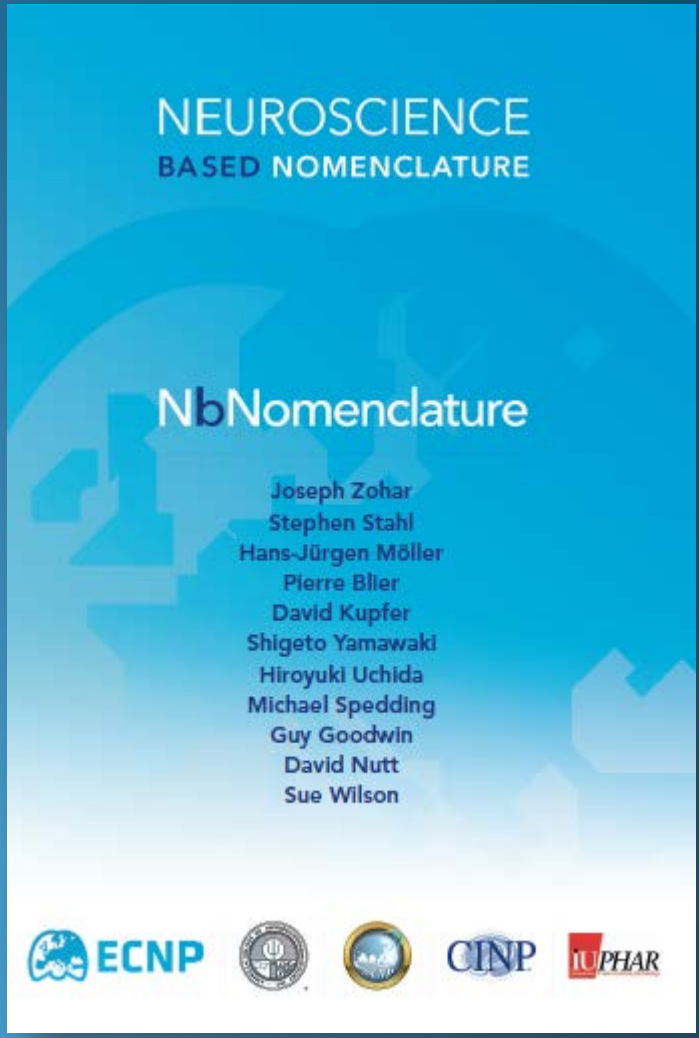
NbN

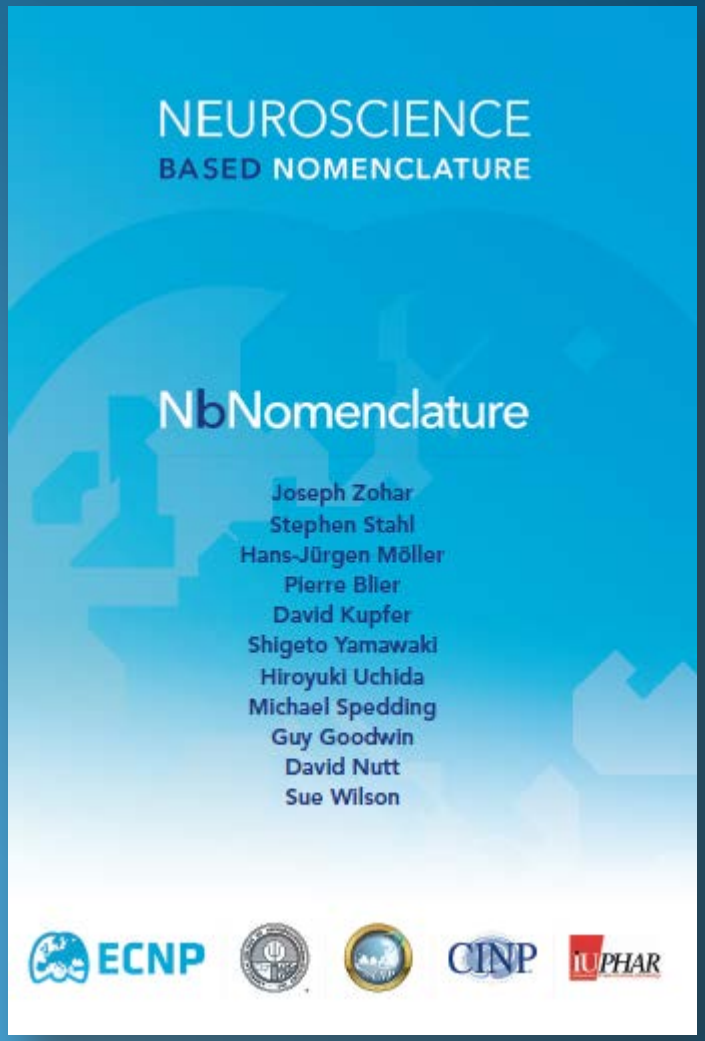
Neuroscience based Nomenclature



NbN

Neuroscience based Nomenclature

Joseph Zohar
Tel Aviv University,
Israel



Could infusion of neuroscience change an outdated naming of psychiatric medication ?

The current nomenclature of psychiatric medications include ;

Antidepressant
Antipsychotic
Anxiolytic
Hypnotic
Mood stabilizer
Stimulant
Anti-dementia
Other

Very often we prescribe "**antidepressants**" for anxiety disorders or "**second generation antipsychotics**" to depressed patients who show no evidence of psychosis.

Current nomenclature and adherence

Anxious patients:

"Why are you giving me an antidepressant for my anxiety?"

Depressed patients:

"Is my condition so bad that you are giving me an antipsychotic?"

