B. PHARM. not BEFORE TIME

At last the standards set by the pharmaceutical educators in Victoria have been recognized, and the efforts of the students rewarded by their elevation to the status of Bachelor of Pharmacy on the completion of their academic course.

The degree has been granted by the Victoria Institute of Colleges, and Wednesday, June the fifth saw the first conferring of degrees in pharmacy in Victoria.

The D. A. Cosser Hall at the Victorian College of Pharmacy was an apt setting for the occasion. Circumstance and colour combined to create a grand occasion.

The graduation ceremonial was conducted by Dr. W. H. Connolly, president of the Institute, and the graduands presented by Dr. G. N. Vaughan, acting Dean of the College.

His Excellency the Governor of Victoria was the Visitor of the Institute. Sir Robb delivered an occasional address during which he pointed out to the graduates the increased responsibilities inherent in the acceptance of increased privilege.

Let us hope that profession at large responds to this new recognition, and that the graduates respond to their elevated status.

50 Years: The Journal notes the awarding of the first B Pharm degrees in Victoria (May 1968).

MEDICATION SAFETY
EDITED BY PENNY THORNTON, BPHARM, CERTHEALTHECON, FSHP

Now under the umbrella of the Committee for Specialty Practice (COSP) in Medication Safety, the aim of the Medication Safety series remains unaltered since 1997: to share stories about errors and near misses with the intention of preventing their recurrence throughout Australian hospitals. Michael Cohen and his USA colleagues created a similar journal column many years earlier with the same aim. With Michael’s encouragement, many of that column’s – now the Institute for Safe Medication Practice (ISMP) newsletter – stories have relevance to our practice in Australia and, blended with local reports, have been shared with our readers to locally predict both current and future opportunities for error.

Use of this valuable strategy of storytelling has morphed into the modern proactive risk management technique of Failure Mode and Effects Analysis (FMEA): taking a hypothetical scenario and asking a clinical team ‘Could this happen here?’ This strategy can be used to change practice incrementally and communicate concerns to clinical teams, consequently enhancing the medication safety culture within an organisation. We now know that regular proactive risk management in this guise is not only a relatively enjoyable pharmacy staff meeting activity, it is also highly valued by hospital accreditation surveyors.

A growing Australian database of local error reports is held securely and Australian hospital pharmacists are encouraged to contribute by submitting details of any error occurring or prevented at their site and share these in the spirit of future prevention through reporting, via email, to medsafety@shpa.org.au. The identity of the reporter will never be revealed and the editor has been known to elaborate the message creatively to de-identify its source without changing the key message. It is believed that through growing readership of this series, the local landscape of medication safety awareness continues to improve.

Read on to explore the inaugural Medication Safety feature →
MEDICATION INCIDENTS

This is the first article in a regular series compiled by the SHPA Committee of Specialty Practice in Drug Distribution. It will initially draw on US experience and include, with permission, material from ISMP Medication Safety Alert! This biweekly bulletin is published by the Institute for Safe Medication Practices, Pennsylvania, USA. Articles selected by the SHPA Committee of Specialty Practice in Drug Distribution are edited to conform with Australian terminology. Further details of the ISMP Medication Safety Alert! can be obtained at the Institute's Web site at http://www.ismp.org/ISMP/.

INTRODUCTION

As we all know, incidents arising out of how drugs are prescribed, dispensed and administered occur only too frequently in hospitals. Details of adverse medication incidents are often made available to facilitate sharing of information and to make pharmacists and other health practitioners aware of situations in which errors may arise. We intend, through this regular page, to alert pharmacists to possible pitfalls in drug treatment which are relevant to Australian practice and hope through this process to facilitate review of medication systems at an individual hospital level so that similar occurrences are prevented.

The Institute for Safe Medication Practices is a non-profit organisation which aims to increase professional awareness of errors with medication. The Institute aims to reduce the likelihood of further errors by disseminating details (without identifying personnel or institutions) and through recommendations for safe practices. The scope of the information includes medication errors and preventable adverse reactions. Incident reports are collected via the United States Pharmacopeia Medication Error Reporting Program, operated in conjunction with ISMP, and from associated international incident reporting programs. I have been nominated through SHPA as the Australian contact for this international network. Through this page, we hope to provide an avenue for hospital pharmacists to share this data worldwide.

We thank Michael Cohen, President, ISMP for his encouragement and support in developing an Australian reporting system.

The following incidents have been reported to ISMP over the past few months. The following extracts from the ISMP Safety Alert bulletin highlight incidents which have relevance to Australian practice. Full text of current alerts is available on the Institute's web site at http://www.ismp.org/ISMP/. There is a link to this site on the SHPA web page.

