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Guest Editorial

Paradoxes of US psychopharmacology practice in 2013: Undertreatment of the severely mentally ill and
overtreatment of minor psychiatric problems

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publication. Dr. de Leon personally develops his presentations for lecturing, has never lectured using any
pharmaceutical or pharmacogenetic company presentation, and has never been a consultant for
pharmacogenetic or pharmaceutical companies. In the past, Dr. de Leon has received researcher-initiated
grants from Eli Lilly (one ended in 2003 and the other, as co-investigator, ended in 2007); from Roche
Molecular Systems, Inc. (ended in 2007); and, in a collaboration with Genomas, Inc., from the NIH Small
Business Innovation Research program (ended in 2010). He was on the advisory boards of Bristol-Myers
Squibb (2003/04) and AstraZeneca (2003). Roche Molecular Systems supported one of his educational
presentations, which was published in a peer-reviewed journal (2005). His lectures have been supported
once by Sandoz (1997), twice by Lundbeck (1999 and 1999), twice by Pfizer (2001 and 2001), three times
by Eli Lilly (2003, 2006, and 2006), twice by Janssen (2000 and 2006), once by Bristol-Myers Squibb
(2006), and seven times by Roche Molecular Systems, Inc. (once in 2005 and six times in 2006).

Running title: 2013 US psychopharmacology practice

Key words: drug prescription; forensic psychiatry; hospitals, psychiatric; mental disorders, diagnosis;
psychiatry; psychopharmacology; psychotropic drugs.

In the opinion of the author, 2013 may someday be seen as an important crossroad in US psychopharmacology practice. But the prescribers of psychopharmacology in 2013 may not be paying attention to its potentially bleak future as pharmaceutical companies discontinue the development of new psychiatric drugs. Instead, psychiatrists may be distracted by the publication of the *DSM-5*, which has led to significant controversies in the field of psychiatric diagnosis. While the future and priorities of psychiatry as a medical discipline are not clear, the use of psychopharmacological drugs in the US population definitely presents a worrisome paradoxical profile, namely, the obvious undertreatment and neglect of severe mental illness and the growing overtreatment of minor psychiatric problems.

The author acknowledges that there is an obvious risk in criticizing the current status of US psychiatry, since his arguments can be used by psychiatry haters or the media to attack his “beloved” medical discipline. Compared with other disciplines, psychiatry is in a weaker position; it shares with psychiatric patients the stigma associated with mental illness. Thus, these critiques are written with the ambivalent feeling of a son who publically criticizes a “sick” mother; he wants her to stop denying and start facing her problems. This is after many years of thinking that it was not a good idea to openly criticize things; it would be better to keep things “private” within the family. Finally, the publication of the *DSM-5* plus the denial by US psychiatry’s leadership¹ of its obvious limitations and the possibility of legitimate critiques have led him to take the risk of “publicly” exposing his critical ideas.

PHARMACEUTICAL COMPANIES ARE ABANDONING PSYCHOPHARMACOLOGY

In the past few years, the high-profile pharmaceutical companies have decided to shut down major research activities in psychopharmacology.^{2,3} This fact has received little attention in psychopharmacology journals other than this one.² Only recently, in 2013, has another journal published a commentary on this issue.³ In 2012, in an important article, Fibiger explained the position of the pharmaceutical companies: (1) antipsychotics, antidepressants and anxiolytics were the result of serendipitous clinical observation while the research of “the past 3 or 4 decades has failed to generate effective, mechanistically novel psychopharmaceuticals” and (2) “the pharmaceutical industry is now well

aware of this fact and has therefore greatly reduced investing.” Fibiger’s recipe for resolving this situation is very painful and requires: (1) major investments in neuroscience research, (2) humility in the face of our ignorance, and a (3) willingness to consider fundamental reconceptualizations of psychiatry itself. One would think that hundreds of psychiatrists worried about the future treatment of their patients would be commenting on this pessimistic future concerning the development of new and better psychiatric drugs. This does not appear to be the case. As of June 12, 2013, there were no published articles quoting Fibiger’s article (<http://thomsonreuters.com/web-of-science/>). Meanwhile, the leaders of the National Institute of Mental Health (NIMH) are not worried; they propose to save drug development,⁴ a slightly less “visionary” view than in 2006⁶ when 21st century psychiatry was only going “to cure” mental illness. The NIMH differs from pharmaceutical companies in that it has no stock holders requiring a report after this failure.

