

## **Position Statement On Improving The Safety Of International Non-proprietary Names of Medicines (INNs)**

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The International Medication Safety Network (IMSN) considers that the systematic use of international non-proprietary names (INNs) in medication practices is a key strategy for improving medication safety. However, since there have been medication errors caused by confusion among INNs, it is important to recognize them and to work on improving their safety, as well.

IMSN calls upon healthcare policy makers, drug regulatory agencies and pharmaceutical companies to improve the legibility of INNs, wherever they are displayed, so that healthcare professionals and patients can easily identify the name of the drug in any situation.

IMSN members are committed to calling attention to INNs that cause confusion, and propose reducing the likelihood of error by creating lists and computerized alerts, emphasising the differences among INNs prone to confusion, and simultaneously using drug brand names as a double-check.

IMSN urges the World Health Organization (WHO) to revise INNs whenever errors would have serious consequences.

IMSN calls for effective and proactive management of INN-related risks: by a systematic evaluation of each INN using appropriate risk assessment methods; by participation in a critical analysis of proposed INNs during WHO public consultations; and by teaching INNs and common stems to healthcare professionals during their undergraduate training.

### **Recognising INN-related medication errors**

Medication error reporting programmes operated by IMSN members have long been drawing attention to the risks of confusion among look-alike and sound-alike drug names, i.e. names that are visually or phonetically similar. Confusion among drug names is responsible for 12% to 15% of reported errors (1). IMSN members publish and regularly update lists of pairs of drug names where a potential for confusion has been identified (2–4). Some have also been published by the WHO (5).

A drug's international non-proprietary name (INN), established under the aegis of the World Health Organization (WHO) before the pharmaceutical company registers its brand name, enables pharmaceutical substances to be identified in the same way throughout the world (6). Mix-ups caused by INNs are less frequently reported than those caused by brand names (7). INNs are designed first and foremost to identify active pharmaceutical substance drug names easily and unequivocally all over the world. INNs are relatively safer because the principles underlying their design by the WHO INN

programme are the same that apply to the prevention of errors: standardisation, differentiation, redundancy and facilitation of logic checks (1,8).

However, the use of INNs does not completely prevent problems: the risk of error remains, through mistaking one INN for another, due in part to the increasing number of INNs in circulation. Multiple factors increase the likelihood of drug name confusion: perception errors, where names that look or sound alike are misread or misheard, or where legibility is compromised (due to poorly designed labelling for example); short-term memory errors, resulting in slips and lapses; motor coordination errors (for example selecting the wrong drug from a list on a computer screen); cognitive problems, due to overload caused by a distracting work environment or to a gap in one's knowledge, etc. (7). Action on these contributory factors is urged to reduce the incidence of INN-related errors by taking corrective measures, or, better still, preventive measures.

- **IMSN is calling for effective measures to prevent INN-related errors, aimed at various facets of the problem, and urges the individuals and organisations concerned (healthcare policy makers, drug regulatory and patient safety agencies, educators, professional organisations, pharmaceutical companies, etc.) to both support the WHO INN programme's efforts to make INNs safer, and undertake to improve their conditions of use.**

## **Reducing the risk of INN-related errors**

INNs must be displayed clearly and legibly on drug labelling at every packaging level, including the immediate packaging of each unit of use and on dispensing labels (1). The INN must also be prominent on package leaflets, drug formularies and computerised drug lists (1).

When a risk of confusion is identified among INNs, the IMSN proposes corrective measures such as:

- alerting healthcare professionals by circulating a list of the groups (usually pairs) of drug names prone to error, or implementing computerized reminders/alerts in hospital and community pharmacy administration systems, prescription systems, etc. (9);
- referring to a drug by both its INN and its brand name, as an additional safeguard to aid in differentiating among medicinal products, thus providing a redundancy control (10,11,12);
- improving differentiation among error-prone INNs by highlighting the dissimilar parts with upper-case letters plus other typographic resources (See the note on 'Tall Man' lettering) (1,5,13).

