Guideline On Safe Use of High Alert Medications
GUIDELINE ON SAFE USE OF HIGH ALERT MEDICATIONS

First Edition

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# GUIDELINE ON SAFE USE OF HIGH ALERT MEDICATIONS

## CONTENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>DEFINITION</td>
<td>2</td>
</tr>
<tr>
<td>HIGH ALERT MEDICATION CATEGORY</td>
<td>2</td>
</tr>
<tr>
<td>COMMON RISK FACTOR</td>
<td>4</td>
</tr>
<tr>
<td>MANAGING HIGH ALERT MEDICATIONS</td>
<td>7</td>
</tr>
<tr>
<td>Procurement</td>
<td>7</td>
</tr>
<tr>
<td>Storage</td>
<td>7</td>
</tr>
<tr>
<td>Prescribing</td>
<td>7</td>
</tr>
<tr>
<td>Preparation</td>
<td>8</td>
</tr>
<tr>
<td>Dispensing/ Supply</td>
<td>8</td>
</tr>
<tr>
<td>Administration</td>
<td>8</td>
</tr>
<tr>
<td>Monitoring</td>
<td>9</td>
</tr>
<tr>
<td>Training</td>
<td>9</td>
</tr>
<tr>
<td>Information</td>
<td>10</td>
</tr>
<tr>
<td>Patient Education</td>
<td>10</td>
</tr>
<tr>
<td>Evaluation of Action</td>
<td>10</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>11</td>
</tr>
</tbody>
</table>
A. INTRODUCTION

Medication errors are significant and often preventable healthcare problems. Although many medication errors may not cause grave harm to patients, some medications are known to carry a higher risk of harm than other medications; and errors in the administration of these medications can have catastrophic clinical outcomes. The Joint Commission On Accreditation Of Healthcare Organizations (JCAHO) requires, per Medication Management Standard 7.10 health care organizations to identify certain high-risk, High Alert Medications used within the facility and further to develop specific processes for enhancing patient safety regarding their utilization.\(^1\) The Institute of Medicine’s published report in 1999 entitled ‘To Err is Human: Building a Safer Health System’ further highlights the significance of recognizing adverse drug events as a potentially preventable cause of medical injury in the United States.\(^2\)

Some medications have a very narrow margin of safety and can cause severe patient harm when implicated in an adverse drug event and hence require heightened vigilance. The consequences of an error associated with use of these medications can result in significant patient injury and special precautions must be employed with their overall management. These medications are identified as High Alert Medications.

The Institute for Safe Medication Practices (ISMP) has 19 categories and 14 specific medications in its list of High Alert Medications.\(^3\) The Institute recommends that High Alert Medications should be packed differently, stored differently, prescribed differently and administered differently than others. This means developing methods and using technology that makes it impossible for the drug to be given in a potentially lethal manner.

A safe medication system involves the collaboration of a wide variety of resources both directly and indirectly involved in patient care: from the processes to manufacturing and packaging, to prescribing and dispensing, to infusion pumps and other technologies used in administering these High Alert Medications.\(^3\)
To ensure safe medication practices and to eliminate medication errors that cause harm to our patients, a list of High Alert Medications has been identified and strategies recommended by the Pharmaceutical Services Division, Ministry of Health Malaysia. High Alert Medications listed in this guideline are based on the ISMP recommendations, medication error reports received by the Pharmaceutical Services Division, Ministry of Health Malaysia and feedbacks from major government hospitals.

It is hoped this guideline will help healthcare facilities further identify high-risk and problem-prone medication in their respective facilities as High Alert Medications. Handling practices for High Alert Medications must be further strengthened and all staff educated regarding these guidelines. Monitoring and supervision must be continuous to ensure sustainability and ongoing systems improvements.

**B. DEFINITION**

High Alert Medications are medications that bear a heightened risk of causing significant patient harm when these medications are used in error.\(^3\)

Though medication mishaps with High Alert Medications may or may not be more common than other drugs, the consequences following an error with these drugs can be especially serious to the patient.

**C. HIGH ALERT MEDICATION CATEGORY**

All drugs listed in this category are considered High Alert Medications although it may not be listed individually in this guideline. This list may be edited at the individual health facility based on localized medication error reports.

