High-Alert Medications

Purpose:

A policy to support LTC practitioners in understanding the risks associated with high-alert medications and implementing targeted safeguards.

High-alert medications are those that carry an increased risk of resident harm when used incorrectly. Although mistakes may or may not be more common with these medications, the consequences of an error with these medications can be devastating to residents, due to the pharmacologic properties of the medications (e.g., anticoagulants, insulin, opioids).

(See page 8 for a Glossary of Key Terms)

Scope:

This model policy applies to all long-term care practitioners involved in prescribing, preparing, administering, monitoring and/or other aspects of high-alert medication management. A key recommended safeguard is the use of independent double checks for selected high-alert medications. These checks have been shown to reduce the likelihood of errors reaching residents. [1] [2] Other safeguards for high-alert medications include targeted education on the pharmacologic properties and appropriate dosing, limiting the number of medications used from particular classes to optimize knowledge and awareness, and implementation of technology, such as bar coding.

Overview of Process:

A. High-Alert Medication List for the Home

The Medication Safety Committee identifies high-alert medications in routine use at the Home. The following table, adapted from the ISMP US High-Alert List[3], is provided as a guide. (Note that this is not an all-inclusive list; consideration and addition of other medications that have been involved in incidents where harm resulted is important.)

[1] Lowering the Risk of Medication Errors: Independent Double Checks. ISMP Canada Safety Bulletin 2005; 5(1). Available from: https://www.ismp-canada.org/download/safetyBulletins/ISMPCSB2005-01.pdf

[2] Independent Double Checks: Worth the Effort if Used Judiciously and Properly. ISMP Medication Safety Alert! June 6, 2019. Available from: https://www.ismp.org/resources/independent-double-checks-worth-effort-if-used-judiciously-and-properly

[3] High-Alert Medications in Long-Term Care Settings, 2021. [cited 2021 Aug 26]

Table A: High-Alert List (Adapted from ISMP US)

Medication Class/ Category	Medication Examples	Rationale for Inclusion:
Anticoagulants, oral and parenteral	*Oral:* apixaban, dabigatran, edoxaban, rivaroxaban, warfarin *Parenteral:* heparin, dalteparin, enoxaparin, tinzaparin	Risk of serious bleeding Need for systematic monitoring (warfarin)
Chemotherapeutic agents, excluding hormonal therapy		High risk of harm due to incorrect dose or incorrect patient
Hypoglycemic agents, oral and parenteral	*Oral:* gliclazide, glimepiride, glipizide, glyburide *Parenteral:* Insulins, all formulations and strengths, with special attention to concentrated insulins (i.e., U-200, U-300, U- 500)	Risk of hypoglycemia
Immunosuppressants	azathioprine, cyclosporine, tacrolimus	Risk of harm through omission or administration to incorrect resident
Opioids, all routes of administration (oral, sublingual, parenteral, transdermal) including liquid concentrates, immediate- and sustained-release formulations, and combination products with another drug	codeine, fentanyl, hydromorphone, oxycodone, tramadol	Risk of respiratory depression

Specific Medications	Rationale for Inclusion
Concentrated opioid solution, oral (e.g., hydromorphone, morphine)	Risk of overdose
Digoxin, parenteral and oral	Narrow therapeutic window
Epinephrine, intramuscular and subcutaneous	Risk of overdose
Insulin U-500	Risk of overdose
Methotrexate, oral and parenteral, nononcologic use	Risk of daily dosing instead of intended weekly dosing, with associated toxicity
Sacubitril and valsartan (Entresto)	Risk of duplicate therapy with ACE inhibitor (e.g., perindopril, ramipril) and ARB (e.g., candesartan, valsartan)

B. Safeguards for High-Alert Medications

Identification of High-Alert Medications in the Medication Management Process:

To differentiate High-Alert Medications from all other medications used in the Home, the following structured plan will be used to identify these medications.

- The use of auxiliary labels on high-alert medications
- Pre-printed identification as "High-Alert" on paper MAR
- Pre-populated designation as "High-Alert" on digital MAR
- Addition of "High-Alert" in the instruction line on the label (sig line)
- Pre-programmed requirement for double documentation in digital MAR

Other strategies and safeguards to reduce the likelihood of errors:

- Increased awareness of high-alert medications and appropriate use
  - Provide education for staff and prescribers on the high-alert medication list and the rationale for inclusion on the list
  - Provide targeted education on the indications and usual dosing of high-alert medications
- Where possible, limit the use of medications in particular classes to optimize awareness of indications and usual dosing among nursing staff
- Add medication system technologies to support safe medication management, e.g., bar coding to replace human checks.

C. Medications for which an Independent Double Check will be required

Independent double checks are one strategy that has been widely implemented to reduce errors with high-alert medications.

