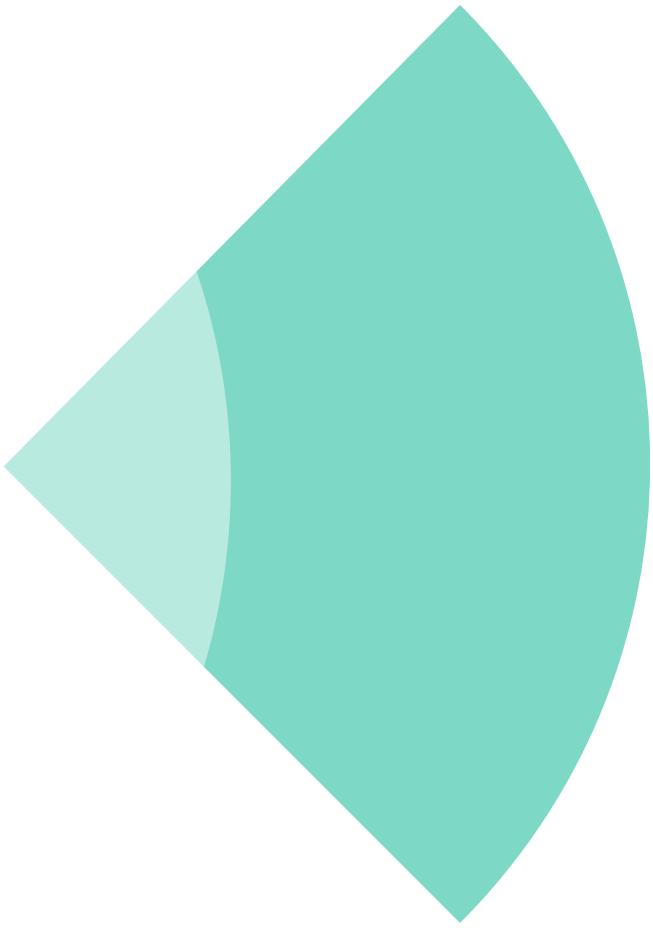
References

1. Institute for safe medication practices (ISMP). ISMP Medication Safety Self Assessment® (MSSA) program. Available from: **www.ismp.org/self-assessments**
2. Institute for Safe Medication Practices (ISMP). Acute Care ISMP Medication safety alert. Volume 25 Issue 11. June 4 2020. Figure 1. ISMP's hierarchy of effectiveness of risk-reduction strategies. Available from: **www.ismp.org/acute-care/medication-safety-alert-june-4-2020**
3. Australian Commission on Safety and Quality in Health Care (ACSQHC). National safety and Quality Health Service (NSQHS) Standards: Medication Safety Standard. ACSQHC. November 2017. Available from: **www.nationalstandards.safetyandquality.gov.au/4.-medication-safety**
4. Institute for Healthcare Improvement. Interactive Tools. Failure Modes and Effects Analysis (FMEA) Tool can be accessed at: **app.ihi.org/Workspace/tools/**
5. Clinical Excellence Commission (CEC). Medication Safety Self Assessment. Available from: **www.cec.health.nsw.gov.au/patient-safety-programs/medication-safety/mssa**
6. Victorian Therapeutic Advisory Group (VicTAG). Assessment tool: Safe Management of Neuromuscular Blocking Agents (NMBAs) in Victorian Hospitals. 2019. Available from: **www.victag.org.au/programs/safe-management-of-neuromuscular-blocking-agents**
7. Australian Commission on Safety and Quality in Health Care. National Tall Man Lettering List. ACSQHC. Sydney. Australia. 2017. Available from: **www.safetyandquality.gov.au/our-work/Medication-safety/Safer-naming-labelling-and-packaging-of-medicines/National-Tall-Man-Lettering-List/**
8. Australian Commission on Safety and Quality in Health Care. National standard for user-applied labelling of injectable medicines fluids and lines. ACSQHC. Sydney. Australia. 2015. Available from: **www.safetyandquality.gov.au/our-work/Medication-safety/Safer-naming-labelling-and-packaging-of-medicines/National-Standard-for-User-applied-Labelling-of-Injectable-Medicines-Fluids-and-Lines/**
9. eviQ Antineoplastic drug timeout checklist. NSW Government. Available from: **www.eviq.org.au/clinical-resources/assessment-tools/6-antineoplastic-drug-time-out-checklist**
10. Australian Commission on Safety and Quality in Health Care (ACSQHC). Surgical safety checklist. Available from: **www.safetyandquality.gov.au/our-work/patient-identification/patient-procedure-matching-protocols/surgical-safety-checklist/**
11. Graudins LV, Treseder R, Hui C, Samuel TL, Dooley M. A proactive quality strategy to decrease the risk of error associated with medication procurement. J Pharm Pract Res. 2016,46:145–151 (doi:10.1002/jppr.1181)
12. UKMi product assessment tool (developed as a quality assurance tool for use by Medication Safety Officers and others seeking to improve the safe use of individual products within the NHS) Available from: **www.sps.nhs.uk/articles/ukmi-product-assessment-tool/**
13. Therapeutic Goods Administration (TGA). Medicine labels: Guidance on TGO 91 and TGO 92. Recommendations and best practice. Available from: **www.tga.gov.au/book-page/3-recommendations-and-best-practice**
14. Institute for safe medication practices (ISMP). ISMP. Safe practice environment chapter proposed by USP. Available from: **www.ismp.org/resources/safe-practice-environment-chapter-proposed-usp**
