



Syringe mix-ups lead to fatal intrathecal administration of IV vinCRISStine

Since 1989, ISMP has been writing about erroneous intrathecal (via the spinal route) administration of IV vinca alkaloids, primarily vinCRISStine. Vinca alkaloids are a class of chemotherapy used to treat various cancers, including lymphoma, non-Hodgkin's lymphoma, and leukemia. Besides vinCRISStine, other vinca alkaloids are vinBLASStine, vinorelbine (NAVELBINE) and vindesine (an investigational drug in the US).

Vinca alkaloids are intended for IV administration only. However, they are often given simultaneously with other chemotherapy, such as methotrexate, which is administered intrathecally to prevent the spread of cancer to the central nervous system. Because the volume of the vinca alkaloid and the methotrexate dose is so small, each drug may be dispensed in a syringe. Vinca alkaloids are also considered vesicants, which can cause severe tissue damage including blistering, sloughing, and necrosis, if the drug gets into the tissue instead of the vein during administration. Thus, practitioners carefully control the flow of administration and monitor the patient closely during IV administration of the drug.¹ Unfortunately, dispensing both IV vinca alkaloids and intrathecal (IT) medications in syringes has led to a number of tragic syringe mix-ups in which the IV vinca alkaloids were inadvertently administered intrathecally, with fatal results.

We recently learned of two incidents involving the erroneous administration of IV vinca alkaloids via the IT route—one involving vinCRISStine

and another involving vindesine—both resulting in the patients' death.

In one case, a 25-year-old woman being treated for non-Hodgkin's lymphoma died after receiving vindesine intrathecally.² Her physician had confused a syringe of IV vindesine with a syringe of methylPREDNISolone intended for IT administration.

We have no details to share about the second case, except that the patient died after receiving IV vinCRISStine intrathecally.

Victims of these errors suffer enormous pain, often knowing they may have just days to live.

To cite another case, late in 2006, we received a report about a 21-year-old man receiving chemotherapy to treat lymphoma. He died 3 days after receiving the wrong medication intrathecally. It appears that chemotherapy meant for another patient was delivered to his bedside. The physician injected IV vinCRISStine into the patient's spine thinking it was another chemotherapy drug that can safely be given intrathecally.

When given intrathecally, vinca alkaloids can cause irreversible, life-threatening outcomes. Patients rarely survive this error, as it leads to progressive ascending myeloencephalopathy (inflammation and destruction of the spinal cord and the brain). Initially, the nerves that control the distal lower extremities are affected, causing leg weakness, pain, and a sharp ankle jerk reflex. As symptoms slowly and painfully progress, autonomic dysfunction occurs including urinary retention, neck stiffness, fever, and respiratory depression.³ Tragically, victims of these errors suffer enormous

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check it out! ✓✓✓✓

To prevent the inadvertent intrathecal (IT) administration of vinCRISStine:

- ✓ **Restrict route in computer.** Restrict the vinCRISStine route of administration to IV only in the pharmacy and prescriber order entry systems.
- ✓ **Use mini-bags.** Prepare diluted vinCRISStine for IV bolus administration in a small-volume IV bag instead of a syringe to prevent confusion with IT syringes. Bedside monitoring of patients is still crucial given the risk of harm from extravasation.
- ✓ **Warn with labels.** We recommend applying a label on all vinca alkaloids stating "For IV use only. Fatal if given by other routes."
- ✓ **Finish IV drugs before IT drugs.** For patients receiving an IT medication along with an IV vinca alkaloid, have pharmacy dispense the IT medication only after the empty bag of IV vinca alkaloid has been returned to the pharmacy.
- ✓ **Deliver separately.** Ensure the pharmacy never delivers IT and IV medications together at the same time, in the same bag, or to the same location.
- ✓ **Store separately.** Establish a list of drugs that can be administered IT (or epidurally) and ban all other injectable drugs from rooms where lumbar punctures or IT medication are administered.
- ✓ **Double-check.** Have at least two healthcare professionals independently verify all IT doses before administration.

to the point

➔ **"Organizations learn only through individuals who learn."**

---Peter Senge

Syringe mix-ups lead to fatal intrathecal administration continued from page 1

pain both physically and mentally, often knowing they may have just days to live.

