Adverse Drug Event (High-Alert Medications) Driver Diagram 2012-2013

AIM: Reduce the Incidence of Harm from Adverse Drugs Events (ADEs) due to High-Alert Medications (HAMs) by 50% by 12/31/13

Primary Driver	Secondary Driver	Change Ideas
Awareness, Readiness & Education	• Assess organizational capacity, readiness, and willingness to implement systems to prevent ADEs • Create awareness of HAMs most likely to cause ADEs	• Use Institute for Safe Medical Practices assessment tool[1] • Assess clinical staff knowledge (pre-test); Educate; 6 week post test; Target gaps[2,3] • HAMs – Insulin, Anticoagulants/Antithrombotics, Narcotics, sedatives
Standardized Care Processes	• Implement ISMP quarterly action agendas where appropriate[i] • Develop standard order sets using safety principles and MD and pharmacist input. • Allow nurses to administer rescue drugs based on protocol without obtaining physician approval • Sequence implementation by drug class	• Review key literature [4,5,6,7,8] • Analyze local ADE data to guide focus[9] • Use IHI "How to Guides" and "Knowledge Center" [10] and ISMP guidelines[ii] • Pick HAM drug class with highest priority to begin practice implementation instead of tackling all simultaneously • **INSULIN:** Reduce sliding scale variation (or eliminate sliding scales) • **INSULIN:** Coordinate meal and insulin times • **ANTICOAGULANTS:** Use protocol to discontinue or restart warfarin peri-operatively
Avoidance of Errors During Care Transitions	• Implement effective medication reconciliation processes • Where appropriate, create ambulatory clinics for HAM follow-up	• Reconcile all medications at each transition • Use flowsheets that follow the patient through the transitions of care (not unit based but patient based) • **INSULIN:** Require new insulin orders when patient is transitioned from parenteral to enteral nutrition • **ANTICOAGULANTS:** Transition patients to ambulatory warfarin clinics

[i] Website. Retrieved at http://www.ismp.org/Newsletters/acutecare/actionagendas.asp
[ii] Website. Retrieved at http://www.ismp.org/Tools/guidelines/default.asp

Decision Support	• Include pharmacists on rounds • Monitor overlapping medications given to a patient	• Use alerts for dosage limits. Don't overuse alerts. • **ANTICOAGULANTS:** Use pharmacists to assist with identification of alternatives when contraindications exist • **ANTICOAGULANTS:** Have pharmacists perform independent double-checks of all VTE prophylaxis orders • **NARCOTICS/SEDATIVES:** Use alerts to avoid over-sedation and respiratory arrest (with/without an Electronic Medical Record) • **NARCOTICS/SEDATIVES:** Use alerts to avoid multiple Rxs of narcotics/sedatives
Prevention of Failure	• Minimize or eliminate nurse distraction during the medication administration process • Standardize concentrations and minimize dosing options where feasible • Timely lab results with effective system to ensure review and action • Use non-pharmacological methods of pain and anxiety management where appropriate • Identify "look-alike, sound-alike" medications and create a mechanism to reduce errors (e.g., different locations, labels, alternate packaging)	• Adopt an organization wide definition and understanding of the practice of an "independent double-check", then perform independent double-checks on all HAMs • Use the "Cone of Silence" during medication administration • Use visual cues (HAM specific bedside flags) • **INSULIN:** Allow patient management of insulin where appropriate • **INSULIN:** Set limits on high dose orders • **ANTICOAGULANTS:** Use pre-packaged heparin infusions; reduce the number of heparin formulations in the hospital • **ANTICOAGULANTS:** Use low molecular weight heparin or other agents instead of unfractionated heparin whenever clinically appropriate • **ANTICOAGULANTS:** Make lab results available within 2 hours • **ANTICOAGULANTS:** Perform automatic nutrition consults for all patients on warfarin to avoid drug-food interactions • **NARCOTICS/SEDATIVES:** Use a table of drug to drug conversion doses • **NARCOTICS/SEDATIVES:** Use fall

		prevention programs • **NARCOTICS/SEDATIVES:** Use dosing limits • **NARCOTICS/SEDATIVES:** Use sedation scales to guide dosing in ALL care areas
Identification and Mitigation of Failure	• Educate patients/families regarding risk of ADEs from 'their' HAMs • Administer medications on time • Analyze dispensing unit override patterns • Transition to "Culture of Safety" environment for improved error analysis • Prompt real time learning from each failure	• Monitor, understand, and mitigate medication administration delays • Assess culture with Agency for Healthcare Research and Quality Culture of Safety survey [11] • Use an error reporting system that aggregates data to identify and redesign error prone processes • Use technology to alert (real time) key staff when rescue drug administered
Smart Use of Technology	• Use 'smart pumps' • Understand errors that can occur from Patient Controlled Analgesic devices and other medication delivery devices • Use alerts wisely • Use data/information from alerts and overrides to redesign standardized processes • Link order sets to recent lab values or other monitoring parameters.	• Educate staff regarding unintended consequences of device use/failure • Use the proper level of alerts with forcing functions and stops for drug, allergy and diagnosis interactions • Do not allow alert overrides without a documented reason [12]

[1] 2011 Institute for Safe Medication Practices (ISMP) Medication Safety Self Assessment® for Hospitals. Retrieved at http://ismp.org/selfassessments/Hospital/2011/pdfs.asp
[2] Hsaio et al, Nurses' knowledge of high-alert medications: instrument development and validation, Journal of Advanced Nursing 66(1), 177-190
[3] Lu, M.-C.et al, Nurses' knowledge of high-alert medications, A randomized controlled trial, Nurse Educ. Today (2011)
[4] Institute for Healthcare Improvement High-Alert Medication Safety (Improvement Map). Retrieved at http://app.ihi.org/imap/tool/#Process=b8541097-7456-4aab-a885-38c31950e6bf
[5] Institute for Safe Medication Practices High-Alert Medications . Retrieved at http://ismp.org/Tools/highAlertMedications.asp
[6] California Hospital Association Medication Safety Committee High Alert Medication Guidelines for Select Anticoagulants. Retrieved at http://www.cshp.org/uploads/file/Shared%20Resources/2012/guideline_anticoagulants_2.21.12.pdf
[7] Federico, Preventing Harm from High-Alert Medications, The Joint Commission Journal on Quality and Patient Safety, 33(9), 537-542.
[8] Graham et al, Implementation of a High-Alert Medication Program, The Permanente Journal 12(2), 15-22.
[9] Stavroudis et al, NICU medication errors: identifying a risk profile for medication errors in the neonatal intensive care unit, Journal of Perinatology (2010) 30, 459-468.

[10] Institute for Healthcare Improvement High-Alert Medication Safety Knowledge Center. Retrieved at http://www.ihi.org/explore/HighAlertMedicationSafety/Pages/default.aspx

[11] Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture. Retrieved at http://www.ahrq.gov/qual/patientsafetyculture/hospsurvindex.htm

[12] Miller et al, Bar code Medication Administration Technology: Charcterization of High-Alert Medication Triggers and Clinician Workarounds, The Annals of Pharmacotherapy 2011 Feb Vol 45, 162-168.