The current naming (nomenclature) of psychiatric medications

confusing

For **patients**, to be prescribed antipsychotics or anticonvulsants may carry the false implication that they have psychosis or epilepsy and, consequently, impact (decrease) adherence.

The current nomenclature of psychiatric medications include ;

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Anxiolytic
Hypnotic
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Stimulant
Anti-dementia
Other

For prescribers, it may limit the way they think about treatment alternatives and in some examples, influences choice through marketing techniques.

The problem

Current nomenclature does not help the clinician to make informed choices .

Example from our colleagues:

- Treating hypertension –
  - nomenclature is based on mechanism

Example: Treating hypertension – nomenclature based on mechanism

- Diuretics
- Beta-receptor-blockers
- Calcium antagonists
- ACE inhibitors
- Angiotenin II antagonists

- Hence, the nomenclature could serve as a tool which helps the clinician to make informed decisions.

- e.g. Our colleagues in hypertension utilize the nomenclature to make an informed decision, i.e. augmenting (if needed) with medications that act on different mechanisms

The Problem:

- Existing Nomenclature does not

  –help the clinician to make informed choices

Questions that are often raised;

Should

"second generation antipsychotics"

be used in MDD or PTSD or OCD ?

.

A **‘second generation’** drug sounds like an advance on an **‘old’** drug.

‘second generation’

Mobile customers are in for a treat from Samsung as the Galaxy S II smartphone hits the market. Building on the smashing success of the original Galaxy S, its second generation comes packed with more processing power, a better display and the latest version of Android.

- We also have 1st and 2nd generation mobile phones

LA 2008: 2010 Lexus RX 450h live unveiling

by **Sebastian Blanco** (**RSS feed**) on Nov 19th 2008 at 6:09PM

Click above for our high res gallery

Ten years after introducing the "car-based luxury utility vehicle segment," Lexus unveiled its latest hybrid, the 2010 RX 450h, today at the Los Angeles Auto Show. The second-gen RX 450h uses a 3.5 liter V6 gas engine (Atkinson cycle) and an upgraded inverter for a total of 295 hp in a luxury SULEV package. It's so luxury you

- We also have 1st generation and 2nd generation cars

Current nomenclature and Marketing:

We have

- 1st generation antipsychotics and
- 2nd generation antipsychotics

Former terminology	NbN		Drugs
Indication-based	(Pharmacological-based)		
	Pharmacology	Mode of action MM; multimodal (e.g. more than one mode)	
Antipsychotics	Drugs for psychosis		
(Typical (1st generation)	dopamine	receptor antagonist (D2)	flupenthixol, fluphenazine, haloperidol, perphenazine, pimozide, pipotiazine, sulpiride, trifluoperazine, zuclopenthixol
	dopamine, serotonin	receptor antagonist (D2, 5-HT2)	chlorpromazine, thioridazine
Atypical (2nd generation)	dopamine	receptor antagonist (D2)	amisulpiride
	dopamine, serotonin	receptor antagonist (D2, 5-HT2)	iloperidone, loxapine, lurasidone, olanzapine, perospirone, sertindole, ziprasidone, zotepine
	dopamine, serotonin	receptor partial agonist (D2, 5-HT1A)	aripiprazole
	dopamine, serotonin, noradrenaline	receptor antagonist (D2, 5-HT2, NE alpha-2)	asenapine, clozapine, risperidone, paliperidone
		MM; receptor antagonist (D2, 5-HT2) and reuptake inhibitor (NET)(metabolite)	quetiapine

Nomenclature could (and should) serve as a **tool** which helps the clinician to make **informed** choices .

Does the term

"second generation antipsychotics"

actually help us to make an informed choices ?

Does the term

“ Antidepressants ”

actually help us to make an informed choices ?

NbN Glossary

Former terminology	NbN		Drugs
Indication-based	(Pharmacological-based)		
	Pharmacology	Mode of action MM; multimodal (e.g. more than one mode)	
Antidepressants	Drugs for depression		
(TCA)	norepinephrine	reuptake inhibitor (NET)	desipramine
	norepinephrine, serotonin	reuptake inhibitor (NET and SERT)	protriptyline,lofepramine, amoxapine, nortriptyline
	serotonin, norepinephrine	reuptake inhibitor (SERT and NET)	imipramine, dosulepin,
	serotonin	reuptake inhibitor (SERT)	clomipramine
	serotonin, norepinephrine	MM; reuptake inhibitor (SERT and NET), 5-HT2 receptor antagonist	amitriptyline
	norepinephrine, serotonin	MM; reuptake inhibitor (NET and SERT), 5-HT2 receptor antagonist	doxepin
	serotonin, dopamine	receptor antagonist (5-HT2 and D2)	trimipramine

* The glossary includes only the psychotropics relevant to former terminology. Newer medications or psychotropics not included here could be found in NbN by their name

Former terminology	NbN		Drugs
Indication-based	(Pharmacological-based)		
	Pharmacology	Mode of action MM; multimodal (e.g. more than one mode)	
Antidepressants	Drugs for depression		
(MAOI)	serotonin, norepinephrine, dopamine	enzyme inhibitor (MAO-A and -B)	isocarboxazid, phenelzine
		reversible enzyme inhibitor (MAO-A)	moclobemide
		MM; enzyme inhibitor (MAO-A and -B), releaser (DAT, NET)	tranylcypromine
	dopamine, norepinephrine, serotonin	enzyme inhibitor (MAO-B and -A)	selegiline
(SSRI)	serotonin	reuptake inhibitor (SERT)	citalopram, escitalopram, fluoxetine, fluvoxamine, paroxetine, sertraline
(SNRI)	serotonin, norepinephrine	reuptake inhibitor (SERT and NET)	venlafaxine, duloxetine
	norepinephrine, serotonin	reuptake inhibitor (NET and SERT)	milnacipran