As early as 1991, the Food and Drug Administration (FDA) and United States Pharmacopeia (USP) established standards requiring explicit labeling of vinCRISStine syringes stating “FATAL if given intrathecally. FOR IV USE ONLY.” (We have recommended changing the label to state “For IV use only. Fatal if given by other routes,” since presence of the word “intrathecal” on the current labeling has contributed to mix-ups.) FDA and USP also recommended placing all syringes in an overwrap with an additional warning label, and prohibiting IV medications in areas where IT medications are administered. In 2003, because of continued reports of IT administration of IV vinCRISStine, ISMP also recommended dispensing diluted IV vinCRISStine in a mini-bag to differentiate it from IT medications dispensed in syringes.¹

In December 2005, ISMP conducted a survey⁴ pertaining to dispensing and administration practices with IV vinCRISStine, focusing on FDA, USP, and ISMP recommendations. We found that less than a quarter of the 418 respondents were dispensing vinCRISStine in a mini-bag, and half were dispensing the drug in syringes.

We also found that 7% of all respondents were not complying with FDA and USP requirements for affixing special warnings labels on prepared doses of IV vinCRISStine. Only one-third of respondents prohibited IV vinCRISStine in areas where IT medications were being administered. (Full survey results can be accessed at: www.ismp.org/survey/vincristine/Reports.asp.)

We urge you to implement the safety recommendations summarized in the **check/itout!** column on page 1, which are endorsed by ISMP, The Joint Commission,⁵ and the World Health Organization.⁶ These tragic events are preventable, and safety steps should be taken immediately to ensure this potential error does not occur in your organization.

References: 1) Polovich M, et al (Ed.). Chemotherapy and biotherapy guidelines and recommendations for practice (2nd ed.). 2005; Pittsburgh: Oncology Nursing Society. 2) Anon. Death due to intrathecal vindesine. *Prescribe International* 2008; 17:153. 3) Langman JL, et al. Inadvertent intrathecal administration of vinCRISStine. *Community Oncology* 2007; 4(1):45-46. 4) Institute for Safe Medication Practices. IV vinCRISStine survey shows safety improvements needed. *ISMP Medication Safety Alert!* 2006; 11(4):1-2. 5) Joint Commission on Accreditation of Health Care Organizations. Preventing vinCRISStine administration errors. *Sentinel Event Alert* 2005; Jul 14:1-3. 6) The World Health Organization. Information Exchange System. Alert No. 115. July 18, 2007. Accessed at: www.who.int/medicines/publications/drugalerts/Alert_115_vincristine.pdf.

Double Trouble Humira Pen and HumaPen

✓ **HUMAPEN MEMOIR** is a pen device that was recently launched by Lilly in 2007, exclusively for use with **HUMALOG** (insulin lispro injection [rDNA origin]) 3 mL insulin cartridges. It is advertised as the first and only insulin pen with a memory. The pen records the date, time, and amount of the last 16 doses of insulin the patient has administered with the device. The ability to record doses of insulin and times meals were eaten can help patients, diabetes educators, and physicians who are developing a diabetes treatment plan that requires an accurate recording of mealtime doses. Don't confuse this product with **HUMIRA PEN** (adalimumab), which is used to treat immune-related disorders such as moderate to severe rheumatoid arthritis in adults, psoriatic arthritis, ankylosing spondylitis, and moderate to severe Crohn's disease. Humira is also approved for adults who have lost response to, or are unable to tolerate, **REMICADE** (infliximab), another immune modulating agent. Both brand names—HumaPen and Humira Pen—look and sound nearly identical. Matching the prescribed medication's indication to the patient's condition will help point out any errors in interpreting orders for these products with look-alike names.

safetywires

⚡ Colors for wristbands.

