



Campaign Intervention Fact Sheet

High Alert Medications

High-alert (or high-hazard) medications are medications that are most likely to cause significant harm to the patient, even when used as intended. The Institute for Safe Medication Practices (ISMP) reports that, although mistakes may not be more common in the use of these medications, when errors occur the impact on the patient can be significant.

Based on the findings and experience from hospitals that have participated in IHI's Collaboratives, the Campaign has chosen to focus on the following four groups of high alert-medications because they represent areas of greatest harm and greatest opportunity for improvement.

- 1. Anticoagulants.** Warfarin and insulins, both of which typically require ongoing monitoring to prevent overdose or toxicity, caused one in every seven estimated adverse drug events treated in emergency departments, and more than a quarter of all estimated hospitalizations. In the elderly, insulin, warfarin, and digoxin were implicated in one in every three estimated adverse drug events treated in emergency departments, and 41.5% of estimated hospitalizations. Warfarin is commonly involved in adverse drug events (ADEs) for a number of reasons. These include the complexity of dosing and monitoring, patient compliance, numerous drug interactions, and dietary interactions that can affect drug levels.
- 2. Narcotics and Opiates.** Many patients may experience harm even with appropriate dosing of narcotics. The most common kinds of harm include over-sedation, respiratory depression, confusion, lethargy, nausea, vomiting, and constipation. Much of this harm can be prevented with appropriate dosing or choosing of a different method of pain relief.
- 3. Insulins.** The goal of insulin therapy is to achieve control without causing immediate harm associated with hypoglycemia or long-term harm associated with hyperglycemia. The pharmacology of the drug, complexity of dosing, and variety of products all contribute to the potential for error and associated harm.
- 4. Sedatives.** Sedatives are a necessary component of an armamentarium to treat patients in the hospital setting. Examples of medications in this class include midazolam and chloral hydrate. Patients in hospitals may require sedation prior to procedures and during the hospital stay. However, inappropriate use may result in over-sedation, hypotension, delirium, and lethargy, and may contribute to the risk of falling. An ISMP survey identified benzodiazepines in patients over 65 (e.g., alprazolam) as high alert. Harm may result when clinicians are not aware of the onset of action, are titrating to effect without considering upper dose limits, and lack a process to address emergency situations such as respiratory depression and arrest.

The most common types of harm associated with these medications include hypotension, bleeding, hypoglycemia, delirium, lethargy, and bradycardia. The Campaign recommends that teams begin improving processes with at least one of these medication groups and then expand to include all four groups.



Highly Informative Tips (HITs) for Implementation

High Alert Medications

1. Design processes to *prevent* harm:

- Develop order sets, preprinted order forms, and clinical pathways or protocols to reflect a standardized approach to treat patients with similar problems, disease states, or needs.
- Minimize variability by standardizing concentrations and dose strengths to the minimal few needed to provide safe care.
- Consider pharmacist or nurse-run anticoagulation services.
- Include reminders and information about appropriate monitoring parameters in the order sets, protocols, and flow sheets.
- Consider protocols for vulnerable populations such as the elderly.

2. Design processes to *identify* errors and harm:

- Include reminders and information about appropriate monitoring parameters in the order sets, protocols, and flow sheets.
- Ensure that critical lab information is available to those who need the information and can take action.
- Implement independent double-checks where appropriate.

3. Design processes to *mitigate* harm:

- Develop protocols allowing for the administration of reversal agents without having to contact the physician.
- Ensure that antidotes and reversal agents are readily available.
- Have rescue protocols available.

Ask some basic yes-or-no questions before starting measurement in earnest. These questions can tell you a lot very quickly, before you invest the time to set up a more rigorous, long-term measurement structure.

1. Have you developed a protocol or order set for all appropriate medications?
2. Is the protocol or order set being used?
3. If you have developed forms, are the forms being used as designed?
4. Have you developed dose-conversion charts to minimize errors when changing from one medication to another? For pain medications?
5. If you have developed dose conversion charts, are they being used?

To answer these questions, use a sample of, at most, ten charts per week on the unit where you are testing the new process. This information allows the team to focus work at the beginning of the project and to identify areas for improvement.

Divide the goals up among several teams. Options include a diabetes management team working on insulin safety, and a pain team looking at pain medications and sedatives. Standardization and education are major goals for each group, to ensure that both staff and patients learn about the proper use of these special medications.