The problem

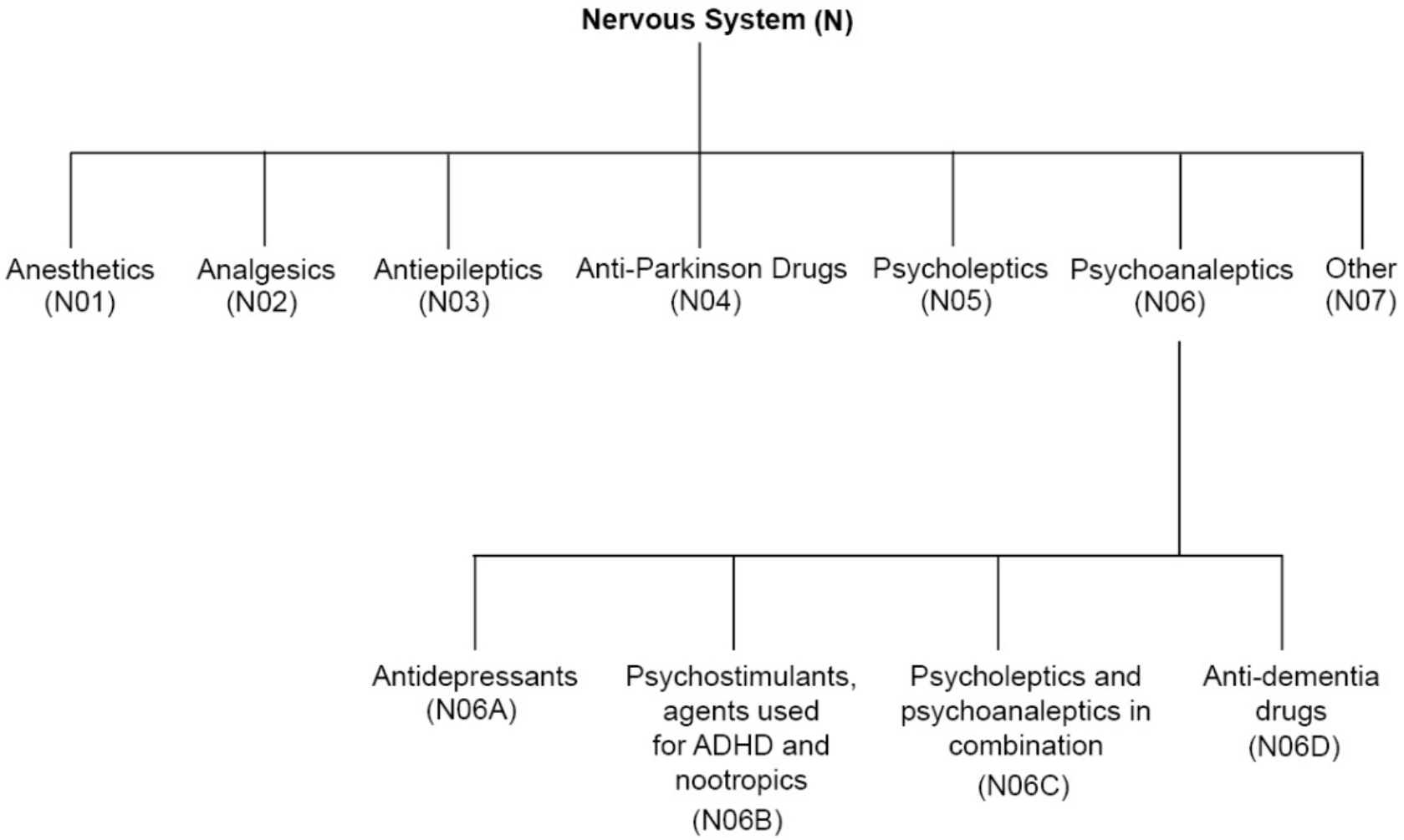
Current nomenclature does not help the clinician to make informed choices .

The Problem:

- Existing Nomenclature does not

reflect the current scientific knowledge

Current nomenclature for psychotropic drugs under the WHO system (adapted from Guidelines for ATC classification and DDD assignment 2015)



Current antidepressant nomenclature under the WHO system (adapted from Guidelines for ATC classification and DDD assignment 2015).

Antidepressants
(N06A)

Non-selective monoamine reuptake inhibitors (N06AA)
e.g. imipramine, amitriptyline, clomipramine, dosulepin, doxepin, lofepramine, trimipramine, amoxapine, protriptytine (TCAs), desipramine, nortriptyline, maprotline (NRIs)