Recently, the American Hospital Association (AHA) has taken steps to nationalize a color-code system for patient wristbands. In 2006, we published an article about a hospitalized patient with a history of a latex allergy. The patient was given a green bracelet which, at that particular hospital, signaled a latex allergy. During his stay, he was transported to a diagnostic center for a test. Staff at the center were not aware the green wristband signaled a latex allergy and performed the test using latex-containing vials/syringes. The patient experienced an anaphylactic reaction and required emergency treatment. In another event, a patient was incorrectly identified as DNR (do not resuscitate) during an arrest. A nurse had placed a yellow wristband on the patient which, in this hospital, designated DNR, but in another hospital where the nurse worked, it signified a “restricted extremity” that should not be used to draw blood or for IV access. Luckily the mistake was quickly realized and the patient was rescued. AHA is asking all hospitals to consider using three standardized colors for alert wristbands: **red** for patient allergies; **yellow** for a fall risk; and **purple** for do-not-resuscitate patient preferences. Several states have already adopted these colors by consensus.

⚡ **“C-IV” mistaken as “IV.”** A nurse working in radiology almost administered chloral hydrate syrup intravenously when she confused the Roman numeral IV in the Drug Enforcement Agency (DEA) class four controlled substance symbol (C-IV) as “intravenous” (see photo on next page). The label does not specify that the syrup is for oral administration. Further, the label states “DILUTE BEFORE USING,” which could erroneously cue nurses that the drug should be administered IV. The dose cup of chloral hydrate had been obtained from an automated dispensing cabinet (ADC); the ADC screen

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Prepare patients for warfarin dose changes by telephone

A patient who was taking warfarin required numerous dose changes to maintain a therapeutic level. Whenever a change was needed, the patient had always been told how many of his 5 mg tablets to take. However, on one occasion, the patient was called and told to take “7 and ½” mg daily. He misunderstood the directions and took 7½ of the 5 mg tablets (37.5 mg total) for 2 days. Fortunately, the error was discovered before serious harm resulted.

Dosing changes with warfarin are often communicated verbally to a patient after a healthcare provider has reviewed outpatient INR levels. However, just as verbal orders to clinicians pose a risk, so do verbal directions given to a patient. With warfarin, the directions on the prescription bottle may differ from the changing administration directions, adding to the potential for confusion.

To reduce the risk of an error, discharge teaching for patients on warfarin should include instructions on how to safely obtain verbal dose changes. The patient should be taught to:

- Retrieve a pen and paper to write down the instructions when the clinician calls
- Tell the clinician the mg strength of warfarin tablets currently available with his/her most recent prescription
- Write down the information received, including the date and the name of the clinician who gave the information
- Read back the dose and instructions to verify understanding, giving the daily mg dose first, then the instructions regarding the number of tablets to take for each dose
- Keep the dated instructions with the prescription bottle for quick reference.

nice to Know...



Two free resources for nurses

■ The Agency for Healthcare Research and Quality (AHRQ) and the Robert Wood Johnson

Foundation (RWJF) have jointly sponsored the development of a new patient safety resource, **Patient Safety and Quality: An Evidence-Based Handbook for Nurses**.

This free, three-volume, 1,400-page handbook for nurses comprises six sections: Patient Safety and Quality; Evidence-based Practice; Patient-centered Care; Working Conditions and the Work Environment for Nurses; Critical Opportunities for Patient Safety and Quality Improvement; and Tools for Quality Improvement and Patient Safety. You can review the publication online (www.ahrq.gov/qual/nursesfdbk/) or obtain a print copy or CD-ROM by sending an email request to: ahrqpubs@ahrq.hhs.gov.

■ The RWJF has released a free toolkit, **Transforming Care at the Bedside** (TCAB) to help engage nurses and leaders at all levels of the organization to improve the quality and safety of patient care on medical and surgical units. One of the characteristics that sets TCAB apart from a traditional quality improvement program is its focus on engaging frontline staff and unit managers. The toolkit builds upon recognition that ideas for transforming the way care is delivered on medical and surgical units must come from nurses and other care team members who spend the most time with patients and their families. To view the toolkit, visit: www.rwjf.org/pr/product.jsp?id=30051&c=EMC-CA137.

