



This is the first of a series of special newsletters describing the work of CIOMS member organizations and partners. It describes the programme within the World Health Organization (WHO) that assigns International Nonproprietary Names (INNs) to medicines.

The WHO INN Programme: International Nonproprietary Names for pharmaceutical substances

With tens of thousands of medicines on the market, confusion between medicine names can have serious consequences for patient safety. WHO assigns single, unique, globally accepted names to pharmaceutical substances. The International Nonproprietary Names (INN) nomenclature provides a common language for people all over the world—including the CIOMS Working Groups—to work together for the safe and effective use of medicines.

- Medicine names: a safety issue
- How INNs are defined
- INNs – a map to medicines classes
- The INN MedNet
- The School of INN (SoINN)
- INNs for better medicines use

Medicine names: a safety issue

A medicine can be identified in different ways: by its brand name (“Aspirin”) or its chemical name (acetylsalicylic acid). Furthermore, historically some regulatory authorities have approved nonproprietary names for pharmaceuticals in their jurisdictions (*e.g.*, *paracetamol* in Europe, *acetaminophen* in the US). A brand name can designate a medicine containing more than one active substance, and often the same active substance is sold under different brand names.

This variety of names can cause confusion, which might lead to medication errors.

Patient safety is a primary concern of WHO. In 1950 the Organization established the **INN Programme** for pharmaceutical substances to mitigate the risk of name confusions and medication errors. The main objective of the programme is to define a single, unique, globally accepted name for each pharmaceutical substance.

The variety of names for medicines can lead to confusion, with a potential impact on patient safety.

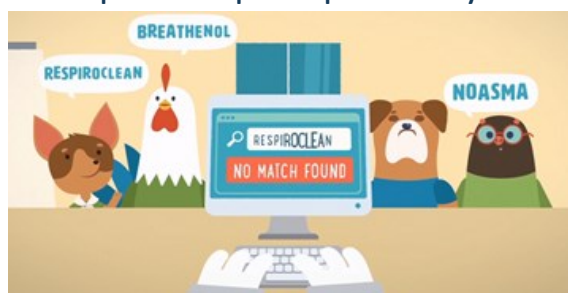


Illustration from: School of INN. YouTube video. Link available at: www.who.int/medicines/services/inn/

How INNs are defined

The selection of a new INN relies on a strict procedure which is based on a broad consultative process. Pharmaceutical companies or national naming authorities—such as the United States Adopted Names Council (USANC)—submit an application to the WHO INN Secretariat. The INN Expert Group then collaborates with national nomenclature commissions, pharmacopoeial commissions, academics and regulatory authorities to select a name.

The lists of proposed INNs are published in the [WHO Drug Information](#) journal¹ for a four-month comment period. If no objection is raised to the proposed name during that period, the INN becomes a norm recommended to all WHO Member States. WHO makes INNs universally available in the public domain, hence their designation as nonproprietary. They can be used without any restriction whatsoever to identify pharmaceutical substances. Nowadays the national nonproprietary names are typically adopted in countries once an INN is recommended by WHO. Differences between INNs and national names are therefore becoming more and more rare.

In recent years the INN Programme has opened the door for frequent dialogue with a wide range of parties. Feedback from developers and manufacturers of pharmaceutical substances, health professionals' associations, patient advocates and consumer organizations is valued and considered in the INN selection process. This is done to raise greater awareness of the INN nomenclature and to advocate for its use to ensure patient safety.

INNs – a map to medicines classes

INNs must be distinctive in sound and spelling, and should not be liable to confusion with other names in common use (e.g. trade marks). Usually, an INN consists of a common stem and a random, invented prefix (1). Pharmacologically related substances show their relationship by the use of a common stem. For example, angiotensin II receptor antagonists are given the suffix “-sartan”, as in *candesartan* and *losartan*. In this way INNs provide a mapping of medicines classes that can be very helpful in clinical practice.

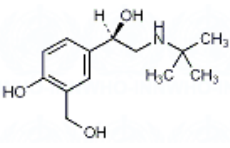
¹ www.who.int/medicines/publications/druginformation/innlists/

The INN MedNet

The [WHO INN MedNet](#)—a secure electronic platform administered by WHO—offers two services related to INNs:

- (1) **On-line queries** of WHO INN information on specific medicines (see example below), lists of proposed and recommended INNs, and status tracking for new INNs within the consultation and publication process; and
- (2) a link to the Programme's **e-Application system** to apply for new INNs electronically.

Access to the INN MedNet is free of charge and can be requested at <http://mednet.who.int/inn>.

INN	
salbutamol	
	and enantiomer et énantiomère y enantiomero
Latin	salbutamolum
French	salbutamol
Spanish	salbutamol
Russian	сальбутамол
Arabic	سالبوتامول
Chinese	沙丁胺醇
Phonetic	salbutamol
Molecular formula	C ₁₃ H ₂₁ NO ₃
ATC Codes	R03AC02 R03CC02
National commission(s)²	Alternate name(s)
DCIT	salbutamolo
JAN	salbutamol sulfate
Ph. Int.	salbutamoli sulfas
RS	salbutamol sulfate
USAN	albuterol
USAN	albuterol sulfate
USP	albuterol
National commission(s) using same name:²	
BAN; BPC; ChP; CSP; DCF; FEUM; IP; JP; Ph. Eur.; Ph. Int.; RS	

Adapted from: INN MedNet;