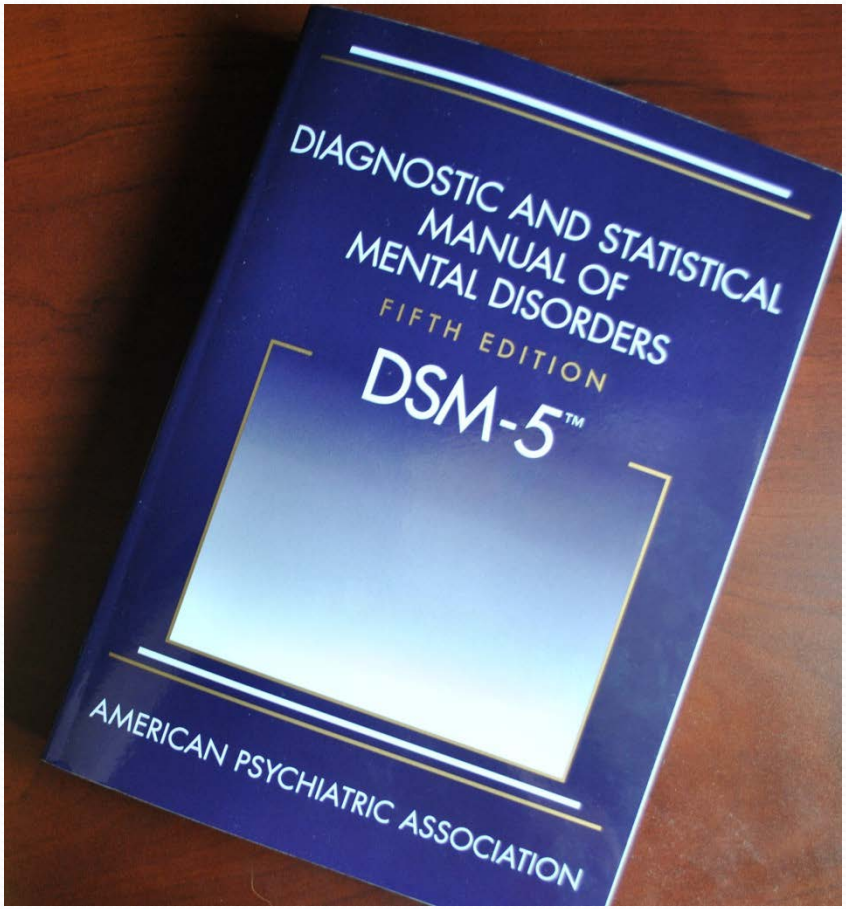
Selective serotonin reuptake inhibitors (N06AB)
e.g. Zimeldine, fluvoxamine, fluoxetine, paroxetine, sertraline, citalopram, escitalopram

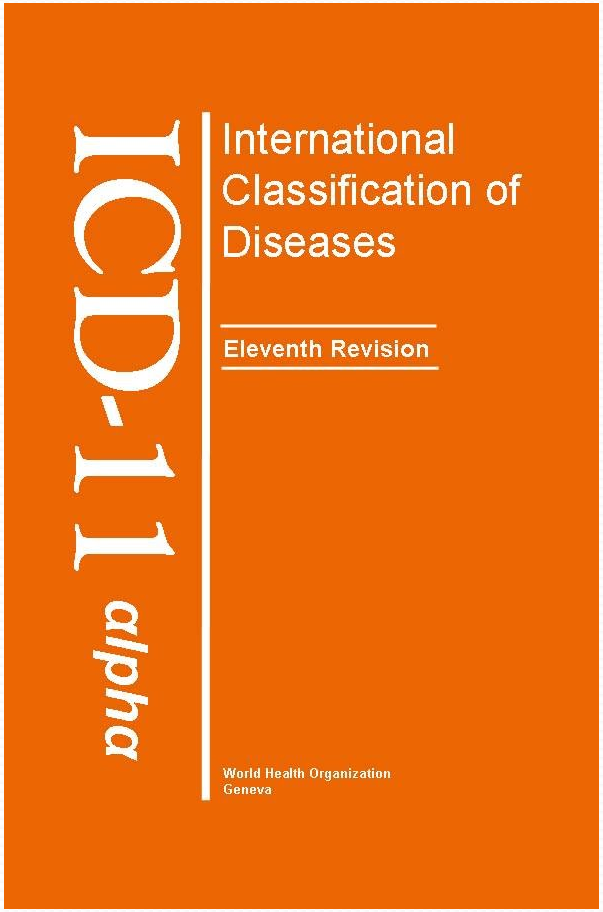
Monoamine oxidase inhibitors, non-selective (N06AF)
e.g. Phenelzine, isocarboxazid, tranylcypromine

Monoamine oxidase A inhibitors (N06AG)
e.g. Moclobemide, tobxatone

Other antidepressants (N06AX)
e.g.
reboxetine **(NRIs)**
venlafaxine, milnacipran, duloxetine **(SNRIs)**
nomifensine, bupropion **(NDRIs)**
mirtazapine **(NaSSAs)**
trazodone, nefazodone **(SARIs)**
agomeiatine **(MT receptor antagonist/5-HT2c antagonist)**
gepirone **(5-HT1A partial agonist)**

Diagnosis updates going on (DSM 5, ICD 11th)





Our expectations from a psychotropic nomenclature are that it should:

(a) Be based on contemporary knowledge.

(b) Help clinicians to make informed choices when working out the next "pharmacological step.“

(c) Provide a system that does not conflict with the use of medications.

(d) Be future proof and to accommodate new types of compounds

None of them are true for the current nomenclature

The current naming (nomenclature) of psychiatric medications

confused and confusing

Introduction

It has become clear that the current nomenclature of psychotropic medications does not reflect contemporary knowledge, nor does it appropriately inform the clinician about rational neuroscience-based prescribing.

The taskforce

Five major international neuropsychoparmacological scientific organizations joined forces together to create this nomenclature.

These organizations are:

ECNP - European College of Neuropsychopharmacology
ACNP - American College of Neuropsychopharmacology
AsCNP - Asian College of Neuropsychopharmacology
CINP - International College of Neuropsychopharmacology
IUPHAR - International Union of Basic and Clinical Pharmacology

The composition of the taskforce is:

Chair: Joseph Zohar, European College of Neuropsychopharmacology

Stephen Stahl, International College of Neuropsychopharmacology

Hans-Jürgen Möller, International College of Neuropsychopharmacology

Pierre Blier, American College of Neuropsychopharmacology

David Kupfer, American College of Neuropsychopharmacology

Shigeto Yamawaki, Asian College of Neuropsychopharmacology

Hiroyuki Uchida, Asian College of Neuropsychopharmacology

Michael Spedding, International Union of Basic and Clinical Pharmacology

Guy Goodwin, European College of Neuropsychopharmacology

David Nutt, European College of Neuropsychopharmacology

Coordinator: Sue Wilson, Imperial College of London

The mission

- To help **clinicians** to make informed choices when they are trying to figure out what would be the next "pharmacological step."

