

The Military Health System's

PARTNERSHIP FOR PATIENTS CAMPAIGN

SAFE CARE SAVES LIVES



Implementation Guide for Adverse Drug Events

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1. Introduction

This implementation guide was created to support the Partnership for Patients, a national initiative sponsored by the Department of Health and Human Services to reduce harm in health care facilities. Military Health System leadership has pledged its support to the PfP, and has made a commitment to specific, identified aims. Improving the quality and safety of health care in all Department of Defense facilities will only be possible with universal support at every level in the MHS.

This guide is one of 10 harm-specific guides designed to assist you as you implement identified evidence-based practices to improve patient care. Common to all guides are resources that support efforts to educate the health care team by providing MHS-selected -EBPs and quality improvement strategies.

In addition, implementation strategies and tools relevant to all harm categories are included in a guide titled “Practical Applications for Process Improvement and Change Management.” This guide supports efforts to equip the health care team with rapid-cycle process improvement methods and engage the health care team through the use of change management strategies.

2. Adverse Drug Event Prevention Evidence-Based Practices

2.1 ADEs - Background Information

According to HHS, an adverse drug event is an injury resulting from the use of a drug. ADEs in hospitals can be caused by medication errors such as accidental overdoses or incorrect drug administration to a patient, or by adverse drug reactions to a normal dose, such as allergic reactions or excessive bleeding after treatment with the intended dose of a drug that prevents dangerous blood clots. For more information, visit:

<http://www.healthcare.gov/compare/partnership-for-patients/safety/ade.html>.



ADE Burden of Illness

- More than 770,000 people are injured or die each year in hospitals from ADEs.
- National hospital expenses to treat patients who suffer ADEs during hospitalization are estimated between \$1.56-5.6 billion annually.
- Patients who experienced ADEs were hospitalized an average of 8-12 days longer than patients who did not experience ADEs.
- Nearly 120,000 patients each year need to be hospitalized for further treatment after emergency room visits for ADEs.
- Hospital inpatients with ADEs were on average 62 years old.

Sources:

1. *Reducing and Preventing Adverse Drug Events To Decrease Hospital Costs*. Research in Action, Issue 1. AHRQ Publication Number 01-0020, March 2001. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/qual/aderia/aderia.htm> Accessed 8/2/12.
2. *Adults and Older Adult Adverse Drug Events*. Medication Safety Program, Program Focus and Activities, May 2011. http://www.cdc.gov/MedicationSafety/Adult_AdverseDrugEvents.html Accessed 8/2/12.

ADEs encompass a wide variety of hospital-acquired conditions, and constitute more than 30 percent of Hospital-Acquired Conditions according to a 2010 study conducted by the HHS Office of Inspector General. The PfP estimates that 50 percent of the 1.9 million ADEs that occur in hospitals each year are preventable¹.

2.2 Risk Factors for ADEs

While research has not identified valid predictors, the following factors have been associated with ADEs²:

- Older Age
- Severity of illness
- Intensity of treatment
- Polypharmacy

¹ *Preventing Adverse Drug Events*, <http://www.healthcare.gov/compare/partnership-for-patients/safety/ade.html>, Accessed 8/2/12.

² *Reducing and Preventing Adverse Drug Events To Decrease Hospital Costs*. Research in Action, Issue 1, <http://www.ahrq.gov/qual/aderia/aderia.htm> Accessed 8/2/12.





2.3 Evidence-Based Practice Guidelines

To reduce the prevalence of ADEs, the Institute for Healthcare Improvement has developed strategies for reducing harm from four high-alert medication categories: anticoagulants, narcotics, insulins, and sedatives. High-alert medications are medications that are most likely to cause significant harm to the patient, even when used as intended.

