

# Look-Alike and Sound-Alike Drugs: Errors Just Waiting to Happen

**Authors:** Nancy Tuohy, RN, MSN, and Susan Paparella, RN, MSN, Huntingdon Valley, Pa

**Section Editor:** Susan Paparella, RN, MSN

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Nancy Tuohy, RN, MSN, is a Medication Safety Specialist for the Institute for Safe Medication Practices (ISMP\*), Huntingdon Valley, Pa, and is the Assistant Editor of the *ISMP Nurse Advise-ERR*.

Susan Paparella, *Bux-Mont Chapter*, is Director for Consulting Services, ISMP\*, Huntingdon Valley, Pa, and the Chair of ENA's ED Safety Workgroup.

For correspondence, write: Susan Paparella, RN, MSN, 1800 Byberry Rd, Suite 810, Huntingdon Valley, PA 19006; E-mail: [spaparella@ismp.org](mailto:spaparella@ismp.org).

J Emerg Nurs 2005;31:569-71.

0099-1764/\$30.00

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doi: 10.1016/j.jen.2005.07.012

**CE** Earn Up to 8 CE Hours. See page 607.

In 2004, an ED patient died after receiving a 10-mg dose of hydromorphone when 10 mg of *morphine* was ordered. As the ED nurse reached into the cabinet to select the narcotic, she recalled seeing “morph 10” on the box. She was temporarily distracted as she made the selection because another of her patients (an elderly gentleman) was attempting to climb off the end of a stretcher. She placed the 1 mL ampul in her pocket and proceeded to prevent the second patient from falling. She returned to the medication station to obtain a syringe and draw up the drug but did not stop at that time to complete the narcotic reconciliation record (thus eliminating the possibility of catching her mistake with a check of the remaining narcotic count). As a seasoned ED nurse, she never anticipated this possible drug package confusion. Concentrated hydromorphone, 10 mg/mL, typically was not stored in the emergency department. Only after the error was it discovered that an entire box of hydromorphone had been brought to the emergency department months earlier for an oncology patient. The extra drug had never been returned to the pharmacy. Given that these 2 drugs were in look-alike packaging from the same manufacturer, it was only a matter of time before a selection mistake like this would happen. Unfortunately, this error was complicated by the fact that this emergency department did not have specified monitoring guidelines in place for the care of patients after they received narcotics, and as such, the patient was discharged without reassessment. The pressure to free up beds to avoid ambulance diversion may have contributed to the decision to discharge the patient shortly after the drug was administered. On the way home, the patient experienced respiratory arrest in the family car and could not be resuscitated.

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\*ISMP is a nonprofit organization that works closely with health care practitioners, consumers, hospitals, regulatory agencies, and professional organizations to educate caregivers about preventing medication errors. ISMP is the premier international resource on safe medication practices in health care institutions. If you would like to report medication errors to help others, E-mail us at: [ismpinfo@ismp.org](mailto:ismpinfo@ismp.org) or call (800)FAIL-SAF(e). This Medication Error Reporting Program keeps information confidential and secure. We will include only the level of detail that the reporter wishes in our publications.

In a case like this, it is easy to be a Monday-morning quarterback and say “The nurse should have read the label more carefully,” yet we all have been the victim of a similar human slip called “confirmation bias” when we look at something (like a drug label or an order) but our brain sees what it thinks it should. (Have you ever gotten home from the grocery store with regular cola, when you swear you bought diet cola?) This human factors element, coupled with the look-alike packaging and distractions in the workplace, all helped to contribute to this fatal error.<sup>1</sup>

### How do errors happen?

Emergency departments are prime locations for mix-ups with look-alike and sound-alike drug names and packaging. Frequent verbal orders, automated dispensing cabinets, access to stock medications (often without pharmacy review), crowded storage spaces, and the need for rapid administration of medications all contribute to errors. When patients take numerous prescription medications and/or receive care from multiple health care providers, medication history information may be less reliable and more difficult to verify. Add to these factors the sheer number of look-alike and sound-alike drug names, available overlapping dosages and concentrations, and similar-looking packaging, and you have a recipe for disaster (Figure 1).

Opioids, lipid-based products, and newer insulin mixtures are among the drug classes in which medication names are commonly confused. Such products include specific look-alike and sound-alike drug name pairs (eg, ephedrine–epinephrine, morphine–hydromorphone, Zantac–Zyrtec, and Celebrex–Celexa). Mix-ups involving any drug are problematic but are even the more frightening when the confusion involves high-alert medications, as was illustrated in the opening error example.

