

Principles for the Application of TALLman Lettering in Canada

TALLman lettering is a method of applying uppercase lettering to sections of look-alike/sound-alike (LASA) drug names to bring attention to their points of dissimilarity.¹ By accentuating the points of difference, the application of TALLman lettering to a drug name may assist in alerting healthcare providers that the drug name in question may be confused with another drug name.² TALLman lettering may also assist with name recognition and comprehension by affecting the reader's eye movements.³ Its use does not rely on characteristics of type such as font or size. It can be used in any electronic system that accommodates uppercase and lowercase text options.

Several studies have provided evidence that highlighting sections of drug names with TALLman lettering may help to distinguish similar names,^{2,3,4,5} however the evidence for its effectiveness in reducing drug name confusion errors remains mixed. Further research is needed to study the effectiveness of TALLman lettering application in practice environments. Determining the drug name pairs that would benefit from the technique and the optimal capitalization is complex. However, the implementation of TALLman lettering into practice is a simple and straightforward approach to distinguishing words that look similar. As a result, it has become an accepted differentiation strategy for LASA drug names in healthcare settings.^{6,7,8}

In the United States, the Institute for Safe Medication Practices (ISMP) and the Food and Drug Administration (FDA) have done leading work on the topic of TALLman lettering.⁹ Other members of the international safety community have also embraced this approach.^{10,11,12,13} In 2010, the Institute for Safe Medication Practices Canada (ISMP Canada) and the Canadian Association of Provincial Cancer Agencies (CAPCA) published a list of TALLman lettering recommendations to help distinguish the names of select oncology drugs.¹⁴ Work by ISMP and ISMP Canada subsequent to a fatal incident has also resulted in the recommendation that TALLman lettering be applied to the drug name HYDROmorphine to help prevent mix-ups with morphine¹⁵. Knowledge translation work by ISMP Canada and partners has resulted in the uptake of this recommendation across Canada.

To provide consistency locally, nationally, and potentially internationally, the approach to TALLman lettering should ideally be standardized. Global consistency could minimize confusion and facilitate implementation among stakeholders, such as pharmaceutical companies, for labelling and packaging at the manufacturing level.¹² The International Medication Safety Network (IMSN)¹⁶ is leading collaborative work to acknowledge and build upon international efforts in this area. More specifically, the IMSN has proposed the use of TALLman lettering to improve differentiation among error-prone International Nonproprietary Names (INNs) of drugs.¹²

ISMP Canada has developed the list of "TALLman Lettering for Look-Alike/Sound-Alike Drug Names in Canada" (presented below). Development of this list was guided by the following principles

Consistency in Application of TALLman lettering

- TALLman lettering will have the greatest impact on the differentiation of LASA drug names if it is applied consistently. The list of "TALLman Lettering for Look-Alike/Sound-Alike Drug Names in Canada" was developed to provide consistency across the Canadian healthcare continuum (i.e., from manufacturers to end-users). Similar to international work in this area, the focus has been on confusable nonproprietary (generic) drug names, in particular prescription pharmaceuticals and

biologics.

- TALLman lettering lists for confusable drug names have already been published in some other countries, e.g., the FDA and ISMP Lists of Look-alike Drug Names With Recommended Tall Man Letters (United States),⁹ the National Tall Man Lettering List (Australia),¹⁰ and the Tall Man Lettering List (New Zealand).¹¹ These lists were used as reference material for consideration in the local (Canadian) context.

Use of TALLman Lettering as a Differentiation Strategy

- TALLman lettering is one of several risk-mitigation strategies that can be used to differentiate LASA drug name pairs.^{17,18,19}
- TALLman lettering is used in the context of a specific confusable *pair* or *group* of drug names.
- The use of TALLman lettering should be limited to drug name pairs associated with high risk to patient safety²⁰.
- TALLman lettering may be effective because it draws attention to drug names presented in this format⁴, and can act as a warning. Overuse of the technique may reduce its effectiveness¹⁹, as names may no longer appear novel.
- The root causes for drug name confusion should be understood before TALLman lettering is considered as a potential solution. If the confusion arises from look-alike labelling or packaging or from knowledge deficits about drug names and their indications, alternative differentiation strategies should be applied.
- Systematic risk assessment processes should be used to determine which drug name pairs would most benefit from TALLman lettering.^{10,11,13} Risk criteria may include orthographic similarity (e.g., BI-SIM or EDIT distance scores²¹); similarity of dosing, route of administration, dosage form, indication, or environment of use (e.g., intensive care unit); and frequency of use. Reported incidents involving harm or the potential for severe or catastrophic harm if the drugs are confused should also be considered.
- TALLman lettering as a differentiation strategy has not been applied in the following situations, where alternative risk-mitigation strategies may be considered:
 - combination products (e.g., bupivacaine vs. bupivacaine with epinephrine)
 - different salts of the same drug (e.g., ferrous gluconate vs. ferrous fumarate)