The mission

- To **decrease stigma** and **enhance adherence** by a naming system that lays out the rationale for selecting a specific psychotropic.

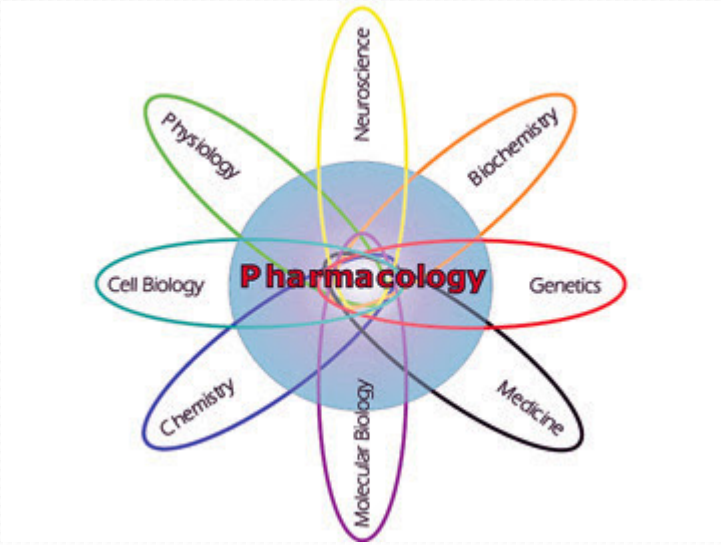
All the expenses related to developing this nomenclature were covered by **ECNP**. Throughout the entire process there was no direct or indirect support from any pharmacological company or other organization.

The proposal

-.

A proposal for an updated naming (nomenclature) of psychiatric medications

- **Pharmacologically-driven** (rather than indication-based) nomenclature that embeds contemporary neuroscience understanding of how medicines act.



NbN is pharmacological driven nomenclature focusing on **Pharmacology** and **mode of action** – Reflects current knowledge and understanding about the targeted neurotransmitter/ molecule / system being modified + mode / mechanism of action

The Nomenclature

Pharmacology

Mode of Action

Pharmacological domains

1	Acetylcholine
2	Dopamine
3	GABA
4	Glutamate
5	Histamine
6	Ion Channel
7	Melatonin
8	Norepinephrine
9	Opioid
10	Serotonin

Modes / mechanisms of actions (MoA)

1	Receptor agonist
2	Receptor partial agonist
3	Receptor antagonist
4	Reuptake inhibitor
5	Reuptake inhibitor and releaser
6	Reuptake inhibitor and receptor antagonist
7	Enzyme inhibitor
8	Ion channel blocker
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Expanding our vocubulery.

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Developing new language

NbN clarify the rational for choosing a certain medication

NbN and adherence

Depressed patients:

I am recruiting also the dopaminergic system to help you to get out of your depression

NbN provide a strategy for naming novel drugs, yet to be discovered, that target novel pharmacological domains or novel mechanism of action.

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All of them are true for the NbN

European Neuropsychopharmacology (2014) 24, 1005–1014

ELSEVIER

www.elsevier.com/locate/euroneuro

A proposal for an updated neuropsychopharmacological nomenclature

Joseph Zohar[a,*], David J. Nutt[b], David J. Kupfer[c], Hans-Jurgen Moller[d], Shigeto Yamawaki[e], Michael Spedding[f,1], Stephen M. Stahl[g,h]

European Neuropsychopharmacology (2015) 25, 2318–2325

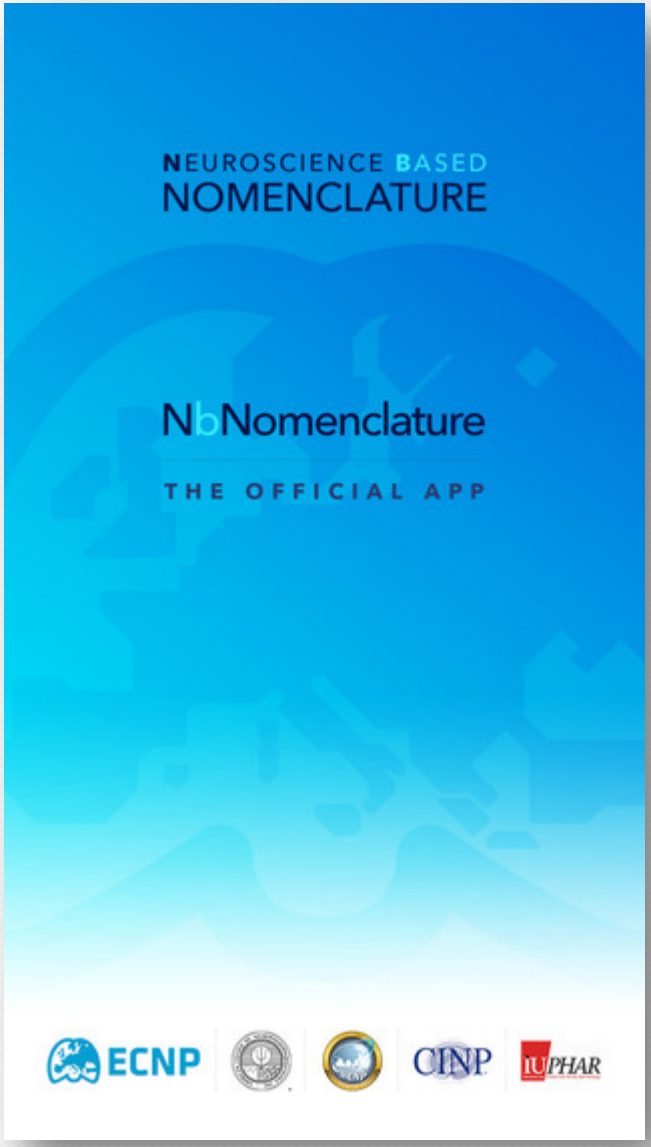
ELSEVIER

www.elsevier.com/locate/euroneuro

A review of the current nomenclature for psychotropic agents and an introduction to the Neuroscience-based Nomenclature