The COSP in Drug Distribution has selected and edited these extracts. Australian product equivalents have been added where they differ and terminology has been changed slightly for Australian practice. The COSP is interested in acquiring details of Australian incidents (or possible incidents) which readers would like to share with other pharmacists. The COSP will soon have access to data from the Australian Incident Monitoring Study (AIMS). If your hospital is not participating in this study and you would like to share information with other pharmacists, please write to Penny Thornton, COSP in Drug Distribution, c/o Department of Pharmacy, Westmead Hospital, Westmead NSW 2145. (Please do not identify patients or personnel.)

Penny Thornton
Chair
Committee of Specialty Practice in Drug Distribution

USING ORAL SYRINGES WON'T NECESSARILY PROTECT AGAINST INADVERTENT IV INJECTION OF ORAL LIQUIDS

Problem: More and more we're hearing about incidents of inadvertent parenteral administration of liquid substances meant for feeding tubes. Patients who simultaneously have IV lines and small bore polyurethane nasogastric feeding (NG) tubes or percutaneously inserted gastric tubes in place are at risk.

Unfortunately, as presently designed, these small bore tubes have distal ends that accommodate only parenteral luer connections. Therefore, in order to give medications, liquids must either be placed into parenteral syringes by nursing unit personnel, or else special tiny plastic luer adapters must be attached to the tips of otherwise incompatible oral syringes (Baxa Corporation, Englewood, Colorado, USA). The latter are often used by pharmacy to dispense liquid doses. In either circumstance, the danger is obvious. Earlier this month, we received a report about digoxin elixir given IV after a luer adapter was attached to a Baxa oral syringe. Also, the Bayer Pharmaceutical Division mailed a letter to practitioners nationwide about unintended IV ad-
ministration of the contents of Nimotop (nimodipine) capsules, resulting in serious adverse consequences including hypotension, cardiovascular collapse, and cardiac arrest. The letter explained that in situations where the patient is unable to swallow this oral only medication, but has a NG tube in situ, the contents of the capsule may be extracted into a syringe, given via the tube, and washed down with 30 mL of saline. However, in each of these cases, the drug was accidentally given IV rather than via a NG tube.

**Safe Practice Recommendation**
- Whenever a patient has an IV line in place, and simultaneously has any other type of non-IV tubing, a quality assurance process needs to be in place to assure that nurses label the distal ends of all catheters to help identify what tube or catheter is being accessed. This can help prevent accidents whenever tubing can be confused.
- Even with adapters, having pharmacy prepare doses in oral syringes is safer than drawing up medications extemporaneously on nursing units by placing oral liquids into parenteral syringes. However, the risk of inadvertent IV injection still exists whenever luer connectors are attached. To make these safer, the Baxa Corporation provides special labels which depict the word ‘ORAL’ in giant upper case red text. If your pharmacy uses oral syringes, they should always use these labels, affixing them to the syringe plunger before they are dispensed since the syringe can’t be used unless the label is first removed. This makes it hard for anyone to miss that the syringe is for oral use.
- Baxa makes both clear and amber colored (light protective) oral syringes. We recommend that amber syringes be used. This helps to set them apart from parenteral syringes which are clear — an additional layer of safety.
- Obviously, the sooner tubes and catheters are removed, the safer it is for the patient. Work with staff to get IV lines out as soon as possible, especially when patients simultaneously have feeding tubes in place. This can’t always be done, but many patients still have IV lines in place when they aren’t absolutely necessary.
- Nurses must review medication administration records and drug labels before administering any medication. If the route of administration is spelled out on the patient’s administration record and/or on the dispensed drug label, the additional mention of the proper route of administration may alert staff.
- There is a serious need for hospitals to consider this problem and work proactively to prevent accidents by educating staff and working together to evaluate equipment and develop standards. Feeding tubes and IV catheters should be as incompatible with one another as kerosene fuel lines are with gasoline tanks. If device manufacturers can’t do this on their own, then regulatory authorities such as the FDA [TGA devices branch?] should take a leadership role. [ISMP Medication Safety Alert!, 14 August 1996]

**COMPUTER GLITCH LEADS TO ERROR**

**Problem:** An unusual computer problem led to a medication error in a hospital where the pharmacy department prints a medication profile summary nightly for placement in the front of each patient’s chart. A patient who was being transferred from the acute part of the hospital to the skilled nursing area needed transfer orders. The patient’s attending physician was on vacation at the time, so the nurse asked the covering physician to rewrite the orders. He wrote the orders using the medication profile summary provided by the pharmacy. Unfortunately, when this summary sheet was printed the night before, the computer somehow combined two patients’ medications on the same profile. Therefore, the patient received another patient’s medications along with her own, even though she protested to the nurse that she wasn’t supposed to take the added medications. The patient, who was asthmatic, ended up receiving a β-blocker and developed complications requiring transfer to a critical care unit and an extended hospitalisation.

