



Sound-alike
Look-alike
Drugs (SALADs)
and
Warning Labels

Danielle Ahlstrom, Pharm.D.
Kimberly Belongie, Pharm.D.

Objectives

1. Identify potential medication errors that can occur and consequences that may result
2. Identify strategies to help prevent medication errors involving sound-alike, look-alike drugs (SALADs)
3. Use Institute for Safe Medication Practices (ISMP) lists to determine which medications require special safeguards to reduce the risk of errors
4. Where to go to find more information on SALADs

Introduction¹

- In 2005 The Joint Commission National Patient Safety Goals included:
 - Require organizations to identify and, at a minimum, annually review a list of SALADs
 - Proactively implement safety strategies to help prevent medication errors involving these drug combinations
 - Proactive assessment of potential for medication errors should include:
 - Evaluation of potential look-alike packaging problems in addition to the drug names

Statistics²

- More than 3,170 pairs of U.S.-approved generic and brand drug names look or sound alike
- United States Pharmacopeia (USP) medication-error reporting programs (2003–06)
 - Patients might have been harmed by 1.4% of mistakes attributed to SALADs
 - 7 mistakes might have contributed to or resulted in death
- Med-error reporting programs involve the **voluntary reporting** of mistakes
- Of 25,000-some mix-ups that actually occurred
 - 64.4% originated in the **dispensing phase** of the medication-use process

Statistics²

- All drugs pass through a pharmacy
 - Pharmacy personnel "have the greatest number of opportunities for error" with medication SALADs
- Category of staff most often mentioned in errors involving SALADs:
 - Pharmacy technicians
 - Committing the initial error in 38.5% of cases
- Why pharmacy technicians?
 - May simply reflect place in the medication-use process
 - Work at a phase in the process where any errors made are more likely to be reported

Example (Look-Alike)³

- Patient A was diagnosed with epilepsy, resulting in seizures, which were controlled by lamotrigine (Lamictal)
- Patient A's epilepsy medication was accidentally filled with terbinafine (Lamisil)
- **Lamictal** vs. **Lamisil**
 - Indications: seizures vs. fungal infection

Errors Can Occur for a Variety of Reasons

- Pharmacist can't read the prescriber's handwriting
- Provider clicks on the wrong medication when entering a computerized prescription
- Health-care worker grabs a medication that looks similar to the prescribed medication
 - i.e. nurse, technician, pharmacist, provider

Examples



Discussion

What are some examples you can think of where SALADs resulted in a mistake?

SALADs⁴

Buspirone	Bupropion
Clonidine	Klonopin
Celebrex	Celexa
Inderal	Adderall
Lasix	Lantus
Lanoxin	Naloxone
Trazodone	Tramadol

Example (Sound-Alike)⁵

- Patient B received parenteral morphine, which resulted in respiratory depression
- The patient's provider called in an order for naloxone
- Despite this, the patient did not improve and a second dose of naloxone was ordered
- The nurse asked how much Lanoxin should be given
- **Naloxone** vs. **Lanoxin** (digoxin)
 - Indications: opioid overdose vs. arrhythmias
- The patient unfortunately died



Insulin Products

- Novolin (human insulin products)
- Novolog (human insulin aspart)
- Novolin 70/30 (70% isophane insulin NPH and 30% insulin regular)

Potential Errors and Consequences

- Similar:
 - Names
 - Strengths
 - Concentration ratios
- Mix-ups may result in hypoglycemia or poor diabetes control

Misreading Letter and Numbers⁴



- Research has shown that more than 50% of letter-number errors come from just 4 basic mix-ups:
 - the letter "L" and the number "1"
 - the letter "O" and the number "0"
 - the letter "Z" and the number "2"
 - the numbers "1" and "7"
- Mix-ups are most likely to occur when:
 - The information contains both letters and numbers, as in most medication orders

Discussion

What are some strategies your pharmacy utilizes to prevent mistakes due to SALADs?