Changes to Improve Management of Heparin

- Consistent utilization of standardized weight-based heparin protocol throughout facility
 - Limit to no more than one or two protocols
 - Use preprinted order forms or ordering protocols
 - Establish guidelines to hold heparin and provide reversal therapy for heparin over-anticoagulation
 - Protocol should address how to evaluate and treat patients with heparin-induced thrombocytopenia (HIT)
 - Ensure heparin dosing protocols account for the use of thrombolytics and GIIb/IIIa inhibitors
 - Ensure heparin is not administered within 6-12 hours of a dose of LMWH
 - Ensure that appropriate monitoring parameters are implemented and used reliably
- Implement standardized concentrations of heparin
- Use ONLY pre-mixed infusions and ready-to-administer products when available
- Remove high-concentration products from floor stock
- Separate look-alike/sound-alike (LASA) products (names and packaging) when using or storing
- Implement effective independent double checks
- Use smart pumps with accurate drug libraries to infuse heparin
- Administer boluses from pharmacy prepared syringes or set up smart pump libraries
- Make heparin-flush available only in syringes
- Do not accept heparin orders with unapproved abbreviations (i.e. U for units, trailing zero, etc)
- Use LMWH when appropriate, instead of heparin
- Utilize auxiliary labels for high-alert medications consistently within the organization



Changes to Improve Management of Warfarin

- Consistent utilization of standardized protocols and dosing
 - Use preprinted order forms or ordering protocols that are prominently labeled by indication (i.e., A. Fib, DVT, etc.)
 - Standardized protocols for the initiation and maintenance of warfarin therapy including, Vitamin K dosing guidelines
 - Develop an evidence-based protocol, to discontinue and restart warfarin preoperatively
 - Develop a evidence-based protocol, to bridge warfarin therapy with more rapidly-acting anticoagulants such as heparin or LMWH
- Use ONLY oral unit-dose products, when these products are available
- Ensure effective implementation of independent double checks
- Minimize available strengths of oral formulations to the essential few
- Ensure efficient access to laboratory results (i.e., available within 2 hrs) and/or use of point-of-care testing at the bedside
- Include a nutrition consult to avoid drug/food interactions and educate the patient about them
- Create daily CHCS report of patients on warfarin for nutrition education
- Use medication reconciliation to improve handoffs of medication information
- Engage patients by developing educational programs and training at an appropriate literacy level
- Implement system to properly verify inventory stocking in the Automated Dispensing Cabinets
- Utilize auxiliary labels for high-alert medications consistently within the organization



Changes to Improve Management of Narcotics

- Consistent utilization of standardized protocols for the initiation and maintenance of pain management
 - Use protocols and pre-printed orders (CPOE order sets) where possible for PCA, postoperative, epidural, and intrathecal pain management
 - Include dose calculations, maximum bolus doses, prescribed dose (i.e., mg/hr), monitoring guidelines, and options for non-opioid analgesics
 - Establish a standard naloxone regime that can be given before calling physician, based on a protocol signed by a physician
- Standardize monitoring protocols including documentation of vital signs and pain score following each dose
- Use appropriate monitoring for adverse effects of narcotics and opiates
- Minimize or eliminate multiple drug strengths
- Implement standard concentrations of narcotics/opiates
- Utilize Tall-man lettering to distinguish LASA medications
- Establish and widely circulate to all staff information and formulas for narcotic dose-equivalences
- Prepare narcotic/opiate infusions in the pharmacy ONLY
- Use smart pumps with accurate drug libraries
- Label distal end of all access lines to distinguish IV from epidural
- Use tubing without injection ports for epidural
- Standardize to single drug as opiate of choice for PCA
- Consult a pain specialist if the managing physicians are not knowledgeable about pain control
- Increase the use of non-pharmacologic intervention for pain and anxiety
- Educate patient/family about the use of PCA before the surgical procedure
- Dose narcotics to a pain score mutually agreed upon by patient and clinicians prior to procedures
- Use medication reconciliation to improve handoffs of medication information
- Educate patients regarding hypotension and dizziness upon rising
- Provide adequate lighting, especially at night
- Anticipate and schedule toileting for high-risk patients
- Utilize auxiliary labels for high-alert medications consistently within the organization