Approaches to TALLman lettering

- In cases where drug name pairs have low orthographic similarity, the potential risk of harm and the clinical experience of practitioners should be considered before capitalization is applied. Orthographic factors that increase visual similarity include similar length of the names and number of groups of characters in the names.²²
- Healthcare practitioners should be involved in the process of identifying confusable drug name pairs relevant to their respective practice settings. They should also participate in reviewing proposed TALLman options and assessing risk-reduction strategies to be implemented in their practice settings.¹² The user's subjective perception of drug name similarity is an important consideration. The capitalized letters should make the drug names distinguishable from the user's

perspective.

- A recognized TALLman method (e.g., CD3 or Mid-TALLman^{2,23}) should be used to determine which letters of a drug name pair are to be capitalized. However, direct application of a single rule may not always lead to the best TALLman option, and alternative TALLman methods or options should also be considered.
- In some situations, direct application of a specific TALLman method may inadvertently make two names appear more similar to one another or more similar to a drug name outside the identified pair. In these instances, no capitalization or an alternative capitalization approach should be considered.
- For groups of three or more confusable drug names, attempts should be made to apply a capitalization scheme that maximizes distinctiveness across all possible pairings.
- Capitalization should not be applied to the following elements of drug names:
 - common prefixes or suffixes
 - the letter “i”, to avoid confusion with lowercase letter “l” (consistent with CD3 rule)⁵
 - letters or sections of drug names that are phonetically similar, with the number of syllables, pronunciation stresses, and placement of vowel and consonant sounds being attributes that should be considered when determining the degree of drug name similarity²⁵ (e.g., vinCRISTine – vinBLASTine does not capitalize the “vin” or “tine”; daBRAFeNib – daSATiNib does not capitalize the “da” or the “nib”.)
- Capitalization may not be helpful if it is applied to letters that affect the unique shape of a word. The shape of a printed word is important for word recognition and has been linked to proofreading errors.²⁴ It is affected by “ascenders” [letters with lines that extend upward, e.g., h or b], “descenders” [those with lines that extend downward, e.g., y or g], and “half-line” letters [e.g., e or r].²⁵

Implementation of TALLman lettering

- Providing education to end-users, such as healthcare practitioners, about the hazards associated with confusable drug name pairs and the purpose of TALLman lettering is a key implementation strategy. An awareness of the purpose of TALLman lettering can help users to distinguish between similar names when this approach has been applied.^{4,5}
- Periodic review of TALLman lists will allow the assessment of continued relevance of the selected drug name pairs in current practice. For example, new products with LASA names may become available, or existing products on the list may be discontinued.

Complementary or Alternative Strategies to Reduce Drug Name Confusion

- The following complementary or alternative strategies may help to reduce drug name confusion:
 - applying attributes such as bold, italic, colour, or colour backgrounds or enlarging the type size of capitalized letters to help distinguish dissimilar letters^{17,26}
 - evaluating the potential for name confusion when adding new products to the formulary¹⁸
 - providing information to end-users about LASA drug names to help maintain awareness of this issue¹⁸

- implementing bar coding or independent double checks (or both) for activities such as selection, dispensing, and administration of drugs^{14,18}
- reducing the potential for confusion between confusable name pairs by including both the brand and nonproprietary drug names on prescriptions or orders, medication administration records, automated dispensing cabinets, and computer databases and displays^{16, 18}
- configuring the screens of computers and automatic dispensing cabinets to prevent the consecutive appearance of potentially confusable drug names¹⁸
- including the dosage form, drug strength, complete directions, and indications for use on prescriptions or orders, to help differentiate LASA drug names¹⁸
- storing products with LASA drug names in different locations¹⁸
- exploring and implementing drug-specific risk-reduction strategies for confusable drug name pairs,¹⁸ such as stocking different strengths of drugs with confusable names (e.g., morphine at 1 mg/mL and HYDROmorphine at 2 mg/mL)

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