

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.*

Analgesics: Opioids

Opioids are high alert medications because they have the potential of errors in calculation of dosages and concentrations, proper identification of look-alike, sound-alike medications, and their potential for causing respiratory depression.

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| Buprenorphine | Buprenex [®] , Subutex [®] |
| Butorphenol | Stadol [®] |
| Codeine | Codeine phosphate, codeine sulfate, Tylenol with codeine [®] |
| Hydrocodone | Lorcet [®] , Lortab [®] , Norco [®] , Vicodin [®] , Zydone [®] |
| Hydromorphone | Dilaudid [®] |
| Levorphanol | Levo-Dromoran [®] |
| Meperidine | Demerol [®] , Meperitab [®] |
| Methadone | Dolophine [®] , Methadone |
| Morphine sulfate | Avinza [®] , Kadian [®] , MSIR [®] , MSContin [®] , Oramorph [®] , Roxanol [®] |
| Nalbuphine | Nubain [®] |
| Oxycodone | OxyContin [®] , OxyIR [®] , Roxicodone [®] |
| Oxymorphone | Numorphan [®] , Opana [®] , Opana ER [®] |
| Paregoric | camphorated tincture of opium |
| Pentazocine | Talwin [®] , Talwin NX [®] |
| Propoxyphene | Darvon [®] , Darvon N [®] , Darvocet [®] |

Anticoagulants

Anticoagulants are high-alert because they have a narrow therapeutic range, many food and drug interactions, and complex dosing regimens.

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| Argatroban | Argatroban |
| Bivalirudin | Angiomax [®] |
| Cilostazol | Pletal [®] |
| Clopidogrel | Plavix [®] |
| Dalteparin | Fragmin [®] |
| Dipyridamole | Persantine [®] , Aggrenox [®] |
| Enoxaparin | Lovenox [®] |
| Fondaparinux | Arixtra [®] |
| Heparin | Hep-flush [®] , Hep-lock [®] |
| Lepirudin | Refludan [®] |
| Pentoxifylline | Trental [®] |
| Ticlopidine | Ticlid [®] |
| Tinzaparin | Innohep [®] |
| Warfarin | Coumadin [®] |

Promethazine injection

The injectable form of promethazine is a high-alert medication because of the risk of damage and necrosis if it is accidentally given into the arteries, or subcutaneous tissue. Promethazine injection may cause drowsiness, confusion, sedation and increase the risk for falls.

Promethazine injection Phenergan[®] injection

Methotrexate

Methotrexate is a high-alert medication because of potential dosing errors when weekly doses are misunderstood as "daily" doses. It can cause hepatotoxicity, renal failure and it will suppress the immune system making patients more prone to infection.

Methotrexate Rheumatrex[®], Trexall[®]

Midazolam injection

Midazolam injection is considered a high-alert medication because of the risk of respiratory depression and respiratory arrest when used without appropriate resuscitative equipment or qualified personnel for monitoring.

Midazolam injection Versed[®]

Injectable Cardiovascular Agents: Antiarrhythmics

These injectable antiarrhythmics are high-alert medications because of the increased risk of bradycardia and AV block during administration. Appropriate monitoring is required.

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| Amiodarone | Cordarone [®] , Pacerone [®] |
| Ibutilide | Corvert [®] |
| Isoproterenol | Isuprel [®] |
| Procainamide | Procanbid [®] |
| Quinidine | Quinidine |

Injectable Cardiovascular Agents: Beta Blockers

Injectable beta-blockers are high-alert medications because of the increased risk of hypotension, bradycardia and AV block during administration. Appropriate monitoring is required. Also, some significant differences exist between oral and IV dosing. Caution must be taken when switching from one route of administration to another.

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| Atenolol | Tenormin [®] |
| Esmolol | Brevibloc [®] |
| Labetalol | Trandate [®] |
| Metoprolol | Toprol [®] |
| Propranolol | Inderal [®] |

Cardiovascular Agents: Digoxin

Digoxin is a high-alert medication because of the narrow therapeutic serum range; the therapeutic endpoint is difficult to quantify and digoxin toxicity may be life-threatening. Appropriate monitoring is required.

