Medication Safety – the Irish Medication Safety Network Approach

Brian Cleary PhD
Chief Pharmacist, Rotunda Hospital
Honorary Clinical Associate Professor, RCSI

National Medication Safety Intensive Course and Summit: Towards a National Approach

7-9th October 2015
A Collaborative Study of Medication Safety in Four Irish hospitals

Kirke C., M.Sc. (Clin. Pharm.), MPSli
Tighe P., MBA, M.Sc. (Clin. Pharm.) MPSlii
Colohan G., M.Sc. (Clin. Pharm.), MPSliii
Harnett B., M.Sc. (Clin. Pharm.), MPSliv
Creaton G., B.Sc. (Pharm.), MPSliii
Delaney T., B.Sc. (Pharm.), FPSli


Abstract
Medication error and adverse drug reactions occur frequently, leading to a high burden of patient harm in the hospital setting. Many Irish hospitals have established medication safety initiatives, designed to encourage reporting and learning to improve medication use processes and therefore patient safety. Eight Irish hospitals or hospital networks provided data from voluntary medication safety incident and near miss reporting programmes for pooled analysis of events occurring between 1st January 2005 and 30th June 2007. 6179 reports were received in total (mean 772 per hospital; range 95-1855). 95% of reports did not...
Safety Alert

Novel Oral Anticoagulants (NOACs)

Issue
Apixaban (Eliquis®), dabigatran (Pradaxa®) and rivaroxaban (Xarelto®) are anticoagulants licensed in varying doses in adults for prevention and treatment of venous thromboembolism and for non-valvular atrial fibrillation. Other NOACs may become available, e.g. edoxaban (Savaysa® or Lixiana®). Anticoagulants are high-risk drugs, with risks including:

- **Bleeding or haemorrhage**, particularly with:
  - Use in combination with medicines increasing the bleeding risk.
  - Renal impairment, chronic or acute (e.g. with sepsis), which prolongs the half-life of these drugs. If bleeding occurs, there are no reversal agents and prolonged supportive treatment may be required.

- **Stroke or venous thromboembolism as a result of omission or under-dosing**. The NOACs have a short duration of action so omission of a dose(s) may rapidly lead to a loss of anticoagulant effect.

- **Lack of familiarity** of healthcare professionals and patients with these medicines.

Examples of Harm

- A patient who had been taking dabigatran for 2 years developed acute kidney injury associated with an infection. This resulted in accumulation of dabigatran, contributing to a major haemorrhage.

- A patient was discharged from hospital on rivaroxaban, which was subsequently omitted from his prescription in the community. The patient suffered a stroke.

- A patient on rivaroxaban was commenced on dronedarone in an out-patient clinic. The patient was admitted 2 weeks later with a gastrointestinal bleed. This combination is contra-indicated.

- A patient was admitted with anaemia and a raised INR. Was taking warfarin and dabigatran, instead of dabigatran alone. Patient had not switched from warfarin to dabigatran as intended.

How to reduce the risk
Best Practice Guidelines
for the Safe Use of Intravenous Potassium in Irish Hospitals
The family of a Galway woman, who died after being given a lethal injection of potassium chloride, told an inquest today that they were devastated by her death. They also said that they were deeply saddened by the insensitive way they felt they had been treated by the hospital authorities which up to today had made no apology to them.
HanaKapai Beach

WARNING!

Do not go near the water unseen currents have killed visitors.
“The upshot is that it is much easier to identify a minefield when you observe others wandering into it than when you are about to do so.”
What are we doing now?
A woman in preterm labor was receiving IV magnesium sulfate. Despite treatment, precipitous labor and birth occurred. Oxytocin was ordered after delivery of the placenta. Instead of oxytocin, magnesium sulfate was infused at a rapid rate. The magnesium sulfate infusion had been discontinued and IV line removed from the pump but remained connected to the patient at the Y port. The patient was returned to her LDR room and vital signs reassessed approximately 1/2 hour later. The patient was found nonresponsive and not breathing. A code was initiated; resuscitation was difficult, defibrillation required 3 times and 9 minutes required to restore heart rate. Subsequently, it was learned that she received approximately 550 mL of the magnesium sulfate IV fluid (22 g of magnesium sulfate). Despite aggressive resuscitation, calcium chloride and intensive care, she did not regain consciousness and remains in a persistent vegetative state.
Safety Alert

IV Magnesium Sulphate in Obstetrics

Issue
Magnesium sulphate is indicated in the management of pre-eclampsia and also for fetal neuroprotection if there is a risk of preterm delivery. Intravenous magnesium has been repeatedly associated with medication errors internationally and locally. One US report described 52 cases of accidental IV magnesium overdose (1). IV magnesium errors may result in serious patient harm or death. Such errors are well understood and effective preventative strategies are available.

How to reduce the risk (1, 3)
Conditions that make IV magnesium errors more likely include: patient transfer/handover, inadequate staffing, unfamiliarity with IV magnesium or infusion pumps, chaotic environment, differing protocols between institutions, assumptions/miscommunications, preparing solutions in clinical areas, inadequate labelling, poor observation of the woman’s clinical status and assuming the woman is stable or tired (1).

- **Implement standardised protocols** which address: prescribing, pump programming, second person checking of the selected infusion bag and pump settings, frequency of observation, handover precautions and the availability of IV calcium for treatment of magnesium overdose.
- **Ensure appropriate monitoring of patients on magnesium sulphate**: indicators of magnesium levels include maternal respiratory rate, oxygen saturation, deep tendon reflexes and state of consciousness. Clear protocols should be in place for assessments during magnesium administration.
- **Use ready-mixed IV magnesium infusion bags when possible**. If product shortages occur, ensure that clear guidance is available for preparing these solutions from concentrated magnesium vials.
- **Only use 4g and 20g infusion bags**. Use the 4g infusion bag solely for the delivery of a bolus dose and the 20g infusion bag solely for the delivery of the maintenance infusion (3).
Failure to set a volume limit for a magnesium bolus dose leads to harm

From the June 3, 2010 issue

Problem: A 27-year-old pregnant woman was admitted to a labor and delivery unit with cramping, abdominal pain, vaginal bleeding, and leaking amniotic fluid. Although she was only 27 weeks pregnant, an exam showed that she was in the early stages of labor with a breech baby. In an attempt to stop the preterm labor from progressing, the obstetrician prescribed IV magnesium sulfate, with a bolus dose of 6 g over 30 minutes followed by a continuous infusion of 2 g/hour.

The patient’s nurse obtained a 20 g/500 mL bag of magnesium sulfate from an automated dispensing cabinet. She was unfamiliar with programming a bolus dose using the software in the smart pump. The bolus dose feature allows
Examples of innovation from diverse practice settings
Medication errors main risk to patient safety, says Varadkar

Patients association head says one in 10 are harmed while receiving healthcare

Minister for Health Leo Varadkar has said that medication errors pose the most significant risk to patient safety.
Program Overview

This unique two-day medication safety workshop will be led by ISMP faculty and other selected medication safety experts who, based on their own real-world experiences in establishing and evaluating medication safety programs, will help you maximize your effectiveness in meeting today’s medication safety challenges.
Rank Order of Error Reduction Strategies

Forcing functions and constraints

Automation and computerization with Redundancies

Standardization and protocols

Checklists and double check systems

Rules and policies

Education / Information

Be more careful
Standardise
Incentivise
Computerise
MULTIDISCIPLINARY COLLABORATION