

2013

POSITION STATEMENT

Making Medicines Naming, Labeling and Packaging Safer



BACKGROUND

Much of the death and serious harm caused by mistakes and accidents in health care is preventable.¹
² Safe design of healthcare products and systems, a key strategy for reducing preventable harm, is underutilized.³

For example, medication errors frequently occur because of confusion from:

- ❖ sound-alike or look-alike medicine names
- ❖ similarities in packaging and labeling appearance
- ❖ unclear, ambiguous or incomplete medicine label information.

These can lead to errors in selecting and using medicines including wrong drug, dose, formulation, route and method of administration errors.⁴⁻⁹

All those involved in the medicine during its life cycle can contribute to patient safety including:

- ❖ medicines, devices and software companies
- ❖ regulators and policy makers
- ❖ healthcare professionals
- ❖ patients
- ❖ healthcare providers and purchasers.

In many countries the regulation of medicines naming, labeling and packaging is not providing adequate safeguards for patients. For example, there is little recognition of the importance of human factor principles in selection and design of drug names, labels and packages for minimizing error potential and enhancing medication safety.⁵⁻⁹

In addition, current approaches to labeling and packaging privilege commercial considerations, such as “trade dress” or “umbrella” brands, and focus inadequately on the context in which the medicine will be used. These approaches:

- ❖ are not patient-centered
- ❖ assume perfect performance by healthcare professionals and by patients to avoid inevitable errors⁸
- ❖ risk patient safety.

POSITION STATEMENT

The International Medication Safety Network recommends the following steps as part of a comprehensive, worldwide solution to the problem of unsafe medicines naming, labeling and packaging.

1. Regulations for medicines naming, labeling and packaging in all countries should be strengthened to:
 - a. require better design and field testing of medicines naming, labeling and packaging before release for use
 - b. incorporate human factors theory
 - c. promote safer use in practice.
2. The pharmaceutical industry should ensure that their products are safely named, labeled and packaged to minimize errors in selection and use.
3. Healthcare providers should assess medicines names, labels and packages, as well as associated devices and software, before purchasing decisions are made and products are introduced into use, so that risks may be identified, minimized or managed.

Recommended Specific Actions

- a. Guidance for safe design of medicines labels and packaging has been published by a number of organizations and should be developed, improved and used by the pharmaceutical industry, medicine regulators and healthcare providers when developing and risk assessing medicines naming, labeling and packaging. ⁸⁻¹⁹ (A summary of safe design guidance is included in the next section on page 4.)
- b. The proprietary (trade/brand) names of new medicines should be subject to human factors assessment and user testing by manufacturers; and non-proprietary (generic/active ingredient) by the WHO INN Programme. ¹³⁻¹⁶ Evidence that names have been tested and are considered acceptable for use should be an essential requirement prior to the medicine receiving marketing authorization and should be made publicly available as a proposed name safety assessment report.
- c. The design of new medicines labeling and packaging, including associated devices and software, should be subject to human factors assessment and user testing by manufacturers. ⁸⁻¹² Evidence that these designs have been tested and are considered acceptable for use should be an essential requirement before new medicines receive a marketing authorization. ¹⁷⁻¹⁹ The results of the human factor assessment and user testing should be made publicly available as a proposed packaging safety assessment report.
- d. Healthcare providers should review risk assessment data from industry and record their own risk assessment of new medicines naming, labeling and packaging before the products are purchased and introduced into use. This ensures that additional risk management safeguards can be implemented prospectively as required.

All medicines should have a machine readable (bar) code, e.g., a GS1 Global Trading Index Number (GTIN). For injectable medicines, this information should be placed on unit of use containers i.e. ampoules, vials and infusions. Bar codes should be used to reduce selection errors when dispensing and administering medicines.

International Medication Safety Network

The International Medication Safety Network (IMSN) is an international network of safe medication practice centers established with the aim of improving patient safety. This is achieved by operating medication error reporting programmes and producing guidance to minimize preventable harms from medicine use in practice. IMSN promotes safer medication practice to improve patient safety internationally.

For more information

www.intmedsafe.net/contents/AboutIMSN.aspx

SUMMARY OF DESIGN FOR SAFETY GUIDELINES

Guidance for safe design of medicine naming, labeling and packaging has been published by several organisations.⁸⁻¹⁹ A summary of key elements of this guidance is provided below.

