Irish Medication Safety Network

Briefing Document on Sound-Alike Look-Alike Drugs (SALADs) in the Hospital Setting

This document is intended to be used in conjunction with the IMSN ***SALAD Bar: a list of reported Sound-Alike Look-Alike Drugs which have been confused or have potential for confusion*** (available on www.imsn.ie)

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On behalf of the Irish Medication Safety Network
In consultation with Irish Medication Safety Network members

About the IMSN

The Irish Medication Safety Network (IMSN) is a voluntary, independent group, comprising hospital pharmacy based specialists actively involved in medication safety and Medication Safety Facilitators/Coordinators which aims to promote patient safety and safe medication practices through collaboration and shared learning within the network and with the wider community.

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Irish Medication Safety Network

Definition

SALADs (Sound-Alike Look-Alike Drugs)
Look-alike and sound-alike drug names and look-alike product packaging which can cause confusion resulting in potentially harmful medication errors.[1]

Background

According to the UK Medicines and Healthcare Products Regulatory Agency (MHRA) there have been recent cases - including some with fatal outcomes - in which patients have received the wrong medicine due to confusion between similarly named or sounding brand and generic names.[2] Confusion between SALADs is one of the most common causes of medication error as per the World Health Organisation's Collaborating Centre for Patient Safety Solutions.[3, 4] In the Irish setting, a number of SALAD drug-name pairs were involved in errors/near misses reported in a 2014 survey of hospitals.[5]

Table 1: Selection of drugs which have been involved in SALAD mix-ups.

Additrace®	Addiphos®	Janumet®	Januvia®
alfentanil 500mcg/ml	alfentanil 5mg/ml	Janumet®	Sinemet®
Alkeran®	Leukeran®	Lamictal®	Lamisil®
amiloride	amlodipine	lamivudine	lamotrigine
amiodarone	amlodipine	Levemir®	Lantus®
amitriptyline	aminophylline	levobupivacaine	bupivacaine
Anexate®	Anectine®	Lexapro®	Lexotan®
aripiprazole	rabeprazole	Losec®	Lasix®
Arthrimel®	Arythmol®	Migalastat®	miglustat
azathioprine	azithromycin	morphine	hydromorphone
bumetanide	budesonide	nifedipine	nimodipine
carbamazepine	oxcarbazepine	NovoMix®	NovoRapid®
carbocisteine	carbamazepine	Ocuvite®	Orovite®
ceftriaxone	cefotaxime	ondansetron	olmesartan
cephalosporins		Optilube®	Atropine mini-jet
ciclosporin	Cyklokapron®	Oramorph®	Oxynorm®
clindamycin	clarithromycin	Palexia® SR tab	Palexia® film coated tab
clomipramine	chlorpromazine	Pradaxa®	Palexia®
clobazam	clonazepam	rifampicin	rifaximin
clotrimazole	cotrimoxazole	rifampicin-containing products	
Cyclogest®	Cytotec®	Slow K®	Slow Sodium®
dactinomycin	daptomycin	Synacthen® / Syntocinon®	Syntometrine®
dipyridamole	disopyramide	SSRIs / SNRIs	
dopamine	dobutamine	Solpadeine®	Solpadol®
edoxaban	enoxaparin	Solu-Medrone®	Depo-Medrone®
Humalog Mix 25®	Humulin I/S/M3®	valaciclovir	valganciclovir
hydroxyzine	hydralazine	vinblastine	vincristine
ISMN	Istin®	Xalacom®	Xalatan®

Factors contributing to SALAD errors

it deosn't mttaer in waht oredr the ltteers in a wrod are the olny iprmoatnt tihng is taht the frist and lsat ltteer are in the rghit pcale

Surprisingly, many people can read the above sentence. The order of the letters in the word do not matter, the only important thing is that the first and last letters are in the right place.[6] This partly explains why SALAD errors are a significant medication safety issue. Other factors are discussed below.