Changes to Improve Management of Insulin

- Utilize consistent pre-printed diabetic and insulin infusion orders
- When prescribing insulin, include or refer to defined standards for laboratory testing and clinical monitoring of patients
- Ensure appropriate monitoring through more rapid testing of blood glucose
- Use a diabetic management flow sheet to track blood glucose values, carbohydrate intake and insulin administration
- Eliminate or limit the use of sliding insulin dosage scales; if used standardize it through use of a protocol/preprinted order form or computer order set that clearly designates the specific increments of insulin coverage
- Standardize to a single concentration of IV-infusion insulin
- Prepare all infusions in the pharmacy
- Do not accept insulin orders with unapproved abbreviations (i.e., U for units, trailing zero, etc)
- Implement different means to separate LASA insulins (i.e., individual bins) and to make them look different or call attention to important information (i.e., auxiliary/colored labels, highlighter, etc)
- Utilize Tallman lettering to distinguish LASA insulins
- Do not dispense insulin in original container only, label the vial with patient's name and expiration date. Use vial for single patient use ONLY.
- Use smart pumps with accurate drug libraries
- Implement effective independent double checks
- Consider patient's usual time for meals and timeframe for insulin administration
- Consider unique delivery devices such as insulin pen with proper safeguards (i.e., dispensed by pharmacy ONLY, label each pen with patient's name, auxiliary label for single patient use, identified authorized staff to administer it, etc)
- Allow and encourage patient self-management (or parents for young pediatric patients) when patients and parents are capable and willing
- Encourage patients to question doses and timing of insulin administration
- Utilize auxiliary labels for high-alert medications consistently within the organization



Changes to Improve Management of Sedatives

- Utilize standardized preprinted order forms for ordering sedatives consistently
- Use dosing protocols and automatic dose reductions for benzodiazepines and other sedatives and hypnotics in target populations
- Stock and prescribe only one concentration of oral moderate sedation agents
- Monitor all children who have received chloral hydrate for pre-operative sedation before, during, and after the procedure
- Monitor patients for respiratory depression, as evidenced by decreased oxygen saturation or increased CO2 levels, by using pulse oximeters and capnographers
- Address in policy who can administer sedating medications
- Implement effective independent double checks
- Assess medications and patient vital sign data to recognize predictable and preventable trends reflected by vital signs, patient lab values, and drug interactions
- Have age- and size-appropriate resuscitation equipment and reversal agents available wherever the medications are administered, and during procedures that are performed when the patient is under sedation
- Develop a program that includes fall prevention strategies
- Educate patients regarding hypotension and dizziness upon rising
- Provide adequate lighting, especially at night
- Anticipate and schedule toileting for high-risk patients
- Evaluate medication list with patient for additive risk of sedation
- Use auxiliary labels for high-alert medications consistently

2.4 Proven Strategies

Additional strategies cited by the Agency for Healthcare Research and Quality and the General Accounting Office to improve the medication delivery system include^{3,4}

- Improve incident reporting systems (i.e., Patient Safety Reporting System)
- Create a better atmosphere for health care providers to report ADEs so that the person reporting the error does not fear repercussions or punishment
- Rely more on pharmacists to advise providers in prescribing medications and promote education on medications
- Improve nursing medication administration and monitoring systems
- Implement a standardized medication reconciliation form

³ *Reducing and Preventing Adverse Drug Events To Decrease Hospital Costs*, op cit.

⁴ *Adverse Drug Events: The Magnitude of Health Risk is Uncertain Because of Limited Incidence Data*. Government Accounting Office Report to Congressional Requesters, January 2000. www.gao.gov/new.items/he00021.pdf





- Improve communication between providers and patients about risks and benefits of medication
- Dispense drugs from pharmacy in single-unit/single-dose packages
- Install automated dispensing systems
- Barcode hospital medications
- Institute Look-Alike/Sound-Alike alerts
- Include pharmacists in hospital rounds
- Use the FDA's MedWatch program to report serious adverse drug reactions

2.5 MHS ADEs Performance Measures

In order to collect and interpret data that documents success in reducing the incidence of ADEs, it is imperative that outcome measures be utilized. The MHS has committed to using the measures listed below. MTFs are expected and encouraged to report facility-wide ADEs and near-misses in the Patient Safety Reporting System.

Description	Data Source	Metric
<ul style="list-style-type: none"> • Total ADEs per calendar year for each category (Anticoagulants (only Heparin and Warfarin), Narcotics, Insulins, and Sedatives) • Number of ADEs per calendar year resulting in harm (defined as Harm Scale Categories; Death, Severe Permanent Harm, Permanent Harm, Temporary Harm, or Additional Treatment) for each category (Anticoagulants (only Heparin and Warfarin), Narcotics, Insulins, and Sedatives) 	PSR and JAMRS Data	Outcome Measure



3. References

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