A. LABELING

1- Essential information

Certain information is essential for using a medicine safely and should be presented clearly and prominently on the outer packaging label. Essential items are:

- ❖ proprietary name of medicine (also referred to as the trademark or brand)
- ❖ international non-proprietary (generic) names of active pharmaceutical substances
- ❖ dose strength/concentration
- ❖ route(s) of administration
- ❖ dosing instructions (for over-the-counter medicines)
- ❖ specific warnings
- ❖ standardization of pictograms/symbols to convey essential information.

This essential information should always be presented on the main package face(s) and should be grouped together on the same face, where practicable. These items should not be separated by additional information, logos or graphics.

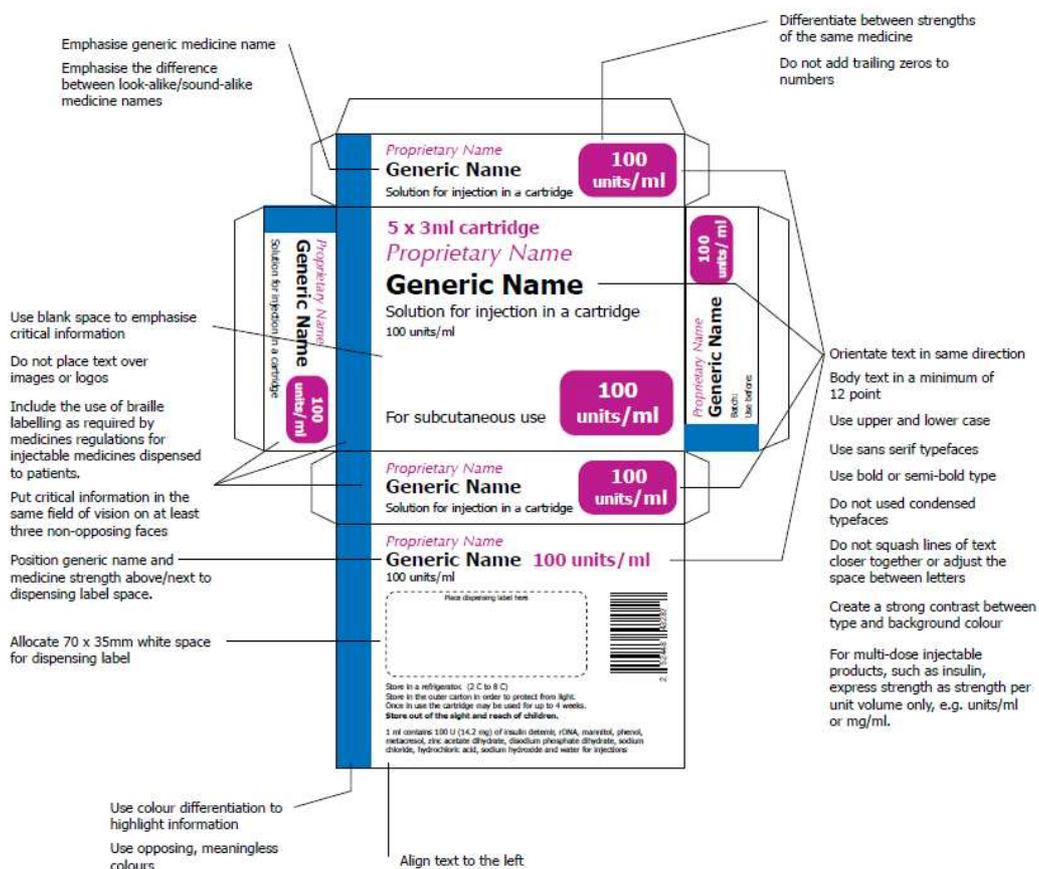


Figure above collates key recommendations from the Design for patient safety: A guide to the graphic design of medication packaging.¹⁰

Individual country regulatory agencies may have their own unique requirements and formats that must be considered prior to finalizing the presentation of essential information.

2- Other information required by regulation

Other mandatory information on the packaging should appear in a less prominent position or be printed elsewhere. For example, the marketing authorization number, batch number and expiry date should be positioned on the back or side panels of the package. Additional, less safety-relevant information, such as in the package leaflet should be presented less prominently to avoid obscuring essential information.