Joseph Zohar[a,*], Stephen Stahl[b], Hans-Jurgen Moller[c], Pierre Blier[d], David Kupfer[e], Shigeto Yamawaki[f], Hiroyuki Uchida[g], Michael Spedding[h], Guy M. Goodwin[i], David Nutt[j]

The NbN


NEUROSCIENCE BASED
NOMENCLATURE
NbNomenclature
THE OFFICIAL APP
ECNP
CINP
IUPHAR

4 additional dimensions

1	**Approved indications**	Based on the recommendations of major regulatory bodies (e.g. FDA, EMA, etc.)
2	**Efficacy and side effects**	Aimed to highlight the situations where the compound fell short of approval for a formal indication, although there is evidence to support its use, for example, in expert guidelines. In the side effects part, only prevalent or life-threatening side-effects are included.
3	**“Practical note”**	Summarizes the clinical knowledge that has been "filtered" though the taskforce "sieve".
4	**Neurobiology**	Derived from empirical data and divided into preclinical and clinical sections, with an emphasis on the latter.

It also includes **4 additional dimensions**:

1. Approved indications –

Is based on the recommendations of major regulatory bodies (e.g. FDA, EMA, etc.)

2. Efficacy and side effects –

aimed to highlight the situations where the compound fell short of approval for a formal indication, although there is evidence to support its use, for example, in expert guidelines.

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3. **“Practical note”**

summarizes the clinical knowledge that has been prioritized by "filtering" though the taskforce’s "opinion sieve".

4. **Neurobiology** –

is derived from empirical data and divided into preclinical and clinical sections, with an emphasis on the latter.

4 Additional Dimensions

Approved Indication

Efficacy & Side Effect

Practical Notes

Neurobiology

For those who would like to know more about the pharmacology, there is a direct link to the relevant site of **IUPHAR** – our collaborator in this endeavor.

Psychotropics included

In this first edition of the NbN, we included **108 compounds** which cover the vast majority of psychotropics used worldwide. We did not include formulations which combine medications.

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The Nomenclature

Pharmacology

Mode of Action

4 Additional Dimensions

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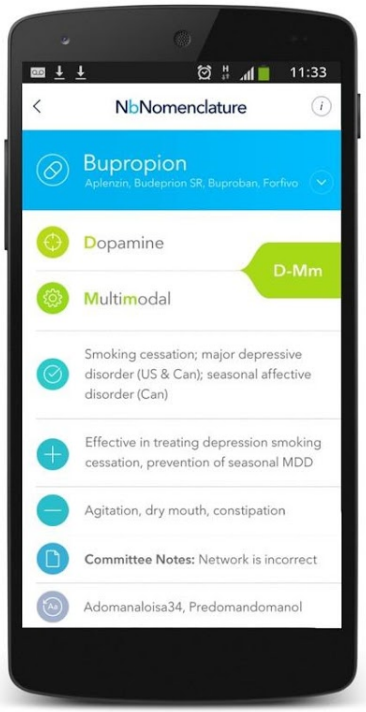
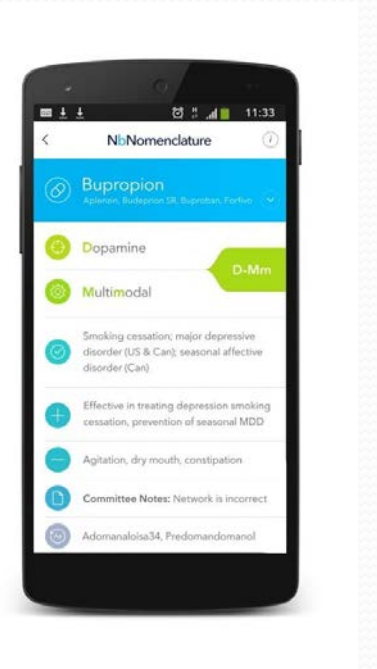
NbN App

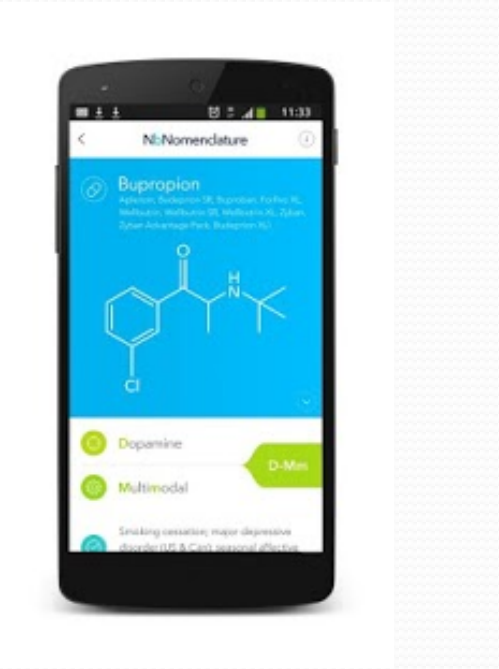

NEUROSCIENCE BASED
NOMENCLATURE
N Nomenclature
THE OFFICIAL APP
ECNP


11:33
NbNomenclature
Bupropion
Aplenzin, Budeprion SR, Buproban, Forfivo
Dopamine
Multimodal
D-Mm
Smoking cessation; major depressive disorder (US & Can); seasonal affective disorder (Can)
Effective in treating depression smoking cessation, prevention of seasonal MDD
Agitation, dry mouth, constipation
Committee Notes: Network is incorrect
Adomanaloisa34, Predomandomanol