Drug names - quantity and complexity

- **Quantity of drug names:**[3] Over 10,000 human medicines are currently authorised by the Health Products Regulatory Authority (HPRA) for use in Ireland.[7] This is before considering exempt medicinal products, nutritional and borderline products, and complementary and alternative medicines.
- **Generic and proprietary names:**[3] Drugs are discussed and documented in terms of both a generic and brand name, giving healthcare professionals and patients a multitude of drug names to deal with. There is also an increasing number of 'branded generics' on the Irish market. For example simvastatin can currently be prescribed using at least seven different names, and venlafaxine by at least ten. [8]
- **Spelling errors:** A spelling error involving even just one or two incorrect or misplaced letters can quickly transform the intended drug into a a completely different one. For example, clotrimazole and cotrimoxazole (only a couple of letters in the difference).
- **Combination products:** Combination products contain multiple active ingredients. Often the combination product comes in a range of strengths. Examples include:
    - Fosavance® 70/2800 and Fosavance® 70/5600
    - Co-Diovan® 160mg/12.5mg, Co-Diovan® 160mg/25mg, Co-Diovan® 320mg/12.5mg, Co-Diovan® 320mg/25mg
    - Acerycal® 5/5, Acerycal® 5/10, Acerycal® 10/5, Acerycal® 10/10. [9]
- **Different formulations of the same active drug:** One example is the way in which sustained release preparations can be differentiated from immediate release by use of an additional word like "Retard", or by extra letters like XL, XR, SR, PR etc. Lack of standardisation of these acronyms can lead to confusion and error.[10]
- **Different strengths of the same drug:** Packaging may be similar across a particular brand.

Handwriting[3]

Illegible writing is an important contributory factor to errors in medical care. This is a problem inherent in average human writing, and not exclusive to prescribers.[11] The Irish healthcare system remains to a large extent reliant on a system of handwritten communication and is yet to fully adopt the use of technology. [12, 13]

Electronic systems

Moving away from handwritten prescriptions to electronic prescribing systems enhances patient safety and reduces medication error rates. However e-prescribing does not eliminate the possibility of a SALAD error. Selection errors can occur if picking from a drug list (drop-down menu), or if a typographical eror occurs while filling free-text fields in an electronic prescription.[14] For further evidence that Electronic does not automatically equal Risk Free, consider how use of computers in dispensaries has been the norm for many years. Despite this, SALAD dispensing errors have not been eliminated.[15]

Packaging (look-alike) [3]

Look-alike packaging is also recognised as a serious problem.[1, 4] Different drugs or different strengths of the same drug can easily be mistaken for each other when they have similar packaging. The examples shown in Figure 1 highlight the visual similarities between packaging of some medicines (and two non-medicines!). Even when a "Purchasing for Safety" policy has been implemented, changes to packaging and product livery can occur after the initial assessment. Parallel imports can also mean that the same product can have different packaging. Some companies adopt a standardised approach to livery, which in itself can lead to visual similarities between products.

Product shortages[16]

The European market is vulnerable to drug shortages. These can be sudden, unexpected, and require urgent action. A different brand or presentation of the same drug, or an alternative but therapeutically equivalent drug, may be required. Checks for SALAD error potential may not be completed during this accelerated procurement process.