3- Language

Labeling information should appear only in the official language(s) of the country where the product is marketed. In case of multi-language packs, special attention should be paid to presenting labels in a clear and legible manner to avoid cluttering and to simplify locating and understanding essential information.

4- Space for a dispensing label

For packs designed to be used by patients, a clearly designated space should be provided on the outer packaging for a dispensing label (to include patient-specific information). Dimensions may vary but, at a minimum, a 70 x 35 mm space should be allowed.

5- Medicine name

The name of the medicine should include the non-proprietary (generic) and the proprietary name (where applicable). Dose strength and pharmaceutical form should also be included in all labeling and packaging components where the name is required to appear.¹⁶ The international non-proprietary name (INN) or, if none exists, the usual common name, should immediately follow the proprietary name on the front face of the packaging and be prominently and legibly displayed.

The full name of the medicine should appear prominently on at least three non-opposing faces of the outer packaging to allow clear identification of the medicine: the front face, one of the two side panels and one of the two end panels.

6- Pharmaceutical form

Pharmacopeia standard terms should be used for the pharmaceutical form. These should include standard expressions for long-acting dose forms.

7- Expression of strength

- ➡ The quantity of the active pharmaceutical substance should be expressed in one of the following ways:
 - ❖ per dose unit
 - ❖ per unit of volume, if appropriate for the dose form
 - ❖ per unit of weight, if appropriate for the dose form.
- ➡ Strength of single dose injectables and liquid preparations should be stated as the total quantity of the active pharmaceutical substance per total volume and per ml.¹⁴ If the volume in the container exceeds 1 ml, the concentration (quantity of active pharmaceutical substance per one ml) should be indicated immediately below the strength, either in brackets or in less prominent letters.

- ➔ For large volume and multi-dose parenterals, the quantity of active pharmaceutical substances should be stated per ml, per 100 ml etc. as appropriate.
- ➔ The dose strength of solutions and suspensions for oral administration should preferably be expressed as a concentration i.e. mg/ml.
- ➔ To minimize risk of confusion, indicating strength in percentages should generally be avoided, particularly where dosing is calculated by medicine weight or volume. An exception may be justified in certain cases where the name of the medicine includes the indication of strength as a percentage e.g. in medicines for cutaneous use or eye drops.
- ➔ The dose strength for a medicine should be expressed in an appropriate metric system unit, except in situations where other units of measure are accepted and required, e.g. units of potency for biological medicinal products.
- ➔ Different strengths of the same medicine should be stated in the same way, for example tablets 250 mg and 500 mg (mg should be used from 1 mg to 900 mg).
- ➔ The simultaneous use of milligrams and international units for the same medicine should be avoided.
- ➔ The use of decimal points should be avoided where they can be easily removed e.g. 250 mg is acceptable whereas 0.25 g is not.
- ➔ The expression “microgram” should always be spelled out in full rather than abbreviated in order to minimize the possibility of confusion with “milligram”.
- ➔ Trailing zeros should not appear e.g. 2.5 mg and NOT 2.50 mg; 1 mg not 1.0 mg. When necessary, the decimal point does not need to be centered, provided that the full stop used is clearly visible.
- ➔ Labeling with slash marks may lead readers to mimic in their own handwriting and should be avoided where space permits. Instances have occurred where the slash has been misread as the number 1, which may cause a dosing error.

8- Route of administration

Positive messages should be used to describe route of administration, such as “give by...”. Avoid use of negative statements (e.g., “not for intrathecal use”) because they may easily be misread and mistaken in a manner exactly opposite of what is intended – see number 10 below, vinca alkaloids). Only a nationally recognized list of standard terms for the route of administration should be used. Non-standard routes of administration should be spelled out in full to avoid confusion.

Some routes of administration will be unfamiliar to patients and may need careful explanation. This is particularly important for medicines which are available for self-medication. However, additional information on the route of administration in standard terms may be given on a dispensing label.

9- Dosing instructions

General dosing instructions are required on the outer package of medicines for self-medication.

Medicines that are supplied on prescription should have individual dose instructions added in the form of a dispensing label at the time of dispensing. General dose instructions and other essential information about the medicine are supplied with the package leaflet.