**Safe Practice Recommendation**
As we all know, the availability of computerised systems does not assure that software or hardware problems won’t occasionally lead to errors. Medical decisions, including prescribing of medications, should only be based upon knowledge of each patient’s condition. In this case, if the covering physician was not familiar with the patient, a review of the patient’s chart would have allowed him to quickly determine that prescribing a β-blocker was inappropriate due to the patient’s asthma condition. Perhaps this would have even led to the discovery of the overall computer problem. Also, any time a patient protests a medication, listen to what the patient is saying and be sure to provide yourself and the patient with an adequate explanation before proceeding. [ISMP Medication Safety Alert!, 14 August 1996]

**AVAILABILITY OF A WIDE RANGE OF WARD STOCK MAY CIRCUMVENT SAFE ORDER REVIEWS BY PHARMACY**

**Problem:** A transcribed telephone order was received in the pharmacy the morning after it had been
written. It read, ‘Give Adalat Oros 30 mg PO q4H’. When a pharmacist asked the patient’s nurse if she knew why the long acting form was ordered q4h, she told him the doctors had been discussing a published meta-analysis showing increased risk of myocardial infarction in patients receiving immediate release nifedipine. The nurse mentioned that the physicians were in agreement that from now on they would only use long acting nifedipine (Adalat Oros).

The pharmacist told the nurse that Adalat Oros was an entirely different type of medication than ‘regular’ Adalat. He explained that giving that much of the drug over a day might have harmful consequences. The pharmacist decided not to send any more until the order was clarified. However, the patient, who had received three doses, had already been discharged. The nurse explained that she got the doses from ward stock.

The nurse was sure that Adalat Oros had been ordered, particularly in light of the statement about immediate release Adalat. When challenged, the physician did not remember ordering the controlled release form of the drug but could not be positive because it was midnight when the order was given. In any event, the patient was followed up by phone and thankfully had no adverse effects from the Adalat Oros.

**Safe Practice Recommendation**

There is, of course, current literature attacking immediate release calcium channel blockers, and, therefore, we may see an increase, appropriate or not, in use of the controlled release form. Obviously there is some in-house education that is required about the differences in the dosage forms. However, the biggest problem here is that, with availability of a wide range of drugs on ward stock, the checks and balances of a pharmacist’s review of the medication order can easily be circumvented. The answer, but probably not the solution, to this misadventure would be to remove non-essential drugs from ward stock. Given that Adalat Oros is an extended release form, unsuitable for rapid control of blood pressure, and that a patient admitted on this drug would be unlikely to need a dose urgently, inclusion as ward stock is questionable. [ISMP Medication Safety Alert!, 14 August 1996]

**DESPITE KNOWLEDGE OF ACCIDENTS, OPPORTUNITIES FOR POTASSIUM ADEs PERSIST**

**Problem:** Despite widespread coverage of potassium chloride-related deaths in professional journals, newsletters, and the lay press, some US hospitals still have not established necessary controls to optimise the safe administration of this drug. A close call last week at a children’s hospital illustrates why hospitals must be proactive rather than reactive when addressing this issue. A pharmacist received a call from a paediatric nurse who wanted to know if there were smaller IV bags for 0.45% saline than 1000 mL. The pharmacist informed her that there were and asked why she wanted to know. The nurse stated that she had to give an IV medication and wanted to use the least expensive bag. The pharmacist told her that there was little difference between the costs of the various IV bags, and not enough to justify sending up a smaller bag specifically for her purpose. As the nurse was about to hang up she mentioned: ‘It’s just that I have 20 mEq of potassium to give in 30 mL over one hour and don’t want to waste all that fluid’. Instant chaos!

The pharmacist asked who the potassium was for and was told that a surgical resident had written this order for a 23-day-old. A child of this size and age would ordinarily receive just 3 mEq of potassium per kg per day! The nurse was instructed not to hang the IV and to wait until the pharmacist called the surgical resident. Although the resident initially failed to see what the problem was, when told of the correct dose and the possible consequences of a 20 mEq dose of potassium given over one hour, he readily agreed to cancel the order and check with the paediatric attending physician regarding what dose of potassium, if any, should be given.

