As the United States considers how best to restrain the growth of healthcare costs while ensuring quality and access, the potential economic impact of proposals for enhancement medicine should not be overlooked. This essay makes the case that the practice of neuroenhancement, if it were to become widespread, would infringe upon the ethical principle of distributive justice.

There is growing interest in cognitive performance enhancement pharmaceuticals and uncertainty about how to guide their appropriate use.[i] Licensed, off-label and illicit use of stimulants and other drugs that sharpen mental focus, sustain wakefulness, increase alertness, improve memory or otherwise enhance cognitive capacity has increased among healthy students and professionals.[ii] Some pharmaceutical companies have targeted ‘lifestyle drugs’ prescription products used to improve quality of life rather than alleviating disease as a potential market for lucrative growth.[iii]

The question of whether cognitive enhancing drugs developed to treat the sick should be prescribed also to healthy individuals raises many interesting ethical and social challenges. Debate over whether and how widely to open the door to what has been called ‘cosmetic neurology’[iv] has focused on questions of safety, standards of evidence for efficacy, informed consent, autonomy and its limits, the nature of health, the proper role of medicine in society, conflicts of interest, coercive influences, the commodification of human thought, the dignity of human nature as given, and justice.

In regard to justice, three types may be distinguished: commutative, social, and distributive justice. Objections to students taking stimulants to obtain a performance edge on academic examinations or athletes exceeding their
natural abilities by taking performance-enhancing drugs appeal to the principle of *commutative* justice, which calls for fairness in competition. Commutative justice would be violated if a pharmacologically enhanced professional, scholar, or athlete were to achieve success in a way that placed others at a disadvantage. Moreover, it would be unclear whether human achievement enhanced through pharmacologic means would truly be earned and worthy of value.

The principle of *social* justice recognizes society’s obligation to enable all its citizens to be productive participants through equality of opportunity. The use of medication in patients with cognitive disorders to restore mental function to as near as possible to normal in order to enable full participation in society would be consistent with the principle of social justice.

Taking the idea of social justice a provocative step further, some ethicists are asking, why withhold from anyone the benefits of medication that would boost brain function? Should efforts toward social justice translate to ensuring equal opportunity for everyone to rise above the status quo for humanity in general? Greely and colleagues, for example, argue for making enhancements widely available while managing their risks. They write:

> We should welcome new methods of improving our brain function. In a world in which human workspans and lifespans are increasing, cognitive enhancement tools - including the pharmacological - will be increasingly useful for improved quality of life and extended work productivity, as well as to stave off normal and pathological age-related cognitive decline.[v]

Their argument parallels the case for the universal provision of education for the purpose of improving brain function and enabling human flourishing. While all would agree that education and mental wellness are desirable, there is no consensus on the preferred means toward those ends. Pharmacologic enhancement of cognitive function differs fundamentally from education in that it directly alters brain chemistry in ways that could entail incompletely known long-term risks.

Moreover, the prescribing of cognitive enhancing drugs to healthy people could potentially medicalize human intelligence, redefining those once regarded as “well?” as patients in need perhaps of a brain tonic to clarify thought and strengthen memory. In marketing such drugs, it would not be difficult to persuade the public through images and anecdotes that they may be cognitively inadequate, lacking in sufficient mental energy to engage life’s problems with the confidence of a calm and clear mind. Promotional appeals might suggest that nearly anyone is intellectually disadvantaged, in need of a pharmaceutical upgrade, and eligible for ever-stronger enhancements. The quest to satisfy ambitions of cognitive enhancement would prove elusive.

*Distributive* justice concerns the equitable allocation of limited resources. Francis Fukuyama appeals to the principle of distributive justice in expressing apprehension about a possible future society polarized between the haves and the have-nots, which he foresees as a potential danger if enhancing drugs facilitating success were available only to those who could pay for them.[vi] This might be termed the positive argument from distributive justice, in which cognitive enhancing drugs, if they are beneficial, should be made available equitably. There is also what might be termed the negative argument from distributive justice, which is the central argument in this essay. The negative argument affirms that, for medicine, healing the sick represents a greater good than supplying cognitive enhancement to the well, and to redistribute limited resources in the service of the lesser good would amount to poor stewardship.