10- Special warnings

The marketing authorization of certain medicines may require that specific warnings, essential for safe use, are provided on the front face of the package. Examples of warnings which should be considered before use, follow:

Vinca alkaloids	<i>To be given intravenously only - fatal if given by other routes</i>
Oral methotrexate	<i>Usually taken once a week</i>
Potassium chloride concentrate injection	<i>Dilute before use</i>
All penicillin products	<i>Contains penicillin</i>

Positive statements on medicines labeling are preferred in order to avoid ambiguous messages. Negative statements should be avoided.

11- Format and design

- The information on the label must be clearly visible and presented in legible characters that are easily understood by all those involved in supplying and using the medicine.
- Essential information should appear in the order described in Section A (1) of this document. It should be in a font size that maximizes legibility, at least on the front face of the packaging.
- Essential information should not be mixed with non-essential information. The minimum letter size recommended for use on the outer packaging is 12 point Arial, although 14 point would be more acceptable for people with visual impairment.
- Although the use of a large type may be appropriate, other factors are equally important in making the information legible.
- The fonts should be clear and legible, in a colour or colours contrasting strongly with the background. Clear and legible sans serif fonts, such as Arial, Helvetica or Univers, in bold or semi-bold should be used. Wholly capitalised words and sentences have poor legibility and should not be avoided.
- Attention should be given to letter and line spacing which improves legibility. Text should not be condensed as it may reduce legibility. At the same time, some areas should be left blank in order to highlight information essential for safe identification and administration, e.g. the medicine's name and strength.
- Text should be presented with the same orientation on every face of the outer packaging excluding the ends. This will assist reading information on adjacent panels and without having to turn the pack.

12- Use of colour

- The use of colour may help to differentiate between medicines with similar names by highlighting unique sections.
- Effective use of colour and other elements such as colour bands, boxed text and reversed out printing in the design of the packaging, should be used to ensure correct identification of the medicine. Particular packaging design features which distinguish from other packaging should be considered. The use of colour should be considered to draw attention to product differences (eg, strength or other important property). It must not be a fixed part of the company trade dress that permeates in the same manner from product to product.
- Different strengths and presentations of the same medicine or different medicines from the same manufacturer should always be clearly distinctive.
- Colour is recommended to differentiate between concentrations or dose strengths of the same medicine and to draw attention to specific information on the label or to enhance recognition. Effective use of symbols and shapes has been utilized to allow a manufacturer's packages to look different.

13- Machine readable codes

Information contained within the machine readable (bar) code should include the batch number and expiry date as well as GTIN. It should be located in a place that will not be covered by pharmacist dispensing labels and can be scanned after the pharmacist has affixed the dispensing label.

B. PACKAGING

1- Unit dose packaging

Medicines whose doses are standardized should be provided in unit dose presentations, ready for use and administration. ²⁰ Medicines regulations should be updated to require complete and unambiguous labeling of every single unit of all licensed medicines (e.g. tablet, ampoule, vial, nebulas), including the INN, trade name, strength, dose, expiry date and batch number and a data matrix bar code. ^{8,9} Labeling a unit dose bubble pack with a single label and/or bar code is not sufficient. Each dose must be individually labeled.

A safety film should be used on blister packs that contain medicines with a risk of fatal poisoning.

2- Bulk packaging

Bulk bottles for tablets and capsules should be banned from direct delivery to patients, beginning with substances that are fatal to children (e.g. iron, methotrexate, quinine) and orodispersible medicines.

A child-proof cap on bottles of oral liquid medicines should be required for medicines.

3- Dosing devices

The dosing device of a liquid dosage form (oral or injectable) is a key determinant of the quality and particularly the accuracy of the doses prepared. The metric system should be utilized.

Multi-dose oral liquid forms should always be supplied with a dosing device utilizing a metric scale, and measuring medicines with household spoons is discouraged. Effective solutions should be provided

to ensure that patients can identify the correct dosing device for their medicine (e.g. label the device or fit bottles with plastic holders into which users can insert the dosing device).