15. Evidence Briefings on Interventions to Improve Medication Safety: Interventions to reduce interruptions during medication preparation and administration – August 2013. Available from: **www.safetyandquality.gov.au/wp-content/uploads/2013/12/Evidence-briefings-on-interventions-to-improve-medication-safety-Reducing-interruptions-during-medication-preparation-and-administration-PDF-1.2MB.pdf**
16. Institute for safe medication practices (ISMP). ISMP. Side tracks on the safety express: Interruptions lead to errors and unfinished … Wait, what was I doing? Available from: **www.ismp.org/resources/side-tracks-safety-express-interruptions-lead-errors-and-unfinished-wait-what-was-i-doing**
17. Raban M and Westbrook J. Are interventions to reduce interruptions and errors during medication administration effective?: a systematic review. BMJ Qual Saf. 2014;23:414–421. **www.ncbi.nlm.nih.gov/pmc/articles/PMC3995243/**
18. Westbrook J, Li L, Hooper T, Raban M, Middleton S, Lehnbom E. Effectiveness of a 'Do not interrupt' bundled intervention to reduce interruptions during medication administration: a cluster randomised controlled feasibility study. BMJ Qual Saf. 2017;26(9):734–742. **www.ncbi.nlm.nih.gov/pmc/articles/PMC5574391/**
19. Australian Commission on Safety and Quality in Health Care (ACSQHC). National safety and Quality Health Service (NSQHS) Standards: Clinical governance. ACSQHC. 2017. Available from: **nationalstandards.safetyandquality.gov.au/1.-clinical-governance**
20. Institute for Healthcare Improvement (IHI).Tools: Huddles. Available from: **www.ihi.org/resources/Pages/Tools/Huddles.aspx**
21. Clinical Excellence Commission (CEC). Safety Huddles. Implementation Guide and other tools. Available from: **www.cec.health.nsw.gov.au/improve-quality/Safety-Fundamentals-for-Teams/safety-huddles**
22. Royal College of Nursing (UK). Patient Safety and Human Factors: Patient safety interventions. Available from: **www.rcn.org.uk/clinical-topics/patient-safety-and-human-factors/professional-resources**
23. Baysari MT, Clay-Williams R, Loveday T (ed). A Human Factors Resource for Health Professionals and Health Services Staff. 2019. Produced by the Human Factors and Ergonomics Society of Australia, the Australian Institute of Health Innovation, Macquarie University, The University of Sydney and the NSW Clinical Excellence Commission. Available from: **www.ergonomics.org.au/documents/item/630**
24. Westbrook J, Baysari M. Nudging hospitals towards evidence-based decision support for medication management. MJA. 2019;210(6 Suppl):S22–24. **onlinelibrary.wiley.com/doi/full/10.5694/mja2.50028**
25. Australian Commission on Safety and Quality in Health Care (ACSQHC). High Risk Medicines. Available from: **www.safetyandquality.gov.au/our-work/medication-safety/high-risk-medicines/**

26. Institute for safe medication practices (ISMP). ISMP's List of High-Alert Medications in Acute Care Settings. 2018. Available from: **www.ismp.org/recommendations/high-alert-medications-acute-list**
27. Pharmacy Practice News Special Edition. ISMP. Medication errors: The year in review. 2019. Available from: **www.pharmacypracticenews.com/download/MedErrors_PPNSE0919_WM.pdf**
28. Australian Commission on Safety and Quality in Health Care (ACSQHC). National safety and Quality Health Service (NSQHS) Standards: Partnering with consumers. ACSQHC. 2017. Available from: **www.safetyandquality.gov.au/standards/nsqhs-standards/partnering-consumers-standard**