The following factors have been considered by the Medication Safety Committee in the decision-making process for requiring an independent double check for administering a medication in the Home:

- Potential for the medication to cause significant harm if given in the incorrect dose or to the incorrect patient
- Previous medication incidents involving this medication at the Home and/or reported in safety literature, such as ISMP Canada Safety Bulletins, or on the advice of the Pharmacy Service Provider

- Medications that are typically administered in an amount that is less than the total dose in the container; e.g., injectable medication not available in the specific prescribed dose; oral liquids
- High-dose/high-concentration medications; e.g., morphine greater than 15 mg/mL; hydromorphone greater than 10 mg/mL
- See page 9 for the process map

Table B: List of Medications Requiring Independent Double Checks

(each Home to insert your list here)

D. Completing an Independent Double Check

1. Each person separately compares the product label with the medication administration record to verify that the **resident name, medication name** and **dose/concentration** of are correct.
2. For administration of a partial amount from a container, each person independently calculates the medication dose to be administered and writes down the calculation and their answer, then the answers are compared to confirm agreement. Calculations are not observed "over the shoulder". Consider if the amount calculated to be administered makes sense in the context of the dose and product available (e.g., morphine 2 mg from a 10 mg/mL ampoule or vial = 0.2 mL not 2 mL).
3. Each person documents the completion of the independent check in the medication administration record, or other area of the health record, based on Home policy.

Who can do an independent check?

Nurses are not the only registered health care providers who can participate in an independent check.

- Physicians, pharmacists, and pharmacy technicians can be included in the pool of providers who can provide this check.
- Unregulated personnel, such as personal support workers, can also be trained to assist with this function. If unregulated personnel will be asked to support independent checks, specific training in this function is required. This training should include how to correlate information from the medication administration record and the medication label.
- In some cases, residents and family caregivers may also be able to assist. If a home adopts a resident engagement policy of including residents and families in medication checks, information should be provided in advance of requesting this assistance.

Home to insert how documentation of independent double checks will occur.
(Consider that documentation of checks by other members of the health care team and/or residents and family caregivers may require software modifications or alternate manual documentation approaches.)

E. Other Considerations

Transdermal medications (e.g., fentanyl patches)

New orders for transdermal patches

- Two staff independently review the order, and confirm that the product selected is the correct medication and dose and that the order is documented on the medication administration record for the correct resident.
- The patch is applied to the resident and the location where the patch was applied is documented on the medication administration record.
- Each person documents the independent verification according to Home policy.

Application of replacement transdermal patches

Transdermal opioid patches are generally ordered to be replaced at a standard frequency to maintain pain management (e.g., every 3 days for fentanyl). Patches are not "empty" when the replacement interval is reached and harm has occurred when the previous patch was not removed.

- Two staff independently review the medication administration record and confirm that the product selected is the correct medication and dose for the resident.
- One staff member removes the previous patch from the resident, noting the location from which the patch was removed, and documents the removal of the patch on the medication administration record.
- The second staff member verifies the patch removal and documents this according to Home policy (e.g., on the medication administration record or elsewhere in the health record).
- The removed patch is appropriately discarded per Home's policy on Controlled Drug destruction
- The new patch is applied to the resident and the location of application is documented on the medication administration record.
- Both staff document the application in accordance with Home policy.

Infusion Pumps:

If a resident is receiving a medication by infusion (e.g., an opioid for palliative pain management), two regulated staff members must be involved in checking the pump programming.

- Each person checks the medication order, specifically checking the medication concentration and rate per hour.
- Data entered into the pump is reviewed and confirmed for each step; i.e., concentration and rate of administration. Be sure to check if the pump is programmed in mg/h or mL/h.
- Each person documents their involvement in the check according to Home policy.
- An independent check is required with each cassette change or if the infusion rate or concentration is changed.
- The programmed data should be verified at each shift change to provide an opportunity to detect programming errors before harm occurs to a resident.

Limitations of double checks

Double checks are not failsafe; limitations include:

- Bias, especially confirmation bias, or "seeing what you expect to see"
- Trust; e.g., feeling that another team member is always reliable
- Complacency; i.e., staff know someone else will be checking their work

Electronic checks (e.g., bar coding) are considered a failsafe check for medication selection and are known to catch errors not caught by a human check.

Factors supporting optimal completion of an independent double check

- Structured, standardized training
- Limiting interruptions during medication preparation and administration
- Ensuring sufficient time to complete the checks
- Limiting information transfer between the people performing the check (independent checks)
- Examination of errors caught during independent double checks to improve the system

