

## ISMP Medication Error Report Analysis

### Avoid Confusion With *Torisel* Dose Preparation

### Remove Vials From Cartons

### Sumatriptan Confused With Sitagliptin

### Misdispensing of *Purinethol* Instead of Propylthiouracil: A Preventable Disaster

Michael R. Cohen, RPh, MS, ScD, FASHP\*

These medication errors have occurred in health care facilities at least once. They will happen again—perhaps where you work. Through education and alertness of personnel and procedural safeguards, they can be avoided. You should consider publishing accounts of errors in your newsletters and/or presenting them in your inservice training programs.

Your assistance is required to continue this feature. The reports described here were received through the United States Pharmacopeia (USP) Medication Errors Reporting Program (MERP), which is presented in cooperation with the Institute for Safe Medication Practices (ISMP). If you have encountered medication errors and would like to report them, you may call USP toll-free, 24 hours a day, at 800-233-7767 (800-23-ERROR).

Any reports published by ISMP will be anonymous. Comments are also invited; the writers' names will be published if desired. ISMP may be contacted at the address shown below.

Errors, close calls, or hazardous conditions may be reported through the ISMP ([www.ismp.org](http://www.ismp.org)) or USP ([www.usp.org](http://www.usp.org)) Web sites or communicated directly to ISMP by calling 800-FAIL-SAFE or via e-mail at [ismpinfo@ismp.org](mailto:ismpinfo@ismp.org). ISMP guarantees the confidentiality and security of the information received and respects reporters' wishes as to the level of detail included in publications.

is added to the active drug for a total volume of 3 mL or 10 mg/mL. Although not explicitly stated in the package insert, vial labeling, or label flags (see Figure 1), there is a 20% overfill meant to accommodate withdrawal of medication from the vial. The full 30 mg amount in the vial should not be withdrawn. The 25 mg dose (2.5 mL) should be drawn up and added to 250 mL of 0.9% sodium chloride and infused over 30 to 60 minutes. Infusion solutions should be dispensed in glass, polypropylene, or polyolefin containers and administered through nonsorbing (eg, polyethylene or other non-polyvinyl chloride) tubing.

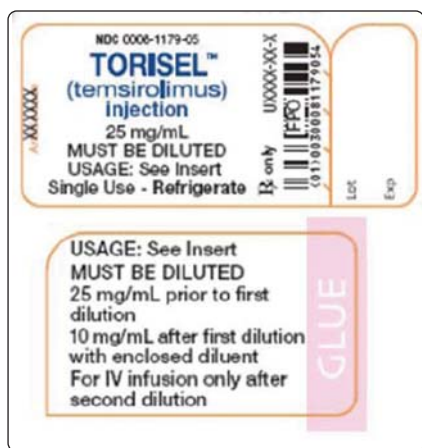
Another cause for concern with the preparation of *Torisel* surfaced recently. In the instance reported, pharmacy staff did not realize that by adding the diluent to the vial containing active drug, the resulting concentration would be 10 mg/mL instead of 25 mg/mL as marked on the *Torisel* vial label. When the dose was drawn up, only 1 mL (10 mg) was removed instead of 2.5 mL (25 mg). When the phar-

#### AVOID CONFUSION WITH *TORISEL* DOSE PREPARATION

*Torisel* (temsirolimus) injection, which is used for the treatment of advanced renal cell carcinoma, is distributed in a kit that contains a vial of active drug along with a vial of diluent. The active

drug is supplied in a vial that contains 30 mg in a total volume of 1.2 mL (25 mg/mL). However, the vial is labeled 25 mg/mL, and the drug is given in a fixed dose of 25 mg. The diluent vial contains 1.8 mL.<sup>1</sup> To prepare the drug for administration, 1.8 mL of diluent

\*President, Institute for Safe Medication Practices, 1800 Byberry Road, Suite 810, Huntingdon Valley, PA 19006; phone: 215-947-7797; fax: 215-914-1492; e-mail: [mcohen@ismp.org](mailto:mcohen@ismp.org); Web site: [www.ismp.org](http://www.ismp.org).



**Figure 1.** Labels for *Torisel*.

macist checked the final product, she compared the amount drawn up (1 mL) with the *Torisel* vial (labeled 25 mg/mL) and concluded that the correct dose had been withdrawn. This resulted in the patient receiving less than the ordered dose (ie, 10 mg instead of the intended 25 mg). Later, the error was discovered by a staff member who correctly prepared the product with 2.5 mL of the final solution and pointed out the instructions in the package insert to the checking pharmacist.<sup>2</sup>

A recent US Department of Veterans Affairs bulletin to veterans affairs (VA) employees provided information about *Torisel* concentrations before and after dilution. It called for pharmacists to keep the package insert with the full instructions for dilution of *Torisel* with the vials of both active drug and diluent because no instructions appear on the vials themselves. The bulletin also suggested warning systems to notify staff of the change in concentration when preparing the final dilution of *Torisel* (ie, computer alerts during the ordering/verifying process and/or warning stickers on packaging).<sup>3</sup> The US Food and Drug Administration (FDA) is aware of

the situation.

The Institute for Safe Medication Practices (ISMP) suggests a change in vial labeling to state 30 mg/3 mL (10 mg/mL) after dilution with enclosed diluent. If the product is dispensed before preparation is completed in the pharmacy, the diluent and active drug must always be dispensed in 1 package with supplemental instructions.