29. Pharmaceutical Defence Limited (PDL). Practice alert. Dispensing errors – wrong medication /wrong strength. 14 December 2016. Available from: **www.pdl.org.au/dispensing-errors-wrong-medication-wrong-strength**
30. Evidence Briefings on Interventions to Improve Medication Safety: Automated dispensing systems – June 2013. Available from: **www.safetyandquality.gov.au/wp-content/uploads/2013/12/Evidence-briefings-on-interventions-to-Improve-medication-safety-Automated-dispensing-systems-PDF-832KB.pdf**
31. American Society of Health-System Pharmacists (ASHP). Guidelines on the safe use of Automated Dispensing Devices. AJHP. 2010;67(6): 483–490. **doi.org/10.2146/sp100004**
32. Institute for Safe Medication Practices (ISMP) Canada. Safety Bulletin: Automated dispensing cabinets in the Canadian environment. June 2007. Available from: **www.ismp-canada.org/download/safetyBulletins/ISMPCSB2007-03ADCs.pdf**
33. Australian Commission on Safety and Quality in Health Care. National guidelines for on-screen display of medicines information. ACSQHC. Sydney. Australia. 2017. Available from: **www.safetyandquality.gov.au/our-work/Medication-safety/Electronic-medication-management/National-Guidelines-for-On-Screen-Display-of-Medicines-Information/**
34. Health Canada. Good Label and Package Practices Guide for Prescription Drugs. 2016. Available from: **www.canada.ca/en/health-canada/services/drugs-health-products/reports-publications/medeffect-canada/good-label-package-practices-guide-prescription-drugs.html?id=2934**
35. Vision Australia. Colour Contrast Analyser. Available from: **www.visionaustralia.org/services/digital-access/resources/colour-contrast-analyser**
36. National Health (Pharmaceutical Benefits) Amendment (Active Ingredient Prescribing) Regulations 2019. Available from: **www7.austlii.edu.au/cgi-bin/viewdb/au/legis/cth/consol_reg/nhbr2017445/**
37. National Health (Pharmaceutical Benefits) Amendment (Active Ingredient Prescribing) Regulations 2019. Explanatory Statement. Available from: **classic.austlii.edu.au/au/legis/cth/num_reg_es/nhbaipr2019201901312799.html**
38. Sansom LN, ed. Australian pharmaceutical formulary and handbook. 24th ed. Canberra: Pharmaceutical Society of Australia (PSA); 2018.
39. Australian Commission on Safety and Quality in Health Care (ACSQHC). ISO 80369-6:2016 neural connector devise to reduce misconnection errors: Guidelines for implementation in Australia. Available from: **www.safetyandquality.gov.au/publications-and-resources/resource-library/iso-80369-62016-neural-connector-devices-reduce-misconnection-errors-guidelines-implementation-australia**
40. Evidence Briefings on Interventions to Improve Medication Safety: Double-checking medication administration – August 2013. Available from: **www.safetyandquality.gov.au/wp-content/uploads/2013/12/Evidence-briefings-on-interventions-to-improve-medication-safety-Double-checking-medication-administration-PDF-888KB.pdf**
41. Institute for Safe Medication Practices (ISMP). Medication Safety Alert. Independent double checks: Worth the effort if used judiciously and properly. ISMP. June 2019. Available from: **www.ismp.org/resources/independent-double-checks-worth-effort-if-used-judiciously-and-properly**
42. Koyama AK, Maddox CSS, Li L, Bucknall T, Westbrook JL. Effectiveness of double checking to reduce medication administration errors: a systematic review. BMJ Quality and Safety. 2019;0:1–9.