C. NAMING

A poorly designed medicine name can cause communication and selection errors in practice that in some cases may be fatal or lead to severe harm. ¹³⁻¹⁶

It is important that all non-proprietary and proprietary names of medicines are developed using the following safety principles:

- ❖ The medicine name should not be liable to confusion with a non-proprietary or proprietary name or an existing product when hand written, typed, printed or spoken.
- ❖ The medicine name should not convey misleading information with regard to composition, clinical action, dose, frequency or administration of the product.
- ❖ The name preferably should consist of one word and avoid qualifications by letters or number. Exceptions may include, for example, insulin mixtures where the name may be followed by numbers representing the fast and slow acting part of the mixture.
- ❖ Innovative labeling can be used to highlight the difference between medicines with look-alike and sound-alike names. Enhanced differentiation should reduce the risk of confusion and mis-selection of medicines with confusable names by the use of Tall Man lettering and coloured lettering on labels and packaging. ²¹⁻²⁹

1- Umbrella names (brand name extensions)

Rules favouring umbrella trademark names should be withdrawn or reconsidered. An umbrella trademark name (also known as brand name extension) for a different combination of medicines with several active pharmaceutical ingredients might lead to confusion. Patients and professionals may not be aware of the difference, which may give rise to errors that lead to unexpected consequences. ¹³

2- International non-proprietary names (INNs)

Attention should be paid to INNs that cause confusion. ³⁰ The likelihood of harmful error should be reduced by:

- ❖ creating lists and computerized alerts in the practice setting
- ❖ emphasizing the differences among INNs prone to confusion
- ❖ simultaneously using drug brand names for redundancy in order to allow a double-check.

Effective and active management of INN-related risks should include:

- ❖ a systematic evaluation of each INN using appropriate risk assessment methods
- ❖ participation in a critical analysis of proposed INNs during WHO public consultations
- ❖ revision by the World Health Organization (WHO) of INNs following associated errors with serious consequences
- ❖ incorporating INNs and common stems into healthcare professional undergraduate curricula.

References

1. Institute of Medicine (USA). Kohn LT; Corrigan JM; Donaldson, Editors. To err is human. Building a safer health system. Committee on quality of health care in America. National Academy Press. Washington (2000). Available at: www.nap.edu/openbook.php?isbn=0309068371
2. Department of Health (England). An organisation with a memory: Report of an expert group on learning from adverse events in the NHS, chaired by the Chief Medical Officer. London (2000). Available at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4065083
3. Department of Health and the Design Council (England). Design for patient safety. A system-wide design led approach to tackling patient safety in the NHS. London. (2003). Available at: www.designcouncil.org.uk/Documents/Documents/Publications/Health/Design%20for%20Patient%20Safety_Design_Council.pdf
4. Department of Health (England). Building a safer NHS for patients: Implementing 'An organisation with a memory' London. (2001). Available at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/Browsable/DH_4097460
5. Department of Health (England). Building a safer NHS for patients: Improving Medication Safety. A report by the Chief Pharmaceutical Officer. London. (2004). Available at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4071443
6. ISMP-España. Boletines: Recomendaciones para la prevención de errores de medicación. Available at: <http://www.ismp-espana.org>
7. Otero López MJ, Garrido Corro B, Domínguez-Gil Hurlé A. Seguridad de medicamentos. Prevención de errores de medicación. *Farm Hosp.* 2004; 4: 305-9. <http://www.ismp-espana.org/ficheros/Fichero19.pdf>
8. Council of Europe. Partial Agreement in Social Health Field. Expert group on Safe Medication Practices. Creating a better medication safety culture in Europe. Strasbourg (2006). Available at: www.coe.int/t/e/social_cohesion/soc-sp/medication%20safety%20culture%20report%20e.pdf
9. Institute of Medicine (USA) Aspden P, Wolcott J, Bootman JL, Cronenwett LR, Editors. Preventing Medication Errors. Committee on Identifying and Preventing Medication Errors. National Academy Press. Washington (2007). Available at: www.nap.edu/catalog.php?record_id=11623
10. National Patient Safety Agency (England and Wales) Helen Hamlyn Research Centre. Design for patient safety: A guide to the graphic design of medication packaging. London (2007). Available at: www.nrls.npsa.nhs.uk/resources/collections/design-for-patient-safety/?entryid45=63053
11. National Patient Safety Agency (England and Wales) Helen Hamlyn Research Centre. Design for patient safety: A guide to the labelling and packaging of injectable medicines. London. 2008. Available at: www.nrls.npsa.nhs.uk/resources/collections/design-for-patient-safety/?entryid45=59831
12. Medicines and Healthcare Products Regulatory Agency (UK). Guidelines on the Labelling and Packaging of Medicines, Guidance Note 25. London (2003). Available at: www.mhra.gov.uk/home/groups/comms-ic/documents/publication/con007554.pdf
13. International Network of Safe Medication Practice Centres (INSMP) Comments on Guideline on the acceptability of names for human medicinal products processed through the centralised procedure CPMP/328/98, Revision 5. (27 April 2007) 7 pages.
14. U.S. Food and Drug Administration (USA) Center for Drug Evaluation and Research (CDER). Guidance for Industry Contents of a Complete Submission for the Evaluation of Proprietary Names. (2010). Available at: www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm075068.pdf
15. Health Canada (Canada) Draft Revised Guidance Document for Industry - Review of Drug Names for Look-alike Sound-alike (LASA) Attributes. (19 February 2013). Available at: www.hc-sc.gc.ca/dhp-mps/consultation/medeff/2013/lasa-pspcs/index-eng.php