### REMOVE VIALS FROM CARTONS

During ISMP medication safety system consultations, patient care units in acute-care facilities are regularly visited. One safety concern that is occasionally encountered is the practice of storing insulin vials inside open cartons, which come along with the product when dispensed by the pharmacy. The ISMP recommends that these external packaging cartons be discarded before dispensation or at the time of receipt on the nursing unit. This should be done whether insulin vials are labeled for specific patients or placed into floor stock. Otherwise, vials may be returned accidentally to a mismatched carton after use, a condition that sets the stage for a serious insulin mix-up if the product is identified by the outer carton instead of the label. To prevent patients from getting the wrong insulin product from mismatched vials and cartons, do not dispense from or store insulin vials in cartons on patient care units.

### SUMATRIPTAN CONFUSED WITH SITAGLIPTIN

A pharmacist told the ISMP recently about an automated dispensing cabinet (ADC) misfill that occurred in his hospital when sumatriptan (*Imitrex*) 25 mg tablets were placed into a matrix drawer intended for sitagliptin (*Januvia*) 25 mg tablets. Both med-

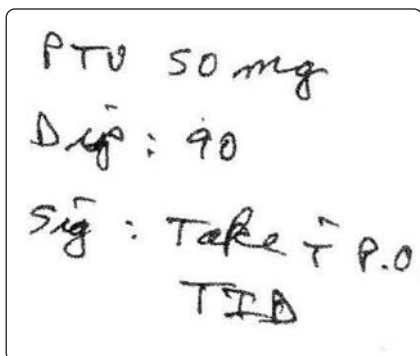
ications are manufactured in 25, 50, and 100 mg tablets, and their generic names feature the same first and last letters and have a somewhat similar pronunciation. Fortunately, a nurse recognized the error before administering the migraine medication to her patient, who was supposed to receive *Januvia* in conjunction with other therapy for diabetes. The pharmacy decided to publicize the event in its department newsletter and also moved forward with plans to acquire a bar-coding system for use when replenishing ADC stock. Although this is the first reported mix-up regarding these 2 drugs sent to the ISMP, it is a worthwhile to caution readers.

### MISDISPENSING OF PURINETHOL INSTEAD OF PROPYLTHIOURACIL: A PREVENTABLE DISASTER

Dispensing *Purinethol* (mercaptopyrimidine) instead of propylthiouracil (PTU), especially at high doses, is likely to cause harm (eg, teratogenicity if taken by pregnant women, bone marrow suppression, hepatotoxicity, immunosuppression).

ISMP learned recently about a tragic case in which a pregnant woman was given a prescription for PTU (see Figure 2) early in her pregnancy but received *Purinethol* in error on a subsequent refill. Just after the first report of this mix-up was processed, ISMP learned of a second, almost identical case.

Although the drug names appear quite distinct, both names start with *P* and end with *L*, and these drugs may be stored near one another. Both drugs are available in a 50 mg tablet strength only; and the “your” sound present in both *purine* and *uracil* adds a sound-alike component, further increasing the risk of an error. Another issue often associated with mix-ups, including the most



**Figure 2. PTU is easily misinterpreted.**

recent error, is use of the abbreviation *PTU* for propylthiouracil. Both drug names share the letters *P*, *T*, and *U*, so misinterpretation is easy. *PTU* is an error-prone abbreviation that has been on the ISMP's "Do Not Use" abbreviation list for many years.

The pregnant patient in the most recent case had a longstanding history of hyperthyroidism. Her private obstetrician had referred her to a maternal fetal medicine specialist, who wrote a prescription for *PTU* that was misdispensed on 2 occasions. The patient developed increasing fatigue, and after approximately 5 weeks, she developed a fever and

painful anal fissure. She also experienced vaginal bleeding. Her obstetrician suggested an immediate emergency department examination, in which she was diagnosed with sepsis and spontaneously aborted the fetus at 16 weeks' gestation. She was taken to the operating room (OR) to deliver the placenta, where she coded multiple times and died. The patient's death remained a mystery until her family gave prescription records from her community pharmacy to a pathologist, who was then able to determine that the patient's demise was related to *Purinethol* toxicity.

In the second incident, described in May on a New York City television news program, a woman also was mistakenly given *Purinethol* instead of *PTU* for her thyroid problem. She developed liver toxicity and was hospitalized for a week but survived.

Please share this information with staff who may prescribe, dispense, or administer these drugs. Electronic prescribing and barcode-assisted dispensing cannot entirely eliminate errors, but they offer some protection. Computer order-entry system warnings should be

installed for both drugs, with hard stops that require documentation before proceeding. Do not store *Purinethol* and propylthiouracil near each other, and consider the use of warning labels on product containers. Doctors should be encouraged to list brand and generic names on orders for *Purinethol*, as well as the purpose for prescribing either drug. Any prescription for *PTU* must require follow-up. When dispensing in community pharmacies, unless barcode scanning is used, match the drug's national drug code (NDC) number to the one listed in the computer.

## REFERENCES

1. Worley KB, Whitmore MB, Waddell JA, Solimando DA Jr. Eculizumab and temsirolimus. *Hosp Pharm.* 2007; 42(12):1111-1116.
2. *Torisel* [package insert]. Madison, NJ: Wyeth; May 2007. [www.wyeth.com/hcp/torisel/pi](http://www.wyeth.com/hcp/torisel/pi). Accessed June 12, 2008.
3. *Chemotherapy Final Dose Concentrations for Temsirolimus (Torisel)*. US Department of Veterans Affairs—Veterans Health Administration Pharmacy Benefits Management Service (PBM), Medical Advisory Panel (MAP), Center For Medication Safety PSCI (VA Medsafe); 2008. [www.ismp.org/sc?k=pbm](http://www.ismp.org/sc?k=pbm). Accessed June 12, 2008. ■