Special Announcement

ISMP teleconference. Have you considered how medication use can increase the frequency of patient falls? What medications contribute to this risk? What type of medication-related strategies should your organization implement to reduce the risk patient falls and possible injury? Learn the answers to these questions and more in our final teleconference in 2008, **Patient Falls and Medication Use: Making the Safety Connection**, scheduled for **November 20**. For details, visit: www.ismp.org/educational/teleconferences.asp.

safetywires continued from page 2

did not list the route of administration. The second nurse who was performing an independent double-check learned the first nurse had planned to give the drug IV, catching the error before it reached the patient. In radiology, nurses did not use medication administration records to guide drug therapy. Instead, they were supposed to bring the prescriber's order to the medication preparation area and to the patient's bedside when preparing and administering medications. In this case, the nurse was



relying on memory to prepare and administer the dose, not the orders. We previously reported similar errors involving misinterpretation of this symbol (C-IV): one in which a nurse administered a prescribed IM dose of phenobarbital by the IV route, and another in which a nurse crushed diazepam tablets, dissolved them, and administered the dose IV. For those with in-house newsletters, it's a good idea to occasionally publish and explain

these symbols. The Code of Federal Regulations allows companies to use Arabic numerals instead of Roman numerals on labels to decrease the chance of an error. We encourage companies that package C-4 controlled substances to heed this advice.

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Report medication errors to ISMP at 1-800-FAIL-SAF(E).

Survey on practice site distribution of the *ISMP Nurse Advise-ERR*®

We need the **help** of the individual who receives the initial copy of this newsletter at each practice site to understand how it's received and redistributed within your organization. The survey will take just a few minutes to complete and will give us the information we need to continually increase distribution of medication safety practice recommendations to even more nurses. **We would greatly appreciate just ONE RESPONSE from each hospital/facility BY THE PERSON WHO RECEIVES THE NEWSLETTER INITIALLY, regardless of whether you redistribute it to others.** Please submit your responses by **November 21, 2008**, via our website at: www.ismp.org/survey/NurseSurvey200810.asp (or by fax to 215-914-1492 only if you do not have Internet access). Thank you!

1 As the person who receives the initial copy of the newsletter, what is your professional role? (check one)

Nurse - **If yes, please note level:** Staff Manager Administrator Other
 Pharmacist - **If yes, please note level:** Staff Manager Administrator Other
 Physician - **If yes, please note level:** Staff Manager Administrator Other
 Educator - **If yes, choose:** Academic setting Patient care setting
 Administrator (other) Risk/Quality Manager Patient/Medication Safety Officer Industry/Regulatory
 Other (please identify) _____ Don't know if I receive the initial copy of the newsletter in my facility

2 Do you redistribute the newsletter after it is received? Yes _____ No _____ If no, skip to question # 6

3 As a general pattern, how do you redistribute the newsletter to others? (check one)

Send all issues Send selected issues Send selected items
 Other (specify) _____

4 Please estimate how many people in each category actually receive each issue (or selected items) of the newsletter after redistribution in your facility. (please give a number for all categories of staff)

Staff nurses Educators
 Nurse managers or administrators Students
 Staff pharmacists Staff physicians
 Pharmacy managers or administrators Physician managers or administrators
 Risk management staff Respiratory therapists
 Quality management staff Others

5 Place a checkmark next to each method used to distribute newsletter information. (check all that apply)

Fax Email Internal intranet Internal website Bulletin board Sent with meeting minutes
 Sent through an internal newsletter Copied and sent to individuals/departments Other (specify) _____

6 What topics would you like to see covered in future editions of the newsletter? _____

7 Please describe your organization. (check all that apply)

Hospital - **please note bed size:** Below 100 beds 101-200 beds 201-350 beds 351-500 beds Over 501 beds
 Outpatient/Community-based provider Academic setting Other (specify) _____

8 Tell us your thoughts about the newsletter by checking the box that best describes your opinion.

Statements about Content	Disagree-----Agree				
	1	2	3	4	5
a The newsletter increases my understanding of the causes and prevention of medication errors.					
b The recommendations for medication error prevention are practical and helpful.					
c The information is relevant to my practice <u>OR</u> to whom I distribute the newsletter.					
d I have used information from the newsletter to make changes in my individual practice.					
e Information from the newsletter has been used to make system changes in my facility/unit.					

Please submit responses to ISMP at: www.ismp.org/survey/NurseSurvey200810.asp or by fax (215-914-1492) by **November 21, 2008**.

Thank you for participating!