- **IMSN calls upon healthcare policy makers, drug regulatory agencies and pharmaceutical companies to improve the legibility of INNs without delay, wherever they are displayed, so that healthcare professionals and patients can identify the drug's true name in any healthcare situation.**

## **Revising INNs with the highest risk of error**

Health authorities should ensure that all (or at least the most serious) medication error reports related to INNs are shared with the WHO INN programme and eventually with the national drug naming committees. Where an INN causes serious and frequent errors, an official procedure to revise the INN can be envisaged (6). Since 2005, if a recommended INN gives rise to medication errors because of similarity with other terms or names, a proposal for substitution can be filed by "*any interested person*". If, after consultation with member states and "*any other persons known to be concerned by the proposed substitution*", the substitution appears justified, the INN Expert Group will

design a new INN (6). However, such substitution proposals should be approved by a significant number of member states to support them and to avoid jeopardising the basic principles of the WHO INN programme (1).

- **IMSN urges healthcare policy makers, drug regulatory agencies and patient safety agencies to address the problem to the WHO every time they are informed of serious consequences of INN-related errors. IMSN and its members are prepared to notify them of such incidents.**
- **IMSN calls upon the WHO INN programme and national drug naming committees to systematically implement risk analysis methods, particularly after errors have been reported, in order to examine whether the INN should be changed.**

## **Effective and lasting prevention of INN-related errors**

The best way to prevent medication errors is through proactive strategies. In this context, and following the example of the brand name assessment methods required by certain drug regulatory agencies, proposed INNs should be assessed for safety, such assessment to include the review of the proposed INNs by healthcare users and patients to ensure in-use safety (1,13,14). Useful additions to the efforts of the WHO INN programme to prevent INN-related errors would be:

- systematic predictive risk assessment methods for analysing the risks of confusion in real-life healthcare situations to make them safer (1);
- active participation of healthcare professionals in public consultations on proposed INNs, to identify any risks of confusion in healthcare settings (1).

The publication of proposed INNs in the *WHO Drug Information* bulletin is particularly valuable. It allows any “*persons known to be concerned with a name under consideration*” to file comments or objections during the four months following its publication (6). The ad hoc group on safe medication practices convened by the Council of Europe recommends making use of these public consultations to identify proposed INNs liable to pose a risk (1).

- **IMSN calls on healthcare professionals to take part in the critical analysis of proposed INNs in WHO public consultations, even though the properties of substances under development are uncertain and their harm-benefit balance has not yet been established.**

Finally, well before any corrective measures are taken, the first step toward reducing the risk of confusion is to improve healthcare professionals’ knowledge of what INNs and their common stems mean. The exclusive use of brand names in many countries when teaching pharmacology and pharmacotherapy to healthcare professionals fosters ignorance of INNs. INNs are much less likely to be confused when they are properly understood by all INN users, healthcare professionals and patients. Furthermore, the systematic use of INNs by healthcare professionals reduces the number of drug names they have to remember in everyday practice, with a corresponding reduction in the risks due to cognitive overload in healthcare settings.

- **IMSN stresses the importance of healthcare professionals’ learning about INNs and common stems during their undergraduate training, with particular emphasis on the systematic use of INNs in pharmacology and pharmacotherapy teaching.**

**In summary**, the use of INNs instead of brand names in medication practices should be promoted with a view to improving medication safety. Therefore, IMSN advocates the systematic use of INNs rather than brand names. However, the safety of INNs can only be improved through better understanding, better education, better differentiation, and rapid resolution of any identified confusion.

IMSN is aware of the difficulties of designing INNs and their common stems, and is keen to take action to make them safer. IMSN urges everyone to be vigilant and declares its readiness to cooperate with all organisations concerned, starting with the WHO INN programme.

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**Note on 'Tall Man' lettering:** 'Tall Man' lettering is a typographic technique that uses selective capitalisation to help make similar looking drug names more easily differentiable. The FDA published the first list of drug name pairs differentiated by 'Tall Man' lettering in 2001 (15). Since then, IMSN members have developed similar lists (16–19). Although recent studies suggest that, under experimental conditions, 'Tall Man' lettering reduces the incidence of errors due to drug name confusion, its efficacy and standardisation, and the legibility of common stems still need to be clarified. IMSN members are currently studying these issues (13,20–24).

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