THE DISARRAY SURROUNDING THE *DSM-5*

As this journal is read by many professionals who are not psychiatrists, a discussion of US psychiatry’s historical “dirty laundry” is needed. Before and during the 1980s, psychiatrists in the US had multiple problems but “sectarianism” was probably the first.⁷ In summary, academic psychiatry was dominated by psychiatrists with a psychoanalytic approach, poor diagnostic skills and no scientific training.⁸ A revolt began at Washington University in St. Louis when psychiatrists there reverted back to the diagnostic criteria used by Kraepelin, a German psychiatrist from early in the 20th century. This was the so-called neo-Kraepelinian revolution.⁹ The original neo-Kraepelinians, who described 15 psychiatric disorders, were worried about validity.¹⁰ In a major coup, they “converted” Robert Spitzer, a New York psychiatrist (New York was probably the *sancta sanctorum* of psychoanalytic power). Spitzer outmaneuvered the psychoanalytic establishment and selected many US psychiatrists contaminated by neo-Kraepelinian beliefs to develop the *DSM-III* criteria; the *DSM-III* was published by the American Psychiatric Association (APA) in 1980. At that time, the *DSM-III* appeared to be a breath of fresh air that allowed the development of biological research psychiatry and made US psychiatry the unquestioned

leader of psychiatry around the world. In the process, a “small” inadvertent problem occurred: Spitzer was not concerned about the validity of psychiatric diagnostic categories. He had to deal with quarrelsome psychiatric experts and decided to focus on agreement between experts and interrater reliability.¹⁰ In the process, 265 psychiatric disorders were included in the *DSM-III*.¹⁰ No one was thinking about the possibility that some of these disorders may not be valid.

After the *DSM-III*, the APA published several revisions and/or editions leading to the publication of the *DSM-5* in May 2013. The paradoxical situation is that one of the major critics of the *DSM-5* is Allen Frances, who supervised the development of the *DSM-IV*. Moreover, Frances had to forego using US psychiatric journals as a means of criticizing the *DSM-5*. Recently, he has used an international psychiatric journal¹¹ and an internal medicine journal¹² where his recommendation was “to use the *DSM-5* cautiously, if at all.” The lack of attention to Frances and the exclusion of his criticisms from key psychiatric journals appear to the author to be a new form of sectarianism. The author has written articles detailing this internal fight about psychiatric diagnoses from the scientific point of view¹² but this editorial focuses on the crucial practical relevance of this fight in reference to the prescription of psychiatric drugs in the US. The author is very worried, as is Frances, that the widening of some psychiatric diagnoses may lead to even more prescribing of psychiatric drugs in the US to the wrong patients, while those with more severe mental illness are forgotten. The overdiagnosis of psychiatric disorders in children¹⁴ appears particularly frightening in view of the massive increases of psychopharmacological prescriptions in children.¹⁵ Moreover, the frequent use of antipsychotics¹⁶ in children with attention deficit hyperactivity disorder (ADHD), an off-label use, verifies the idea that psychiatrists may be expected by society to be the leading experts in controlling behaviors in problematic patients independent of whether these behaviors are explained by a severe mental illness or not, or whether they really respond to drug interventions beyond the goal of “sedating” patients who are considered “troublemakers.”

PARADOXES IN US PSYCHOPHARMACOLOGY PRACTICE

Overprescription of psychiatric drugs for minor psychiatric disorders

By reviewing the literature, Frances¹² concluded that in the US psychotropic drugs taken by 20% of the US population generate for the pharmaceutical companies \$18 billion/year from antipsychotics, \$12 billion from antidepressants, and \$8 billion from ADHD drugs. Regarding these costs, there are differences in cost between generic and brand names, so costs may be reduced by progressive changes from brand names to generics,^{17, 16} but the most important clinical question is whether diagnosing 20% of the population taking medications for psychiatric disorders is a number that is too high or too low.

This answer is complex. Frances¹² proposes that 15-20% of the US population has minor psychiatric disorders in which it is hard to distinguish the efficacy of drugs from placebos. If we assume that this is correct, we may be spending billions on very expensive placebos which, by the way, are not innocuous. Psychiatric drugs can kill you if you decide to overdose or if the occasional potentially lethal adverse drug reaction (ADR) occurs when you are taking them as prescribed. Frances appears to get psychiatrists off the hook by quoting a 2004-05 study¹⁹ indicating that 77% of prescriptions for US psychiatric drugs are not written by psychiatrists, but mainly by primary care physicians. Frances¹² believes that US primary care physicians have too little training and insufficient time with the patient to make an accurate psychiatric diagnosis. I do not know your opinion on this issue, but the author's primary care physician, an academic family medicine physician, appears to fit that profile well. The author does not see an easy solution to this overprescribing by non-psychiatrists and, in his experience, the prescribing practices of many psychiatrists is not much better. Even if we assume that psychiatrists are less prone to overprescribe for minor psychiatric disorders that recover spontaneously or with non-specific interventions, psychiatrists cannot handle psychiatric care for the 15-20% of the US population with minor psychiatric problems. The other option may not be better, as psychiatrists have no systems or resources for educating other prescribers about the need to decrease psychiatric medication prescriptions in psychiatric disorders that may respond to other interventions or placebo.