11:33
NbNomenclature
Bupropion
Dopamine
Multimodal
D-Mm
H
N
Cl

To download the App, search for *NbNomenclature* on Google Play and iTunes App Store





Conclusions

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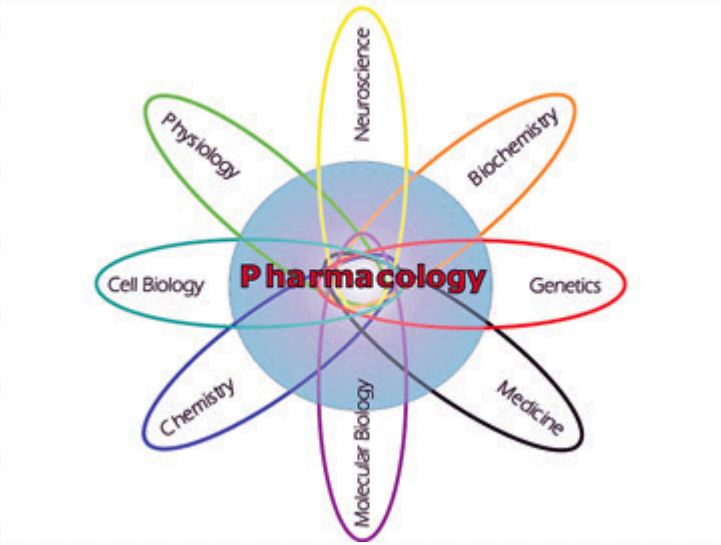

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The Nomenclature

Pharmacology

Mode of Action

4 Additional Dimensions

Approved Indication

Efficacy & Side Effect

Practical Notes

Neurobiology

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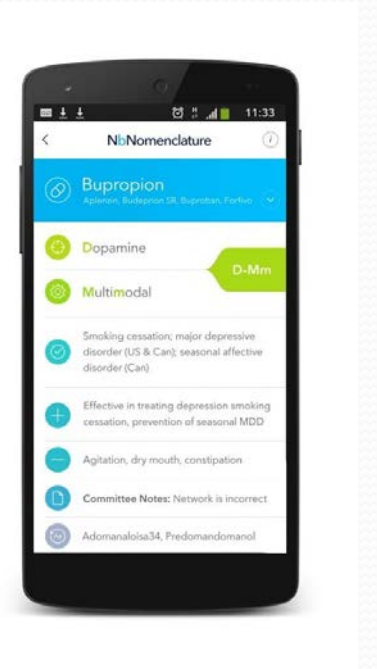
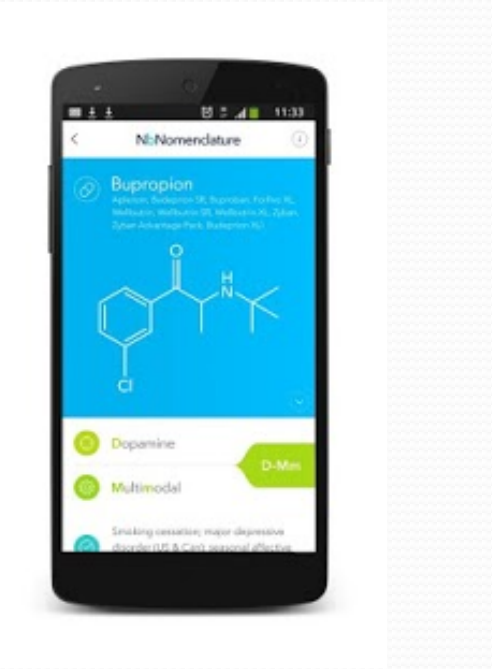




NbN

2016

NbN Updates

Translations

Japanese

Spanish

Korean

Chinese

Russian

NbN Updates

Journals participating in the "first wave"

Biological Psychiatry

Neuropsychopharmacology

World Journal of Biological Psychiatry

J Psychopharmacology

European Archives of Psychiatry and Clinical Neuroscience

Clinical Psychopharmacology and Neuroscience,

Korean Journal of Psychiatry

British Journal of Pharmacology

Int. J. Neuropsychopharmacology

European Psychiatry

CNS Spectrums

Chinese Journal of Psychiatry

Japanese Journal of Neuropsychopharmacolog

European Neuropsychopharmacology (ENP)

NbN Updates

John Krystal of Biological Psychiatry:

"We applaud the effort to develop a clearer nomenclature for psychopharmacology. We, the editors, are pleased that Biological Psychiatry and Biological Psychiatry: Cognitive Neuroscience and Neuroimaging will participate in this initiative."

NbN Updates

Lynn Wecker, one of the author of "Brody's Human Pharmacology":

"It is about time!!! Thanks so much. I have been teaching this information to medical students and residents for years according to mechanisms and am thrilled that you all have taken on this wonderful project. As a matter-of-fact, I plan on redoing the CNS section of my textbook (Brody's Human Pharmacology) in this way for our new edition. Thanks again."

NbN Updates

Users and distribution (before launching!)