Strategies to Help Prevent⁴

- Use **block printing** rather than *cursive writing* on handwritten orders
- Use European-style differentiation to clearly distinguish between confusing symbols
 - Write "Ø" to distinguish it from letter "O"
 - Write "7" to distinguish it from number "1"
 - Write the letter "Z" to distinguish it from number "2"

Strategies to Help Prevent^{6,7}

- Use automation when feasible
- Use TALL MAN lettering to distinguish between drugs with similar names
- Inform a pharmacist if SALAD medications are not separated on shelves or in automated drug dispensing machines

ISMP

Table 1. FDA-Approved List of Generic Drug Names with Tall Man Letters⁴

Drug Name with Tall Man Letters	Confused with
buPROPion	busPIRone
chlorproMAZINE	chlorproPAMIDE
cycloSERINE	cycloSPORINE
DUANOrubicin	DOXOrubicin
DOBUtamine	DOPamine
gliPIzIDE	glyBURIDE
hydrALAZINE	hydrOXYzine
medroxyPROGESTERone	methylPREDNISolone
prednisoLONE	predniSONE
TOLAZamide	TOLBUTamide
vinBLAStine	vinCRIStine

Strategies to Prevent Look-Alike Mix-ups⁴

- Use both brand and generic names
- Include purpose of the medication on prescriptions
- Configure computer selection screens to prevent look-alike names from appearing consecutively
- Changing the appearance of look-alike product names

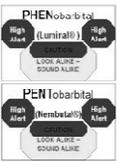
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Strategies to Help Prevent^{4,6-7}

- Allow adequate **space** between the drug name and the dose
 - In handwritten orders and electronic formats
 - In medication labels and shelf labels
- When reading an order
 - Does dose make sense?
 - Unsure which drug ordered?
 - Clarify with the prescriber

Strategies to Help Prevent⁷

- Pharmacy system changes and strategies to utilize to minimize drug name mix-ups:
 - Use of **auxiliary warning labels** or computer alerts
 - Separating products on shelves
- Familiarizing yourself with potential problem drugs



Summary⁷

- Confusion between similar drug names is an important cause of medication errors
- As many as 37% of medication errors might involve SALADs
 - Poor handwriting
 - Similar product labeling
 - Unfamiliarity with drug names or new products

Summary

- Pharmacy staff can help reduce SALAD errors by:
 - Familiarizing yourself with potential problem drugs
 - Changing the pharmacy system
 - Separating SALADs on shelving
 - Warning labels
 - Automation



The Joint Commission

Official "Do Not Use" List¹

Do Not Use	Potential Problem	Use Instead
U (unit)	Mistaken for "0" (zero), the number 4 (four) or "cc"	Write "unit"
IU (International Unit)	Mistaken for IV (intravenous) or the number 10 (ten)	Write "International Unit"
Q.D., QD, q.d., qd (daily)	Mistaken for each other	Write "daily"
Q.O.U., QOU, q.o.d., qod (every other day)	Period after the Q mistaken for "I" and the "O" mistaken for "I"	Write "every other day"
Trailing zero (X.0 mg) ²	Decimal point is missed	Write X mg
Lack of leading zero (.X mg)		Write 0.X mg
MS	Can mean morphine sulfate or magnesium sulfate	Write "morphine sulfate"
MSO ₄ and MgSO ₄	Confused for one another	Write "magnesium sulfate"

¹ Applies to all orders and all medication-related documentation that is handwritten including free-text computer entry or on pre-printed forms.

² Exception: A "trailing zero" may be used only where required to demonstrate the level of precision of the value being reported, such as for laboratory results, imaging studies that report size of lesions, or catheter/lumen size. It may not be used in medication orders or other medication-related documentation.

http://www.jointcommission.org/assets/1/18/dnu_list.pdf

For More Information⁴

- One source of SALAD medications is The Institute for Safe Medication Practices (ISMP)
 - ISMP's List of Confused Drug Names



References

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