These medication errors may be related to labelling and/or packaging of drug, proprietary and generic names and/or misleading nomenclature.
## Classes / Categories of Medications

1. **Adrenergic agonists, IV**  
   *(e.g. adrenaline, noradrenaline)*

2. **Adrenergic antagonists, IV**  
   *(e.g. propranolol, labetalol)*

3. **Anaesthetic agents, general, inhaled and IV**  
   *(e.g. propofol, ketamine, dexmedetomidine)*

4. **Antiarrythmias IV**  
   *(e.g. lignocaine (lidocaine), amiodarone,)*

5. **Antifibrinolytics, hemostatic**

6. **Antithrombotic agents**  
   *(e.g. warfarin, heparin, tenecteplase, streptokinase)*

7. **Antivenom**  
   *(eg. Sea snake, cobra, pit viper antivenom)*

8. **Chemotherapeutic agents, parenteral and oral**

9. **Dextrose, Hypertonic, 20% or greater**

10. **Epidural and intrathecal medications**

11. **Glyceryl Trinitrate injection**

12. **Inotropic medications, IV**  
    *(e.g. digoxin, dobutamine, dopamine)*

13. **Insulin, subcutaneous and IV**

14. **Magnesium Sulphate Injections**

15. **Moderate sedation agents, IV**

16. **Neuromuscular blocking agents**  
    *(eg. pancuronium, atracurium, rocuronium, vecuronium)*

17. **Opiates and Narcotics**

18. **Parenteral Nutrition preparations**

19. **Potassium salt injections**

20. **Sodium Chloride Solution (greater than 0.9%)**
D. COMMON RISK FACTORS

Common risk factors associated with High Alert Medications are as follows:

- Poorly written medication orders.
- Incorrect dilution procedures.
- Confusion between IM, IV, Intrathecal, epidural preparations.
- Confusion between different strengths of the same medications.
- Ambiguous labeling on concentration and total volume of medications.
- Wrong infusion rate.
- Look alike or sound alike product and similar packaging.

E. MANAGING HIGH ALERT MEDICATIONS

With this guideline, it is hoped attention will be drawn to the risks associated with these High Alert Medication category of drugs even when used as intended.

- High Alert Medications will be prescribed, dispensed, and administered using practices that are proven safe.
- This guideline will be made available at the Pharmaceutical Services Division, Ministry of Health Malaysia website (www.pharmacy.gov.my).
- High Alert Medications should have “HIGH ALERT MEDICATION” labels on storage shelves, containers, product packages and loose vials or ampoules.
Examples of high alert labels:
1. High alert stickers for containers or product packages

2. High alert stickers for ampoules or vials

- High Alert Medications to be dispensed to patients need not be labeled as high alert
3. High alert labels for storage shelves in pharmacy

- High Alert Medications must be double checked before they are prepared, dispensed and administered to the patients. A system shall be established whereby one health care provider prepares the drug and another counterchecks it.

- All High Alert Medications issued from the pharmacy must be counterchecked and verified by another pharmacy staff prior to dispensing for the purpose of medication safety and accuracy.

- Any changes of brand/colour/preparation of High Alert Medications must be informed to the users as soon as possible.

- All equipment or devices used in the preparation and/or administration of medications shall be calibrated and maintained according to Standard Operating Procedure (SOP).

- All staff involved in the handling of High Alert Medications should be educated on this guideline.
Strategies to avoid errors involving High Alert Medications

These strategies are recommended for the safe storage and handling of High Alert Medications. All health care providers involved in the prescribing, dispensing and administration of these medications must be aware of the potential risks associated with them.

### Procurement

1. Limit the drug strengths available in the formulary of each health care facility.
2. Avoid frequent changes of brand or colour. Notify the end users whenever there are changes.
3. Inform all relevant personnel regarding new High Alert Medications listed in the hospital / clinic formulary.
4. Encourage the purchase of equipment and consumables with safety features for safe drug administration.

### Storage

1. All personnel must read the High Alert Medication labels carefully before storing to ensure medications are kept at the correct place.
2. All High Alert Medications should be kept in individual labeled containers. Whenever possible avoid look-alike and sound-alike drugs or different strengths of the same drug from being stored side by side.
3. Use TALL-man lettering to emphasize differences in medication names (eg. DOPamine and DOBUTamine).
4. Limit ward’s floor stock drugs to standard requirement. Reduce the quantity and variation of strength/preparation stocked.
5. Label all containers used for storing High Alert Medications as “HIGH ALERT MEDICATION”.