Administering 20 mEq of potassium most likely would have killed the child. The fact that the potential medication error was intercepted by the pharmacist is commendable, but the situation begs the bigger question of how this even came so close to being a serious adverse drug event. Obviously, the surgical resident was not completely familiar with fluid and electrolyte therapy in children. Still, that is probably not all that uncommon among non-paediatricians. The information was passed on to the Medical Director for Pediatrics, and that matter will be handled there.

How did the nurse happen to have 20 mEq of potassium? The answer is quite simple — she took it from another patient’s medication drawer. For dehydrated paediatric patients, orders are commonly written at the hospital to ‘add 20 mEq of potassium to IV after child begins to urinate’. The pharmacy in the hospital where this happened routinely sends vials of 20 mEq potassium chloride injection to the floor for such patients. Potassium injection is also readily available for dispensing from automated dispensing modules (in this case Pyxis), located near many of the paediatric nursing floors.
Safe Practice Recommendation

The pharmacy recently instituted a new potassium policy for this hospital. Potassium will not be kept as floor stock anywhere in the hospital except in the neonatal and paediatric intensive care unit. Pyxis machines where special packaging and controlled storage is used. Further, potassium will not be sent to the nursing floors for patient orders, and all potassium-containing IVs must be either manufacturer-prepared or, when the desired concentration is not available commercially, pharmacy-prepared. A policy is being written that will specify exactly what amounts of potassium may be safely administered on the nursing floor. In addition, paediatric nursing will receive in-servicing on the policy and the safe administration of potassium.

Will any of this totally eliminate the possibility of potassium being administered in an incorrect, and possibly dangerous manner? Experience suggests that the answer to that is ‘no’, but even if you can’t stop the train at least you can drag your legs. Will this policy meet with some resistance from nurses who feel, and rightly so, that there are more and more restrictions to performing patient care? Yes, it probably will. However, any of us would be willing to suffer the slings and arrows of an angry professional if it means a patient, and particularly a young child, is a little safer.

[ISMP Medication Safety Alert, 28 August 1996.]

NEW STRATEGIES REQUIRED TO PREVENT ESMOLOL-RELATED ACCIDENTAL DEATHS

Problem: In 1995, after a series of accidental deaths resulting from the misuse of Brevibloc (esmolol) ampoules by hospital personnel, the drug’s manufacturer, Ohmeda Pharmaceuticals [Boots — Australia], notified pharmacists of packaging changes designed to minimise confusion. Fatalities were reported when the concentrated form of the drug, packaged in 2.5 g ampoules and meant for dilution, had been given as a direct IV push injection instead of the 100 mg, 10 mL vial which is supposed to be used for the loading dose. New packaging includes a ‘black box’ warning on the ampoule and storage carton as well as a bright red flag on the ampoule bulb. Both warn that the product must be diluted before administration.

Unfortunately, two new esmolol-related accidents indicate that other strategies are required to prevent further deaths. Last month, an operating theatre nurse used one of the newly packaged ampoules instead of the vial to prepare a loading dose. The patient arrested, was resuscitated, but suffered permanent CNS impairment. In a second case, an intern working in an ICU decided to use esmolol for a patient with supraventricular tachycardia. He prescribed a loading dose of 500 μg/kg but did not calculate the dose. The dose was then miscalculated by other ICU personnel. An ampoule was used to prepare a syringe, and the contents were injected directly. The patient later died. Again, this involved the new packaging with warnings and an auxiliary label affixed. Therefore, the new packaging is not an adequate deterrent, and it appears that errors will continue despite the company’s attempts to clarify the labelling.

Safe Practice Recommendation

In order to reduce error potential, wherever possible, esmolol ampoules should not be available in patient care areas. Ampoules should remain in the pharmacy for use only in preparing infusions. The only way the problem will be overcome entirely is to remove the ampoule dosage form from the market and replace it with a premixed drug. While the company is considering such a move, it is unknown how long it will be before such a product is marketed. Stability problems prevent pharmacists from preparing doses themselves for distribution to patient care areas far in advance of their need. [ISMP Medication Safety Alert, 25 September 1996]

REVISE INSULIN ADMINISTRATION PROCEDURES AND EDUCATE FOR SMOOTH TRANSITION TO INSULIN LISPRO

Problem: Insulin administration timing errors have been occurring in some hospitals where Azu’s new recombinant DNA origin insulin lispro (Humalog) is in use. Since regular insulin and insulin lispro are not interchangeable, hospitals using the new product are forced to carry both types.

While the new product is equipotent to regular insulin, it has a faster onset and shorter duration of action and, therefore, should be given closer to meal time than regular insulin (within 15 minutes vs 30 minutes). Problems are occurring when health care personnel fail to take into account the differences in onset and duration after injection. For example, patients receiving insulin lispro 30 minutes before breakfast, as they would regular insulin, may develop hypoglycaemia.