43. Institute for Safe Medication Practices (ISMP). Medication Safety Alert. Published review of independent double checks shouldn't dissuade providers from using them judiciously. ISMP. September 2019. Available from: **www.ismp.org/resources/published-review-independent-double-checks-shouldnt-dissuade-providers-using-them**
44. Evidence Briefings on Interventions to Improve Medication Safety: Bar code medication administration systems – June 2013. Available from: **www.safetyandquality.gov.au/wp-content/uploads/2013/12/Evidence-briefings-on-interventions-to-improve-medication-safety-Bar-code-administration-systems-PDF-620KB.pdf**
45. Evidence Briefings on Interventions to Improve Medication Safety: Electronic medication administration records – September 2013. Available from: **www.safetyandquality.gov.au/wp-content/uploads/2013/12/Evidence-briefings-on-interventions-to-improve-medication-safety-Electronic-medication-administration-records-PDF-1.35MB.pdf**
46. Pharmacy Board of Australia. Codes, guidelines and policies. Available from: **www.pharmacyboard.gov.au/Codes-Guidelines.aspx**
47. Australia and New Zealand College of Anaesthetists (ANZCA). Guidelines for the safe management and use of medications in anaesthesia. 2020. Available from: **www.anzca.edu.au/documents/ps51-2009-guidelines-for-the-safe-administration-o**
48. Graudins LV, Downey G, Bui T, Dooley M. Recommendations and Low-Technology Safety Solutions Following Neuromuscular Blocking Agent Incidents. Joint Commission Journal on Quality and Patient Safety. 2016:42(2);86–91. DOI: **doi.org/10.1016/S1553-7250(16)42010-6**
49. Australian Commission on Safety and Quality in Health Care. Electronic medication management systems – A guide to safe implementation. 3rd Edition. ACSQHC. Sydney. Australia. 2019. Available from: **www.safetyandquality.gov.au/our-work/Medication-safety/Electronic-medication-management/Electronic-Medication-Management-Systems-A-Guide-to-Safe-Implementation/**
50. Cancer Institute NSW. eviQ: Cancer treatment protocols. Available from: **www.cancer.nsw.gov.au/how-we-help/diagnosis-and-treatment/cancer-treatment-and-care/how-does-eviq-support-cancer-treatment-in-nsw**
51. Australian Commission on Safety and Quality in Health Care (ACSQHC). NSQHS Standards User Guide for Medication Management in Cancer Care. Sydney.

Australia. 2020. Available from: **www.safetyandquality.gov.au/publications-and-resources/resource-library/nsqhs-standards-user-guide-medication-management-cancer-care**

52. Aslani P, et al. Active ingredient or brand name? Do people know? Presentation at the 78th FIP World Congress of Pharmacy and Pharmaceutical Sciences; 2018 Sept 2–6; Glasgow (UK): International Pharmaceutical Federation.
53. Therapeutic Goods Administration (TGA). GMP information for manufacturers of compounded medicines and DAAs. **www.tga.gov.au/publication/gmp-information-manufacturers-compounded-medicines-and-daas**
54. Austin JA, Smith IR, Tarig A. The impact of closed-loop electronic medication management on time to first dose: a comparative study between paper and digital hospital environments. IntJPharmPract. 2018 Dec;26(6):526–533. **www.ncbi.nlm.nih.gov/pubmed/29356171**
55. The Society of Hospital Pharmacists of Australia. (SHPA). Position statement: Closing the loop of medication management in hospitals to improve patient safety with barcoding technology on unit dose packaging. June 2019. Available from: **www.shpa.org.au/sites/default/files/uploaded-content/website-content/Fact-sheets-position-statements/position_statement_-_unit_dose_packaging.pdf**



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