Digoxin Lanoxin[®]



Chemotherapeutic Agents

Chemotherapeutic agents are high-alert medications because of the complexity of therapeutic regimes, the variability of dosing and the toxic nature of the medications.

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| Anastrozole | Arimidex® |
| Bicalutamide | Casodex® |
| Bulsulfan | Busulfex® |
| Chlorambucil | Leukeran® |
| Cyclophosphamide | Cytoxan® |
| Exemestane | Aromasin® |
| Flutamide | Eulexin® |
| Fulvestrant | Faslodex® |
| Goserelin | Zoladex® |
| Hydroxyurea | Hydrea®, Droxia®, Mylocel® |
| Letrozole | Femara® |
| Leuprolide | Eligard®, Lupron® |
| Melphalan | Alkeran® |
| Mercaptopurine | Purinethol® |
| Nilutamide | Nilandron® |
| Tamoxifen | Nolvadex® |
| Toremifene | Fareston® |

Diabetes Agents (oral)

Diabetic agents are high-alert medications because of the risk for serious harm associated hypoglycemic and hyperglycemic reactions when errors in dispensing, administration and dosing have occurred.

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| Acarbose | Precose® |
| Chlorpropamide | Diabinese® |
| Exenatide | Byetta® |
| Glimepiride | Amaryl® |
| Glipizide | Glucotrol® |
| Glyburide | Diabeta®, Glynase®, PresTab®, Micronase® |
| Metformin | Glucophage® |
| Miglitol | Glyset® |
| Pioglitazone | Actos® |
| Nateglinide | Starlix® |
| Pramlintide | Symlin® |
| Repaglinide | Prandin® |
| Rosiglitazone | Avandia® |
| Sitagliptin | Januvia® |
| Tolazamide | Tolinase® |
| Tolbutamide | Orinase®, Tol-tab® |

Diabetes Agents: Insulins

Insulins are high-alert medications because of the risk for serious harm associated complex dosing regimens and the potential for hypoglycemic and hyperglycemic reactions when errors in dispensing and administration have occurred.

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| Insulin aspart | Novolog® |
| Insulin detemir | Levemir® |
| Insulin glargine | Lantus® |
| Insulin glulisine | Apidra® |
| Insulin lispro | Humalog® |
| Insulin NPH | Humulin N®, Novolin N® |
| Insulin Regular | Humulin R®, Novolin R® |

Gastrointestinal Agents: Antidiarrheals

Camphorated tincture of opium is a high alert medication because of its name confusion with Opium tincture. Opium tincture contains 25 times more morphine than camphorated tincture of opium and therefore an error could potentially result in death.

Camphorated tincture of opium Paregoric®

Inotropic Medications

Inotropic medications are high alert because of risk of cardiac arrhythmias and hypotension associated with the use of the drugs. Appropriate monitoring is required.

Milrinone injection Primacor®
Dopamine injection Intropin®
Dobutamine injection Dobutrex®

Potassium Injections

Potassium injection is a high alert medication because of potential errors in dosing, route and rate of IV administration.

Potassium chloride and potassium phosphate injection

Hypertonic Sodium Chloride Injection

Hypertonic sodium chloride for injection is a high alert medication because of its accidental substitution for normal tonic solutions. Errors can result in hypernatremia and death. "Hypertonic" sodium chloride solutions have concentrations greater than 0.9%.

Hypertonic sodium chloride for injection (3% or 5% for example)

Hypertonic Dextrose Injection 20% and above

Hypertonic dextrose injection, 20% and above, is a high alert medication because of its accidental substitution for lower Dextrose solutions and the potential harm associated with rapid infusion including fluid overload, altered electrolytes, congested states and pulmonary edema.

Dextrose 20%, 30%, 40%, 50% 70%



This list is for reference only and may not be considered complete.

* 5 Million Lives Campaign. Getting Started Kit: Preventing Harm from High-Alert Medications. Cambridge, MA: Institute for Healthcare Improvement; 2008. (Available at www.ihl.org)