### Prescribing

1. Use standardized forms for written orders of cytotoxic drugs and parenteral nutrition.
2. Do not use abbreviations when prescribing High Alert Medications.
3. Specify the dose, route and rate of infusion for High Alert Medications prescribed. (e.g: IV Dopamine 5mcg/kg over 1 minute)
4. Prescribe oral liquid medications with the dose specified in milligrams.
5. Do not use trailing zero when prescribing. (e.g. 5.0 mg can be mistaken as 50 mg)

6. Use computerized prescriber order entry as far as possible, to eliminate illegible handwriting and misinterpretation of verbal orders. Safety features should be incorporated in the computer system for safe medication use.

### Preparation

1. Establish a counterchecking system for all preparations involving High Alert Medications.

2. The calculations involving:
   a. cytotoxic drugs and parenteral nutritions shall be independently counter checked by another pharmacist.
   b. extemporaneous preparations shall be independently counter checked by another pharmacist/trained personnel.

3. All diluted medications MUST BE LABELED with the name and strength IMMEDIATELY upon dilution.

Example of label:

<table>
<thead>
<tr>
<th>DRUG:</th>
<th>CONCENTRATION: ____ mg in __ mL NS/D5/____</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td>TIME:</td>
</tr>
<tr>
<td>PATIENT’S NAME:</td>
<td></td>
</tr>
<tr>
<td>R/N:</td>
<td></td>
</tr>
<tr>
<td>PREPARED BY:</td>
<td>CHECKED BY:</td>
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### Dispensing / Supply

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<tr>
<td>1.</td>
<td>All High Alert Medication containers, product packages and loose vials or ampoules issued to wards/units must be labeled as “HIGH ALERT MEDICATION” except for parenteral nutrition preparations.</td>
</tr>
<tr>
<td>2.</td>
<td>High Alert Medications to be dispensed to patients need not be labeled as high alert.</td>
</tr>
<tr>
<td>3.</td>
<td>High Alert Medications must be counter checked before dispensing.</td>
</tr>
<tr>
<td>4.</td>
<td>High Alert Medications shall be checked upon receiving by the healthcare providers.</td>
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### Administration

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| 1. | The following particulars shall be independently double checked against the prescription or medication chart at the bedside by two appropriate persons before administration:  
   • Patient’s name and RN  
   • Name and strength of medications  
   • Dose  
   • Route and rate (pump setting and line placements when necessary)  
   • Expiry date |
| 2. | Label the distal ends of all access lines to distinguish IV from epidural lines. |
| 3. | Ensure no distraction during administration of medications to patients by implementing special measures (example: wearing special apron). |
| 4. | Return all unused or remaining specially formulated preparations to the pharmacy when no longer required. |
| 5. | Ensure administration of intrathecal, cytotoxic drugs, epidural analgesics and parenteral nutritions is done by trained personnel. |
| 6. | Avoid ordering High Alert Medications verbally. In cases of emergency, phone orders have to be repeated and verified. |

### Monitoring

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<tr>
<td>1.</td>
<td>Closely monitor vital signs, laboratory data, patient’s response before and after administration of High Alert Medications.</td>
</tr>
<tr>
<td>2.</td>
<td>Keep antidotes and resuscitation equipments in wards/ units.</td>
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### Training

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<tr>
<td>1.</td>
<td>All personnel shall be trained prior to handling of High Alert Medications and documentation kept. Staff must be trained to prevent potential errors and enable them to respond promptly when mistakes do occur.</td>
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## Information

1. References or dilution guide should be made available in the wards and pharmacy.

## Patient Education

1. Educate patient and family members/caregivers on:
   - Name and purpose of medications
   - How much and when to take the medications
   - How to take their medications
   - Common side effects

   Encourage patient and family involvement by:
   - Asking what medications are being given and why they are being given
   - Ensuring positive identification before receiving medications

2. Storage of High Alert Medications.


## Evaluation of Action

References


4. High Alert Medication, Department of Pharmacy of Hospital Selayang

5. High Alert Medication, Department of Pharmacy of Hospital Tengku Ampuan Rahimah, Klang

6. Institute for Healthcare Improvement (http://www.ihi.org)


8. University of Kentucky Hospital, Chandler Medical Centre, policy no. PH-04-17, current as of 12/08
