Neuropsychopharmacology (2017) 42, 1927–1928

www.neuropsychopharmacology.org

Commentary

Progress on the Neuroscience-Based Nomenclature (NbN) for Psychotropic Medications

Pierre Blier*[,1], Maria A Oquendo[2] and David J Kupfer[3]

[1]Departments of Psychiatry and Cellular and Molecular Medicine, University of Ottawa, Ottawa, ON, Canada; [2]Columbia Psychiatry, Columbia University, New York, NY, USA; [3]University of Pittsburgh School of Medicine, Western Psychiatric Institute and Clinic, Pittsburgh, PA, USA

Neuropsychopharmacology (2017) **42,** 1927–1928; doi:10.1038/npp.2017.33; published online 8 March 2017

There has not been, until recently, a comprehensive classification of psychotropic agents (Nutt, 2009). Indeed, these medications are generally considered to belong to one of the five classes: antipsychotics, antidepressants, anxiolytics, hypnotics, and mood stabilizers. It is obvious that, even when considering the strict regulatory guidelines, there are numerous medications that cross such denominations (Stahl, 2013). For instance, the 'atypical antipsychotic' aripiprazole has official indications for the treatment of schizophrenia, bipolar mania, and unipolar major depressive disorder (MDD) with inadequate response to antidepressants. Furthermore, another drug of that same family, quetiapine, is often used at doses of 100 mg or less at bedtime as a sedative, at doses of 150–300 mg per day in the treatment of MDD (alone or in combination with an antidepressant), at 300–600 mg per day in bipolar disorder, and at regimens above 600 mg per day for schizophrenia. Using the existing classification, quetiapine could actually belong to all five of the above-mentioned categories. The current approach is thus outdated and untenable.

A task force of members of five scientific organizations (the American, Asian, European, and International Colleges of Neuropsychopharmacology, as well as the International Union of Basic and Clinical Pharmacology) started developing in 2008 a neuroscience-based nomenclature (NbN) with primary focus on neuronal targets rather than on clinical indications. This approach was deemed feasible and radically new because the pre-existing categories could not be logically enriched. The task force recognized that the current knowledge base would not always be sufficient to define the primary target or the correct mechanism of action for certain drugs. Consequently, a cutting-edge scientific framework as developed. The task force realized that as knowledge increases regarding targets and mechanisms of action, and new medications are developed, the framework may need to be adjusted. As such, the committee will continue to meet twice a year to update classifications.

A goal of this classification is to help clinicians initiate the first treatment step and/or help guide the next neuropsychopharmacological step when facing either drug intolerance or resistance based on neuronal targets. Another crucial goal is to help patients accept a prescribed treatment for a condition that is different from its initial indication. This biologically oriented nomenclature for medications may improve compliance and decrease potential stigma associated with certain conditions.

The bases for NbN are first and foremost the pharmacological domains and modes of action. There are 11 pharmacological domains that are all well known to clinicians and include terms like serotonin, dopamine, acetylcholine, and GABA. There are 10 familiar modes of action such as agonist, antagonist, reuptake inhibitor, and enzyme inhibitors. These are established, known terms that when put into practice, will serve to more precisely characterize putative mechanisms of action, while decreasing the occurrence of irrational polypharmacy; an outcome that is especially important with medications targeting a variety of receptors, reuptake transporters, ion channels, and/or enzymes.

There are four additional layers. The first layer enumerates the official indications as recognized by the regulatory agencies (ie, the Food and Drug Administration, the European Medicines Agency, and other governmental organizations). The second layer states efficacy based on randomized controlled trials or substantial, evidence-based clinical data, as well as side effects, not the exhaustive list provided in contemporary monographs, but only the most common ones. The third layer comprises practical notes. The committee used this section to highlight only the important drug interactions, metabolic issues, and specific warnings. The last two layers are thus meant to simplify the clinician's role in providing patients with the most relevant information on their medications. Finally, the neurobiological effects in laboratory animals and humans are summarized in the last layer (Zohar *et al*, 2014). Specific doses and titration

*Correspondence: Professor P Blier, Mood Disorders Research Unit, The Royal's Institute of Mental Health Research, 1145 Carling Avenue, Ottawa, ON K1Z 7K4, Canada, Tel: +1 613 722 6521, Fax: +1 613 761 3610, E-mail: pierre.blier@theroyal.ca
Accepted article preview online 9 February 2017

regimens are not provided as they can vary in different countries.

Attendees of numerous scientific meetings worldwide have been consulted for their feedback of the project as it was being developed. In October 2014 at the annual meeting of the European College of Neuropsychopharmacology (ECNP), a book was distributed to more than 5000 attendees and an app has been made available for free download on the Apple Store and Google Search (Nbnomenclature; http://nbnomenclature.org/). NbN is available on the app in English, Spanish, and Japanese. In the near future, it will be available in German, French, and Chinese. The app can be searched by drug names (brand or generic), pharmacology, mode of action-approved indication, efficacy, and side effects, either alone or in combination. There is also a website describing the nomenclature, and a short video explaining the mission and scope of NbN (Zohar *et al*, 2015).

As mentioned previously, NbN is an ongoing project, updated twice a year with new medications being introduced to the market, the emergence of novel data, and comments that can be provided through the 'Send Feedback' option available on the right sweep function of the app. NbN is endorsed by the initial four Colleges of Neuropsychopharmacology, supported by chief editors of 22 scientific journals, and is being introduced in 2016 to a variety of organizations such as the American Psychiatric Association and the World Health Organization.

With regards to the future for this new classification and neuropsychopharmacology, the ACNP nomenclature task force will be developing in 2017 instructions to authors that will allow them to switch obsolete terms, like 'atypical antipsychotics', to descriptive neuropharmacological terms. For instance, aripiprazole would be referred to as a partial dopamine agonist used for the treatment of psychosis or depression, depending on the investigation. Initially, authors will be encouraged to use this framework but it will not be mandatory. A table designed to help this transition is now available on the NbN website (http://nbnomenclature.org).

FUNDING AND DISCLOSURE

Members of the task force have not been remunerated for their initial and ongoing contributions. The cost for publication of the book and development/maintenance of the upgrades of the application software is supported by the ECNP. PB has no disclosures for this editorial. MAO receives royalties for the commercial use of the Columbia-Suicide Severity Rating Scale and an honorarium for her role as president of the American Psychiatric Association. Her family owns stock in Bristol-Myers-Squibb. DJK receives royalties for the commercial use of the Pittsburgh Sleep Quality Index Scale

REFERENCES

Nutt DJ (2009). Beyond psychoanaleptics—can we improve antidepressant drug nomenclature? *J Psychopharmacol* **23**: 343–345.

Stahl SM (2013). Classifying psychotropic drugs by mode of action not by target disorders. *CNS Spectr* **18**: 113–117.

Zohar J, Stahl S, Moller HJ, Blier P, Kupfer D, Yamawaki S *et al* (2014). *Neuroscience Based Nomenclature*. Cambridge University Press: Cambridge. pp 254.

Zohar J, Stahl S, Moller HJ, Blier P, Kupfer D, Yamawaki S *et al* (2015). A review of the current nomenclature for psychotropic agents and an introduction to the neuroscience-based nomenclature. *Eur Neuropsychopharmacol* **25**: 2318–2325.