Strategies for risk reduction at hospital level

- Adopt electronic systems for prescribing and documentation of administration where possible. Drug databases should be configured with safety as a primary consideration.
    - Ensure governance and quality assurance systems for electronic drug databases include reference to potential for SALAD errors, and strategies on how to reduce the risk.
    - Evidence-based/ judicious use of pop-ups and alerts should be considered, to maximise effectiveness and minimise alert fatigue.
    - Database design should facilitate inclusion of indication[20,26] which adds clarity to a prescription.
- In conjunction with an optimally implemented electronic health record, bar code medication administration systems have the potential to reduce administration errors[24] ("closed loop medication administration").
- Ensure that the concept of SALAD pair mix-ups is addressed during staff orientation, at educational talks and in Continuing Professional Development programs.
- Implement a 'Purchasing for Safety Policy'. When ordering a new medicine, consider potential for SALAD mix-ups. Limitations: Purchasing for Safety is not guaranteed to prevent a SALAD from entering your hospital. Manufacturers can change their product livery, parallel imports can have different packaging, and shortages can lead to urgent procurement of a much-needed alternative.
- Have a system where staff can highlight serious or potentially serious SALAD mix-ups - for example through medication safety incident and near miss reporting. These should be reported to the Health Products Regulatory Authority (HPRA).
- Review at intervals (e.g. through audit, review of incident and near miss reporting, use of published lists) for potential new SALAD pairs, and communicate this to frontline staff.
- Foster an environment which allows medication use processes (especially prescribing, dispensing and administration) to occur with minimal interruption. Time and space should be dedicated to these high risk tasks.
- Review design of Prescription Forms – Increase paper size to at least A4 to allow adequate space for completion. Create space for the prescriber to include all the relevant information, including the indication[20,26] for the drug where appropriate. Consider strategies to encourage unjoined writing e.g. lightly lined forms:[17]

A	s	p	i	r	i	n

- There may be a role for careful introduction of Tall Man lettering, but to maximise effectiveness this needs to first be standardised - ideally at a national or international level.[18, 19] Tall Man lettering is a method of applying uppercase lettering to sections of look alike, sound alike drug names to bring attention to the points of dissimilarity.[18]
- In areas where verbal orders are authorised, a verbal order policy should be in place.[23] Verbal orders should be minimised.
- Analyse local incident and near miss data to identify SALADs in the hospital, which can be used in addition to external data.

Actions that can be taken at various stages of the medication use process

Step	Recommendations
Communication	• Involve the patient • Take care at transitions of care which are vulnerable to communication errors, including medication reconciliation on admission and discharge. • Include the indication to add clarity and certainty[20,26]

Prescribing	• Include indication to add clarity and certainty[20,27]- use up to date reference sources
	• Never abbreviate the name of a drug under any circumstances[21]
	• Handwritten prescriptions: Write legibly, in unjoined mixed case/ letters.[17,22]
	• Electronic prescriptions: Take care to pick the correct entry when selecting drugs from a database/ dropdown menu - do not assume that electronic automatically means "safer". Consider the proximity of SALAD medicines on dropdown menus.
	• Provide all of the required information on the prescription - avoid "as directed"
	• Verbal prescribing orders should be minimized. If unavoidable[23],
	  ○ Write down the message being given - scribe should ideally be a second person
	  ○ Read back to ensure message is correct, including saying numbers out individually (e.g. one zero etc)
	  ○ Include indication to add clarity and certainty

Dispensing	• Do not rely on packaging colour/ design (the livery) - users must read the **name, strength, and formulation** every time. • Users of electronic databases should consider the proximity of SALAD medicines on drug data files: risk of mis-selection. • Where possible, dispense medication in original manufacturer's pack. • When packing down, position label[25] to ensure the entire drug name displays clearly on a single side of the product. Avoid situations where the user has to turn the carton to read the full name.
Storage	• Optimise drug storage systems with due consideration for potential SALAD errors. • Ensure that the outward-facing surface of the product has the full name, strength, and formulation clearly visible • Ensure adequate lighting in areas where medications are selected e.g. from drug trolleys/shelves.[27]
Administration	• Do not rely on packaging colour/ design (the livery) – users must read **the name, strength, and formulation** every time. • Understand the indication[20,26] as this can add clarity and certainty - use up to date reference sources. • Users of electronic databases should consider the proximity of SALAD medicines on drug data files: risk of mis-selection. This includes for example e-prescribing packages and smart IV infusion pumps. • Include the patient - the last step in the administration process

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