To be fair to psychiatry and psychopharmacology, one needs to acknowledge that pharmaceutical companies have flooded the whole medical market with “lifestyle” drugs²⁰ for the sake of profit, so drug overprescription is not exclusive to psychiatry and is prevalent across all medical specialties.

Undertreatment of severe mental illness

Frances quotes the statistic¹² that 5% of the US population has a severe mental illness. The psychiatric medications of these patients are usually prescribed by psychiatrists. This prevalence sounds approximately right, but the sad truth is that there is no standardized definition of severe mental illness. Most psychiatrists would not disagree that severe mental illness includes schizophrenia, bipolar disorder and severe cases of depression.²¹ The author, who is a “quarrelsome” psychiatrist and likes studying the history of psychiatry and psychopharmacology, would also include an additional syndrome, catatonia, which has specific treatment responses.²² Including catatonia should not increase the prevalence of severe mental illness, since in the author’s experience, many US psychiatrists do not know how to diagnose it. Unfortunately, non-US authors²³ report that psychiatrists in other countries also frequently miss the diagnosis of catatonia. In summary, catatonia should not increase the prevalence of severe mental illness beyond 5% of the US population.

This brings us back to psychiatry’s dirty laundry. Patients with severe mental illness were “warehoused” in insane asylums during the 19th century in the civilized areas of the US (and Europe). As a matter of fact, the APA was founded in 1844 in Philadelphia as the Association of Medical Superintendents of American Institutions for the Insane. Then, between the 1960s and 1980s deinstitutionalization took place in the US and the treatment for these deinstitutionalized people with severe mental illness was poorly funded and separate from the medical treatment of the general population.²⁴ It may not be familiar to non-psychiatrists that, according to a 2010 review,²⁵ the US houses three times more severely mentally ill people in prison than in psychiatric hospitals and that 40% of those hospitalized have been in jail or prison at some time in their lives. Thus, although this has not reached PubMed and is only recently reaching the media,²⁶ psychiatrists working in the penal system are starting

to call jails and prisons the “new asylum”.²⁷ US society as whole is ignoring the fact that this way of “storing” patients with severe mental illness is not only “inhumane” but very expensive.²⁸ In 2013, newspapers all over the country reported significant cuts in state mental health budgets that unequivocally will lead to more people with severe mental illness entering the penal system. Simultaneously, no plans exist for integrating people with severe mental illness into the new health system that the US is trying to develop.

TV and other media project the paradoxical viewpoints that sometimes psychiatrists are “evil controllers” when they are trying to use proven and effective treatments for severe mental illness while at other times psychiatrists are presented as extraordinarily effective in controlling behaviors not explained by severe mental illness that in real life do not respond to psychiatric medications. These paradoxical extremes of undertreatment and overtreatment have also tainted the psychopharmacology practice of the author, a psychiatrist, within the last year. In the process of educating and supervising residents and practicing psychiatrists from the public system who consult him, he has found himself continuously stressing the need for more and better treatment for inpatients with severe mental illness and less psychopharmacological treatment for outpatients with minor psychiatric problems. The worst distress of the year was finding that undiagnosed catatonia continues to be lethal in the US. The most frequent annoyance of the year was reviewing outpatient treatment with residents, which frequently led to the recommendation to stop medications when the patient was willing to consider that option, or at least question the psychiatric polypharmacy, which was not justified, due to the lack of an obvious genuine diagnosis of severe mental illness.