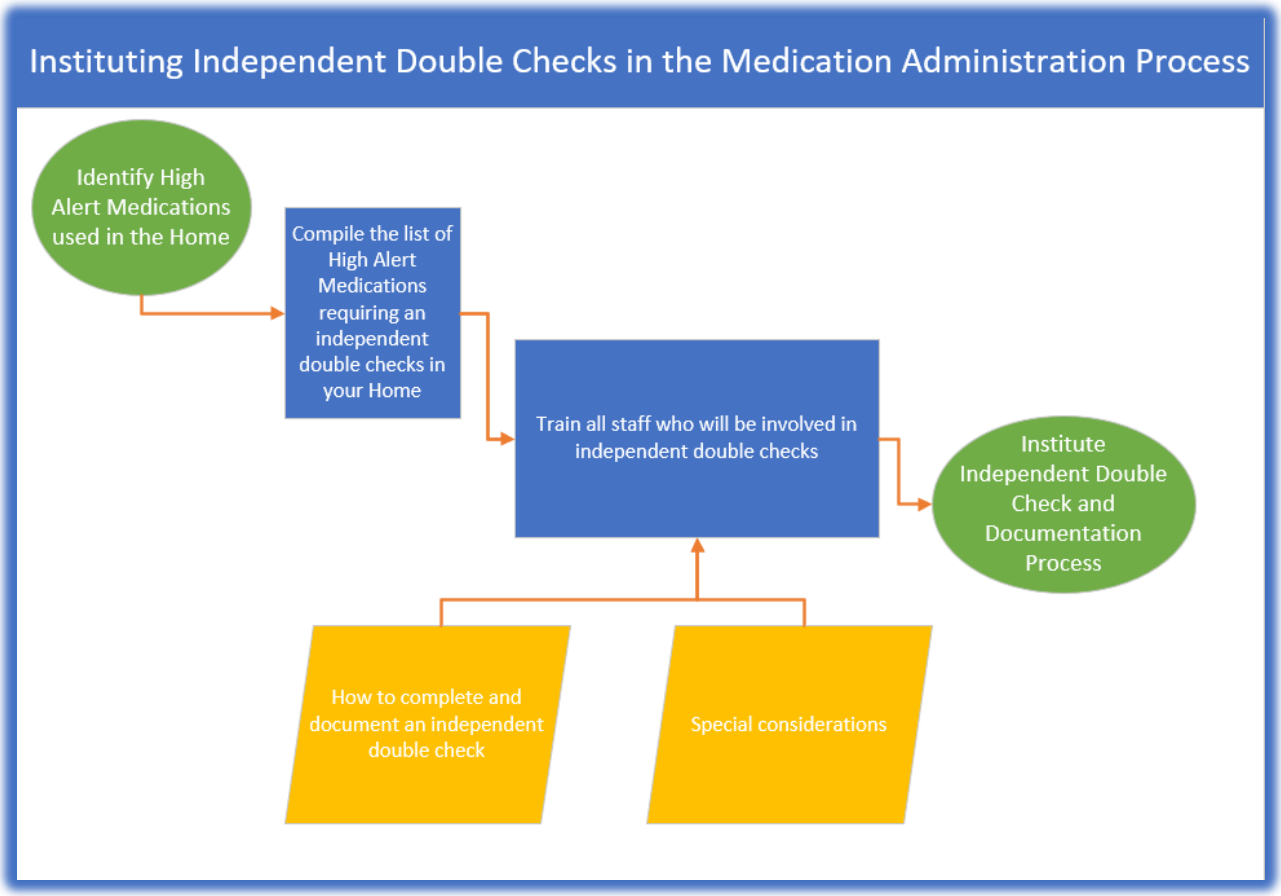
Glossary of Key Terms

Term	Definition
High-Alert Medication	High-alert medications are drugs that bear a heightened risk of causing significant harm when they are used **in error** (e.g., wrong drug, wrong dose, wrong route, wrong resident).
Independent Double Check[4]	A process in which a second practitioner conducts a verification. Such verification can be performed in the presence or absence of the first practitioner. In either case, the most critical aspect is to maximize the independence of the double check by ensuring that the first practitioner does not communicate what he or she expects the second practitioner to see, which would create bias and reduce the visibility of an error.
Medication Safety Committee[5]	A committee with representation from all disciplines involved in the medication use process as well as resident/family representatives that convenes on a regular basis (e.g., quarterly) to review and provide oversight of all aspects of medication use management in the Home. The committee reports to the person(s) who govern the organization. It is important that regular updates on the work of the committee are shared with residents and families. This Committee will have different names in different organizations, e.g., Professional Advisory Committee, Pharmacy and Therapeutics Committee, Medication Safety Committee, Quality Committee, etc.

[4] ISMP Canada Definitions page: https://www.ismp-canada.org/definitions.htm [cited 2021 Aug 26]

[5] Glossary. Medication Safety Self-Assessment for Long-Term Care, Canadian Version III. Institute for Safe Medication Practices Canada, Toronto, Canada, 2021.

Process Map:



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References:

1. ISMP US High-Alert List (2021): https://www.ismp.org/recommendations/high-alert-medications-long-term-care-list
2. ISMP High-Alert LTC list 2017
3. Alberta Health Services: Independent Double Check. Available from: https://albertahealthservices.ca/info/Page13651.aspx
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6. Independent Double Checks: Worth the Effort if Used Judiciously and Properly. ISMP Medication Safety Alert! June 6, 2019. Available from: https://www.ismp.org/resources/independent-double-checks-worth-effort-if-used-judiciously-and-properly

Revision History:

Revision Number	Effective Date	Reason for Change	Version Number
1			
2			