It is difficult to make a compelling case for expanding the goals of medicine to assume responsibility for making the healthy better than well when the basic medical needs of so many are unmet. Even if consumers were to pay for enhancements out-of-pocket, such use would place further demands on medical resources, including time on physicians? and nurses? calendars, diagnostic efforts to assess cognitive symptoms, the time
needed for informed consent discussions, testing to monitor side effects, and medical treatment of adverse
effects when they occur. Since medical resources are finite, and in some quarters scarce, their just distribution
should first ensure that the medical needs of the sick are met before enlarging the healthcare industry routinely
to accommodate enhancement requests from the healthy. Accordingly, enhancement medicine would all too
easily become problematic from the standpoint of distributive justice.

Mitchell and colleagues offer a cautionary perspective:

> When enhancement is the sole intention of the use of biotechnology, when there is no disease
present but only the desire to pursue perfection,immortality,super performance,a competitive
edge,and so forth, there seems little justification for physician participation and good reasons for
morally excluding it.[vii]

The potential for enhancement medicine to jeopardize the availability of resources for traditional medicine
would depend on how widespread the use of such drugs were to become and how intensively their health risks
would require medical supervision and monitoring. Such utilization proved difficult to estimate in the case of
sildenafil,which was introduced in 1998 for the treatment of erectile dysfunction,and which has also been used
by many without a documented complaint or diagnosis of erectile dysfunction.[viii] Despite initial fears that
primary care would be overwhelmed with requests for prescriptions,demand was found to be lower than early
expectations.[ix]partly because of the growth of Internet-based prescribing.[x]In the case of
neuropharmaceuticals,however,and particularly for drugs that stimulate the neurochemistry underlying mood
or addictive behaviors, it would be difficult to monitor safety adequately over the Internet.

Initial indications of the potential demand among the healthy for cognitive enhancing drugs,while similarly
difficult to predict,suggest that the potential demand may be enormous. The expanding off-label uses of
modafinil,for example,now exceed 90% of prescriptions[xi]in a market that,for this drug alone,approached
$1 billion for the year 2008.[xii]

Other forecasts are also relevant. Current projections foresee a coming shortage of U.S. physician supply
adequate to meet the need for medical care within the next 15 years,especially for geriatric and specialist
services.[xiii]Adding enhancement services could widen the disparity between physician supply and demand
for healthcare services and exacerbate the projected physician shortage.

A further consequence of designating enhancement requests to be the proper business of healthcare
professionals would be that they could become regarded as commensurate with medical needs. Proposals for
healthcare rationing might then prioritize treatments and enhancements along an overlapping scale. Peter Singer
has advocated that healthcare decisions be based on a quality-adjusted life-year instrument in order to compare
the benefits achieved by different forms of healthcare.[xiv]Within that scheme,a drug that enhanced cognitive
capacity for a healthy individual might be authorized and reimbursed by a third party insurer or government
agency, whereas the same drug might be denied for a patient with dementia, if the estimated utilitarian
increment in quality of life were judged to be greater in the first case.

The future of healthcare is now being shaped by discoveries in neuroscience,by ethical discussions regarding
the wise use of biotechnology,and by developments in national policy. Within coming years,an increasing
number of lifestyle drugs can be expected to reach community and Internet-based pharmacies,including more
potent "smart pills" targeted to the molecular basis of specific brain functions.[xv]The debate over appropriate
off-label use for purposes of cognitive enhancement will likely intensify. Depending on the choices made,a
possible scenario could require patients with acute and chronic illness in need of treatment to compete for
services alongside healthy individuals seeking medical expertise for personal enhancements.
Although answers to many of the ethical questions surrounding cognitive enhancing pharmaceuticals may remain unclear, the professional duty of medicine to care for the sick is indisputable. The realization of enhancement medicine would risk dividing professional loyalty by diverting attention and medical resources from the sick, to whom society has a moral obligation to ensure access to medical care.

Editor's Note: This essay was originally presented at the Neuroethics Society meeting, Washington, D.C., November 2008, under the title, "The implications of cognitive enhancement for healthcare resource allocation decisions," and is adapted from an article that appeared in Ethics & Medicine: An International Journal of Bioethics Volume 26, Issue 1, Spring 2010, and is used by permission. The views expressed herein are Dr. Cheshire's own and do not necessarily reflect the positions of Mayo Clinic, USA.