Downloads:

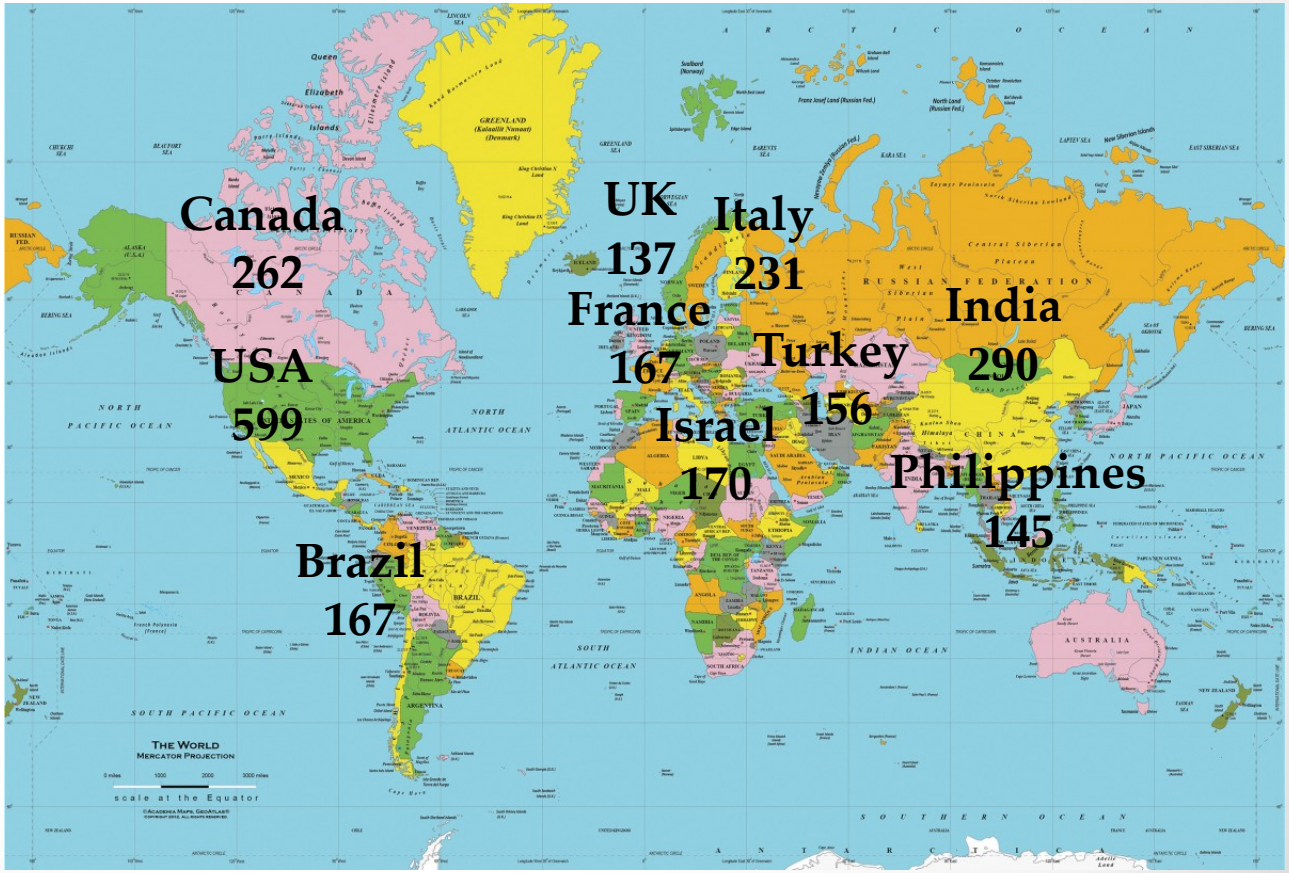
iPhone 5774
Android 4217

App users and distribution (before launching!)

iPhone Total 5774

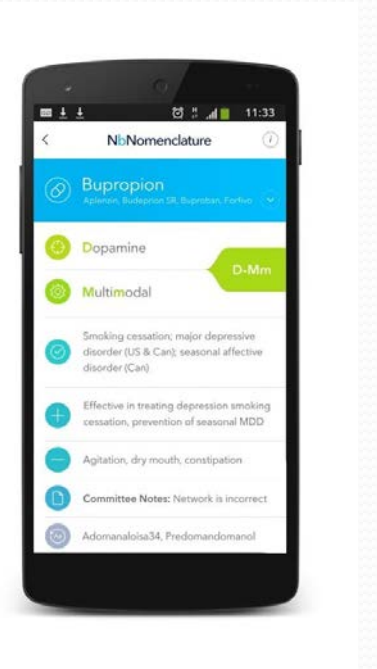
App users and distribution (before launching!)

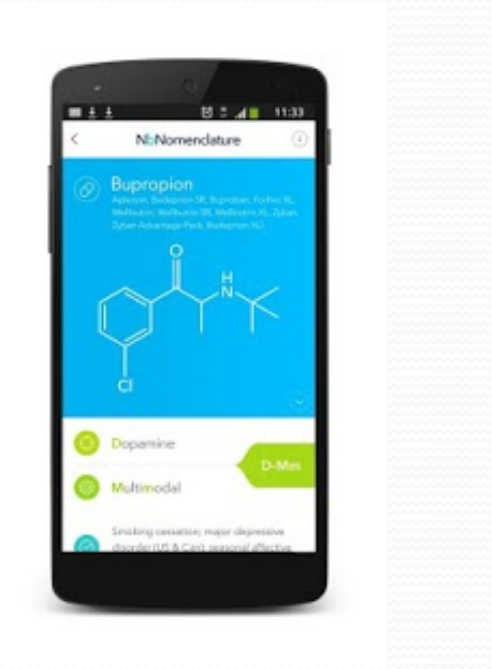
Android Total 4217



Top 10 countries

To download the App, search for *NbNomenclature* on Google Play and iTunes App Store





Thank you

NbN

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Israel