16. International Medication Safety Network (INSM) Comments on QRD Recommendations on the expression of strength in the name of centrally authorised human medicinal products (EMA/208304/2009). (28 May 2009). 9 pages. Available at: www.intmedsafe.net/IMSN/FCKuserfiles/file/IMSN%20Comments%20EMA%20QRD%20strength%20recommendations%20May%202009.pdf
17. US Food and Drug Administration (USA) Center for Drug Evaluation and Research (CDER). Draft Guidance on Safety Considerations for Product Design to Minimize Medication Errors. (December 2012). 18 pages. Available at: www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM331810.pdf
18. US Food and Drug Administration (USA) Center for Drug Evaluation and Research (CDER). Draft Guidance on Safety Considerations for Container Labels and Carton Labeling Design to Minimize Medication Errors. (April 2013). 26 pages. Available at: www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM349009.pdf
19. European Medicines Agency (EMA) Medication-errors workshop - Workshop report - 28 February – 1 March 2013 Ref. EMA/144458/2013 (6 May 2013) : 16 pages. Available at: www.ema.europa.eu/docs/en_GB/document_library/Report/2013/05/WC500143163.pdf
20. International Network of Safe Medication Practice Centres (INSMPC) Unit-dose packaging of pharmaceutical products: comments on French Health Products Safety Agency specifications draft. (October 2007). 5 pages. Available at: www.intmedsafe.net/IMSN/FCKuserfiles/file/INSMPC-unitDosePackaging-Oct%202007.pdf
21. Darker IT, Gerrett D, Filik R, Purdy KJ and Gale AG. The influence of ‘Tall Man’ lettering on errors of visual perception in the recognition of written drug names *Ergonomics* 2011; 54: 21-33.
22. Gerrett D, Gale AG, Darker I, Filik R and Purdy KJ The Use of Tall Man Lettering to Minimise Selection Errors of Medicine Names in Computer Prescribing and Dispensing Systems. ITQ Invitation Reference No. : ER-07-0612. National Health Service. NHS Connecting for Health. UK. 2009. Available at: www.connectingforhealth.nhs.uk/systemsandservices/eprescribing/refdocs/tallman.pdf
23. Filik R et al. Drug name confusion: Evaluating the effectiveness of capital (“Tall Man”) letters using eye movement data. *Social Science and Medicine*. 2004; 59: 2597-2601
24. Filik R et al. Medication errors and the judicious use of colour on the labelling of medicines. In P. McCabe (Ed), *Contemporary Ergonomics*. 2004; 351-356
25. Filik R et al. Medication errors and human factors. In P. McCabe (Ed), *Contemporary Ergonomics*. 2003; 471-476.
26. Gabriele S. The role of typography in differentiating look-alike/sound-alike drug names. *Healthcare Quarterly*. 2006; 9(Sp): 88-95.
27. Institute for Safe Medication Practices. ISMP updates its list of drug name pairs with Tall Man letters. *ISMP Medication Safety Alert!* 2010; 15 (23): 1-3.
28. ISMP Canada. Application of TALLman lettering for drugs used in oncology. *ISMP Canada Safety Bulletin* 2010; 10 (8): 1-4.
29. Otero López MJ, Martín Muñoz R, Sánchez Barba M, Abad Sazatornil R, Andreu Crespo A, Arteta Jiménez M, et al, en representación del Grupo de Trabajo TML. Development of a list of look-alike drug names with recommended Tall Man letters. *Farm Hosp*. 2011; 35: 225-235.
30. International Medication Safety Network (IMSN). Position Statement On Improving The Safety Of International Non-proprietary Names of Medicines (INNs). (November 2011). 5 pages.