Conclusion

This editorial proposes that 2013 may be viewed in the future as a crossroad for psychiatry, with paradoxical pressures and messages to practicing psychiatrists including (1) the NIMH’s assurance not to worry because it can be successful where pharmaceutical companies have failed, since new and better psychiatric drugs are forthcoming; and (2) the APA’s encouragement to use the *DSM-5*, which further

increases the prevalence of mental illness, and its apparent agreement with overprescription of psychiatric medications to control behaviors even if they are not explained by severe mental illness. Other long-term pressures and messages emanate from (1) pharmaceutical companies, with the assistance of media, that continue to encourage drug use for “lifestyle” enhancement; and (2) TV and other media that continue to project the paradoxical viewpoints that sometimes psychiatrists are “evil controllers” when they are trying to use proven and effective treatments for severe mental illness while at other times psychiatrists are presented as extraordinarily effective in controlling behaviors not explained by severe mental illness that in real life do not respond to psychiatric medications. The most important unheard message which everyone ignores (including the NIMH and the APA) is that people with severe mental illness are not receiving the appropriate treatment and that budgets for psychiatric treatment are “evaporating”. As a result, these patients will increasingly be placed in the penal system, the “new asylum.” If the trend continues, and there is no sign that it will not, psychiatrists may need to rename themselves “alienists,”²⁵ as in the 19th century. As a matter of fact, if psychiatrists do not consider well their priorities and the realities of the 21st century, they may be practicing like 19th century alienists with the only improvement being access to serendipitous drug discoveries from the 20th century.³

Finding solutions for this complex set of problems facing US psychiatry at the beginning of the 21st century is crucial not only for US psychiatry but for world psychiatry, since US psychiatry became the undisputed world leader with the DSM-III. Meanwhile, European psychiatry appears to have been asleep²⁹ since then, and East Asian psychiatry is only beginning to take its first steps.¹³ The needs for 1) a comprehensive research approach which acknowledges that psychiatry is a hybrid discipline,³⁰ and 2) a greater research focus on the social sciences for defining many of the minor psychiatric disorders listed in the DSM-5 have been described in articles by the author¹³ and others.^{30,31} The need for a comprehensive approach to better training psychiatrists in what was called descriptive psychopathology and for modifying psychiatric nosology is described in articles by the author^{13,29} and others.³² Moreover, a new 21st century nomenclature for describing psychiatric symptoms and disorders using current knowledge

may be needed.^{13,33} Although the author is somewhat pessimistic about psychiatry, he is much more optimistic about the possibility of improving psychopharmacology. Fifteen years ago, he decided that the scientific approach had a much more promising future in psychopharmacology than in psychiatry as a whole, and decided to retrain himself as a pharmacologist by learning more about the pharmacokinetic and pharmacodynamic mechanisms of each psychiatric drug so as to better personalize treatment in each patient.³⁴ As psychiatric drugs were mainly a product of serendipity, he is not sure when new breakthroughs will occur, but he is very sure that we can do a much better job in training psychiatry residents and other prescribers by combining the evidence-based approach with pharmacokinetic and pharmacodynamic knowledge in a practical way to better use each psychiatric drug in each patient.³⁵ Moreover, a better job can be done¹³ in stressing the crucial role of medications (and electroconvulsive therapy) in severe mental illness versus the limited role and serious consideration of the medication risks in minor psychiatric disorders, which may respond to other interventions including psychotherapy.

References

1. Lieberman J. Psychiatry: Nothing to be defensive about. *Psychiatric News* July 17, 2013.
Available at: <http://psychnews.psychiatryonline.org/newsarticle.aspx?articleid=1715655> Accessed September 27, 2013.
2. Klein DF, Glick ID, Shader RI. Central nervous system drug development, basic, and clinical research thinking outside the box. *J Clin Psychopharmacol*. 2011;31:553-554.
3. Wegener G, Rujescu D. The current development of CNS drug research. *Int J Neuropsychopharmacol*. 2013;16:1687-1693.
4. Fibiger HC. Psychiatry, the pharmaceutical industry, and the road to better therapeutics. *Schizophr Bull*. 2012;38:649-650.
5. Brady LS, Insel TR. Translating discoveries into medicine: psychiatric drug development in 2011. *Neuropsychopharmacology*. 2012;37:281-283.
6. Insel TR, Scolnick EM. Cure therapeutics and strategic prevention: raising the bar for mental