Concern has also been raised about confusion between insulin lispro’s brand name, Humalog, and the brand name used for Azu’s regular human insulin, Humulin. A hospital recently reported that a nurse mistakenly misread an order for Humalog as Humulin. The nurse took Humulin from ward stock and the patient received several doses before the error was discovered.
Safe Practice Recommendation
Based on information from hospitals with early experience in using this product, if insulin lispro will be used, at your location, consider doing the following:
- Continue to use regular insulin for IV infusions, TPN solutions, insulin pumps, sliding scale orders, etc.
- In the hospital, consider reserving insulin lispro for patients who require intensive insulin therapy or for those already stabilised on it.
- Before insulin lispro is used, education of all health care personnel (including consultants) is essential. This should take place through newsletters, memos and discussions.
- Insulin lispro should not be added to floor stock or automated dispensing devices but dispensed only for specific patients with appropriate pharmacy labelling.
- Adjust insulin policies and procedures to call for insulin lispro administration at the start of a meal.
- Insulin lispro should have pharmacy labelling that states 'administer with meals', or something similar.
- Consider using special coloured labels for insulin lispro to set it apart from regular insulin.
- Warn staff NOT to order insulin lispro by its brand name, Humalog. As mentioned, early reports concerning confusion with Humulin have been received. Actual mix-ups have occurred as well.
- Educate patients about proper insulin administration times. Where practical, consider having patients see the actual containers to confirm insulin type. [ISMP Medication Safety Alert!, 23 October 1996]

NAME CONFUSIONS
- A letter in a recent issue of New England Journal of Medicine calls attention to a medication error involving a mix-up between Prozac (fluoxetine) and Prilosec (omeprazole, Losec — Australia). The gastric ulcer patient received Prozac by mistake and developed a gastrointestinal bleed. The two drugs look alike when poorly written, and have overlapping dosages, same route of administration, etc.

[Note also the potential for name confusion in Australia between Losec (omeprazole) and Lasix (frusemide).]

The author recommended that generic names be used in prescriptions to reduce error potential. We recommend that extra caution be taken when screening prescriptions for either drug, always taking into account the patient's condition. Several other reports of this name pair mix-up are contained in the USP's Medication Errors database and the FDA MEDWATCH database.

- Watch out for mix-ups between the anticonvulsant Lamictal (lamotrigine) and Lamisil (terbinafine), a new oral antifungal. While we have yet to actually receive any such reports, we have heard from pharmacists who are concerned because the two drug names look and sound so similar. The dose might not help in differentiating between the two drugs because one of Lamisil's tablet strengths is 250 mg, which could be mistaken for Lamictal's 200 mg tablet. PRINT new prescriptions. If phoned, be sure that the name of the drug is spelled. Also, be careful with terbinafine and terfenadine (Teldane) prescriptions if the generic names are used. [ISMP Medication Safety Alert!, 28 August 1996]

- After a patient admission for recurrence of fever, facial swelling, conjunctivitis, and rigors, it was discovered by the attending physician, when examining the patient's medications, that his HIV positive male patient had been taking lamotrigine (Lamictal) 150 mg twice daily instead of lamivudine (3TC) 150 mg. The incorrect medication had been dispensed by an outside pharmacy. Apparently the patient had suffered from an identical symptom complex one month earlier, when lamivudine was originally prescribed. The symptoms were considered a result of lamotrigine allergy. The patient was placed on corticosteroids and soon improved.

To reduce confusion, both brand and generic names should be used in prescribing these drugs. Store the drugs apart from one another and develop computer mnemonics that will preclude mix-ups during computer order entry. [ISMP Medication Safety Alert!, 11 September 1996]

PACKAGING CONFUSION
- A 63-year-old female patient suffered stomach perforation after ingesting a blister-packed capsule while hospitalised for depression. PRN medication had been left at the bedside. Since the patient had not shown any signs of confusion or disorientation, she was left to open the packaging on her own but failed to realise the necessity of doing so. On laparotomy, an artery within the stomach was found to be injured, and the lesser gastric curvature perforated by the blister wrap's sharp edge (Lurton A, et al. Stomach perforation by a blister wrapped capsule. N Engl J Med 1996; 335: 754).

Medications shouldn't be left at the bedside but, in reality, under certain circumstances it occurs. If necessary, patients should demonstrate their understanding and ability to unwrap blister-packed items. For patients unable to manipulate the packaging on their own, a partially opened blister may be left in a medicine cup. [ISMP Medication Safety Alert!, 11 September 1996]