Sound-alike names for insulin (also a high-alert drug) can create serious problems. Prior to admission, one patient told a physician he was taking Novolog Mix 70/30, which the physician ordered. The patient, however, received Novolin 70/30 for 2 days before a nurse discovered the error. Ironically, the hospital did not have Novolog Mix 70/30 on the formulary and Novolin was entered into the profile in error, possibly due to sound-alike confirmation bias and the look-alike dose concentration of “70/30.” Trying to correct the situation, the pharmacist called the physician and suggested the use of



FIGURE 1

Seven different drugs (morphine, hydromorphone, heparin, codeine, meperidine, phenobarbital, and dolasetron) that can be confused easily when the packaging looks similar.

Humalog Mix 75/25, which was on the formulary. The physician, however, insisted that the regimen remain the same as at home. The pharmacist then asked the patient’s family to bring in the patient’s insulin. Upon inspection, the insulin from home was actually Novolin 70/30, which the patient had been getting all along!<sup>2</sup>

### What is being done to prevent these errors?

The Institute for Safe Medication Practices (ISMP) has created its “List of Confused Drug Names” (<http://www.ismp.org/tools/confuseddrugnames.pdf>) to help raise awareness about the multitude of drug names that have been mixed up with one another. ISMP works continuously with drug manufacturers to improve the safety of drug naming and packaging procedures.

Additionally, using a modified Delphi Process, the ISMP assisted the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in creating its lists of look-alike and sound-alike drugs by rating the severity of the consequences of a mix-up and the likelihood of confusion in the clinical setting. This listing may be reviewed at the following Web site: <http://www.jcaho.org/accredited+organizations/patient+safety/05+npsglasa.pdf>. As of January 2005, as part of the JCAHO’s National Patient Safety Goals, organizations have been asked to “identify

and, at a minimum, annually review a list of look-alike/sound-alike drugs used in the organization, and take action to prevent errors involving the interchange of these drugs.” Participating organizations’ lists of look-alike drug name pairs should contain a minimum of 10 name pairs.<sup>3</sup>

### What can you do?

While awareness of look-alike and sound-alike products is a basic step in improving medication safety in the emergency department, *reliance on human memory is not effective*. It is necessary to employ system-based strategies rather than depending on individuals alone to prevent these errors. Use the following strategies to reduce your risk of error with look-alike and sound-alike medications.

**Verbal orders.** Because of the nature of the ED work flow, it may not be possible to totally eliminate the use of verbal/telephone orders. However, when verbal orders must be used, it is important to “read back” the order, spelling the name aloud. State the understood purpose of the medication, the brand, and the generic name of the drug.

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**Storage.** Do not store look-alike medications side-by-side or alphabetically. Remove problematic, infrequently used, look-alike medications like U-500 insulin or concentrated forms of narcotics. If you catch yourself selecting the wrong look-alike drug, discuss changing the location of that drug with your manager and pharmacy. Be sure to post a sign that lets others know when something has been moved and that guides them to the new location.

**Reminders and alerts.** Find out about placing alerts for look-alike and sound-alike products on automatic dispensing cabinet screens or on electronic medication administration records (eg, “this is epinephrine [Adrenaline]” or “this is Novolog [rapid-acting insulin]”).

**Differentiate.** Ask the pharmacy to apply “name alert” labels to look-alike products. Use tactile clues for certain products (eg, regular insulin) that could be confused with other products. Use bright colored highlighters to draw out names. Use “tall man” lettering (eg, hydrOXYzine,

hydrALAzine) to call attention to the different letters in look-alike names.

**Redundancies.** Use independent double checks with a second practitioner to avoid confirmation bias (where we “see” what we are expecting to find). The use of bedside bar-code scanning is another form of an effective double check.

**Patients.** Upon discharge, provide patients with written information about their drugs, including the brand and generic names. Let patients know the name of the drug you are administering and show them the packaging at the bedside before administration. Further investigate all patients’ questions prior to drug administration. Teach patients about drug names similar to those they are taking to alert them to the possibility of a mix-up, even when they pick up their prescriptions at a community pharmacy.<sup>2</sup>

**Report.** If you find drug names or packages with the potential for error, report them. Chances are, if you catch yourself choosing the wrong medication, someone else will do the same thing, only they may not catch it. By reporting the situation, you could prevent the same error from reaching a patient. Do not limit your reporting to just your institution, however. Inform your colleagues across the United States by reporting all errors to ISMP (USP-ISMP Medication Error Reporting Program) at [www.ismp.org](http://www.ismp.org). ISMP can then use the information to effect change.<sup>2</sup>

### REFERENCES

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