- health research. *Mol Psychiatry*. 2006;11:11-17.
7. McHugh P. Psychiatry and its scientific relatives: "A little more than kin and less than kind". *J Nerv Mental Dis*. 1987;175:579-583.
 8. Wilson M. DSM-III and the transformation of American psychiatry: a history. *Am J Psychiatry*. 1993;150:399-410.
 9. Decker HS. How Kraepelinian was Kraepelin? How Kraepelinian are the neo-Kraepelinians?--from Emil Kraepelin to DSM-III. *Hist Psychiatry*. 2007;18:337-360.
 10. Dean CE. The death of specificity in psychiatry: cheers or tears? *Perspect Biol Med*. 2012;55:443-460.
 11. Frances A. The new crisis in confidence in psychiatric diagnosis. *Ann Intern Med*. 2013 May 17. doi: 10.7326/0003-4819-159-3-201308060-00655. [Epub ahead of print].
 12. Frances A. The past, present and future of psychiatric diagnosis. *World Psychiatry*. 2013;12:111-112.
 13. de Leon J. Is psychiatry scientific? A letter to a 21st century psychiatry resident. *Psychiatry Invest*. 2013;10:205-217.
 14. Frances A, Batstra L. Why so many epidemics of childhood mental disorder? *J Dev Behav Pediatr*. 2013;34:291-292.
 15. Parens E, Johnston J. Understanding the agreements and controversies surrounding childhood psychopharmacology. *Child Adolesc Psychiatry Ment Health*. 2008;2:5.
 16. Mark TL. For what diagnoses are psychotropic medications being prescribed?: a nationally representative survey of physicians. *CNS Drugs*. 2010;24:319-326.
 17. Greenblatt DJ, Hartz JS, Shader RI. Psychotropic drug prescribing in the United States: extent, costs, and expenditures. *J Clin Psychopharmacol*. 2011;31:1-3.
 18. Mark TL, Kassed C, Levit K, et al. An analysis of the slowdown in growth of spending for psychiatric drugs, 1986-2008. *Psychiatr Serv*. 2012;63:13-18.

19. Mark TL, Levit KR, Buck JA. Datapoints: psychotropic drug prescriptions by medical specialty. *Psychiatr Serv.* 2009;60:1167.
20. Le Fanu J. *The Rise and Fall of Modern Medicine.* New York, NY: Carrol & Graf, 1999.
21. Horvitz-Lennon M, Kilbourne AM, Pincus HA. From silos to bridges: meeting the general health care needs of adults with severe mental illnesses. *Health Aff (Millwood).* 2006;25:659-669.
22. Fink M. Rediscovering catatonia: the biography of a treatable syndrome. *Acta Psychiatr Scand Suppl.* 2013;441:1-47.
23. Healy D, Mangin D. The once and future psychiatry. *Acad Med.* 2009;84:418-420.
24. Torrey EF. *Out of the Shadows: Confronting America's Mental Illness Crisis.* New York: Wiley, 1997.
25. Torrey E, Kennard A, Eslinger D, et al. *More Mentally Ill Persons are in Jails and Prisons than Hospitals: A Survey of the States.* Treatment Advocacy Center, May 2010. Available at: http://www.treatmentadvocacycenter.org/storage/documents/final_jails_v_hospitals_study.pdf
Accessed September 27, 2013.
26. Fields G, Phillips EE. The new asylums: jails swell with mentally ill. *Wall Street J.* September 26, 2013. Available at: <http://online.wsj.com/article/SB10001424127887323455104579012664245550546.html>
Accessed September 27, 2013.
27. Knoll JL. The return of the alienist. *Medscape.* May 10, 2013. Available at: <http://www.medscape.com/viewarticle/803662> Accessed September 27, 2013.
28. Swanson JW, Frisman LK, Robertson AG, et al. Costs of criminal justice involvement among persons with serious mental illness in connecticut. *Psychiatr Serv.* 2013;64:630-637.
29. de Leon J. A post-*DSM-III* wake-up call to European psychiatry. *Acta Psychiatr Scand.* 2013 Sep 12. [Epub ahead of print]
30. Berríos GE. Psychiatry and its objects. *Rev Psiquiatr Salud Ment.* 2011;4:179-182.

31. Van Os J. Solutions for patients depend on whether we can bridge the divide between social and natural science research approaches in the area of mental health. *Rev Psiquiatr Salud Ment.* 2012;5:135-138.
32. McHugh PR. Striving for coherence: psychiatry's efforts over classification. *JAMA.* 2005;293:2526-2528.
33. Marková IS, Berrios GE. Epistemology of mental symptoms. *Psychopathology.* 2009;42:343-349.
34. de Leon J. The future (or lack of future) of personalized prescription in psychiatry. *Pharmacol Res.* 2009;59:81-89.
35. de Leon J, Chambers, A, Hyatt M, et al. *A Practitioner's Guide for Prescribing Antiepileptics and Mood Stabilizers for Adults with Intellectual Disabilities.* New York: Springer Verlag, 2012.