<https://mednet-communities.net/inn/db/searchinn.aspx>

² **BAN** (British approved name); **BPC** (British Pharmaceutical Codex); **ChP** (Pharmacopoeia of the People's Republic of China); **CSP** (Czechoslovak Pharmacopoeia - retired; now: Czech Pharmacopoeia); **DCF** (Dénomination Commune Française – approved name in France); **DCIT** (Denominazione Comune Italiana – approved name in Italy); **FEUM** (Farmacopea de los Estados Unidos Mexicanos – Mexican Pharmacopoeia); **IP** (Indian Pharmacopoeia); **JAN** (Japanese Accepted Name); **JP** (Japanese Pharmacopoeia); **Ph. Eur.** (European Pharmacopoeia); **Ph. Int.** (International Pharmacopoeia of WHO); **RS** (WHO International Chemical Reference Substance); **USAN** (United States Adopted Name); **USP** (United States Pharmacopoeia).

The School of INN (SoINN)

Why is it needed?

Any student of pharmacology and therapeutics will tell you that remembering names of pharmaceutical substances and their mechanisms of action is one of the most challenging tasks in their courses. Students tend to learn medicine names by rote, which can be daunting when examination approaches.

The challenge does not end there. Throughout their career health care professionals have to keep up with a continuous stream of names of new active pharmaceutical substances introduced into clinical practice, their mechanisms of action and how they work differently from existing medicines.

Meetings conducted over the years and a recent survey involving more than 1000 respondents (2) revealed an emerging need for a more prominent source of information on the INN nomenclature system. INNs are widely used in the scientific literature. The survey showed that although INNs are increasingly used in teaching, in practice many prescribers still prefer using brand names.

A systematic understanding of INNs in different pharmacological classes would be helpful for applicants, health care professionals, academic staff and students (3). To advocate for the wide and correct use of the INN nomenclature, WHO has established the School of INN (SoINN).

What are the goals?

The goals of the SoINN are to:

- advocate for the correct and effective use of INN;
- develop and raise interest in the science of pharmaceutical nomenclature; and
- cultivate the future success and harmonization of nomenclature programmes around the world.

The School is intended for health professionals, students, academia, patients or consumers and the pharmaceutical industry. It aims to achieve its goals in three ways: (1) Regular publications and presentations, (2) education and training to promote safe and effective use of medicine and to facilitate learning; and (3) outreach to promote a basic understanding of INNs and how their use can enhance pharmaceutical outcomes.

How does it work?

The SoINN is a **virtual** school managed by the INN Programme. The SoINN has been developed on [Moodle](#), a free and open-source learning platform. The School is designed to offer contributions from different INN stakeholders, and provides functionality for *ad hoc* sharing of courses or information with user groups based on different pre-defined user profiles.

The website is organized in three main categories ([see below](#)), with additional links for announcements, navigation and searching of stems in INN names.

Sections on the School of INN website

Video about INNs



A "**How to**" series of lessons on how to access and use INN services like the INN online application, the INN MedNet and others.



MedNet: On-line information services related to INN (see previous page)



School of INN: a series of educational modules such as the INN training courses, INN for pharmacologists, and others

Site announcements
Forthcoming meetings



Navigation

Home
Site announcements
▶ Courses



Search INN

(limited to 5 items)

Contact the [INN Programme](#) for more information

INNs for better medicines use

Beyond its educational aims the School of INN is intended to raise interest in the science of nomenclature and help cultivate a future generation of INN experts. The original aim of the INN system was to increase patient safety, making sure that “a prescription filled abroad is what doctor ordered back home”(4). However, the use of INNs has added benefits for individual patients and for public health. Because INNs provide a key to understanding medicine names and classes, they can assist clinicians in prescribing the most appropriate medicine for their patients.

The number of requests for INN is constantly growing, particularly for new biological medicines such as fusion proteins, monoclonal antibodies and advanced therapy substances. The complex structures and mechanisms of action of these medicines pose new naming challenges. The INN Programme is adapting its policies to assign names

The inclusion of INNs on labels ensures that prescribers and patients can easily identify the active pharmaceutical ingredient(s) in a medicine.



Illustration from: School of INN. YouTube video. . Link available at: www.who.int/medicines/services/inn/

that are informative, short and euphonic (5).

INNs are widely used in clinical practice, with many benefits. One of them is that they facilitate the use of substitution policies: They make it easier for health care professionals to select the most affordable among different medicines that contain the same active ingredient(s) and have been found to be therapeutically equivalent in a regulatory assessment. At a time of rising medicines costs in health care systems, globally accepted names for pharmaceutical substances can help to orientate health professionals and patients within a complex pharmaceutical market, empowering them to identify alternatives and access needed treatment.

References

- 1 WHO. [Guidance on the Use of International Nonproprietary Names \(INNs\) for Pharmaceutical Substances](#). Geneva: World Health Organization; 2017.
- 2 Chui WK, Mignot G, Romeo A, Malan SF, Rizzi M, Balocco R. [Survey about International Nonproprietary Names \(INN\)](#). *WHO Drug Information* 2017; 31(4): 581-585.
- 3 Chui WK, Mignot G, Malan SF *et al*. *The Science of Nomenclature. INN as Global Language for Education and Practice*. 2018 (manuscript in preparation).
- 4 WHO Director General. In: [Working for health: An introduction to WHO](#). Geneva: World Health Organization; 2007.
- 5 Robertson JS, Chui WK, Genazzani AA *et al*. *The INN Global Nomenclature of Biological Medicines: a continuous challenge*. 2018 (manuscript in preparation).

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