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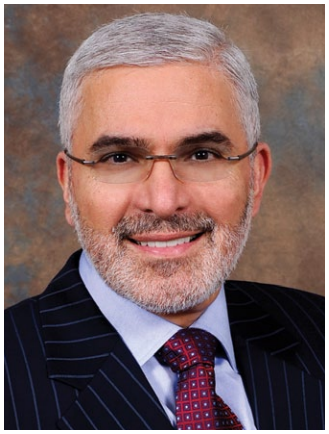

Henry A. Nasrallah, MD
Editor-in-Chief

Psychiatric futurology

Few things capture the imagination like the future. I recall how after reading Alvin Toffler's seminal book *Future Shock* in college, I was fascinated by how the future could change us as people and as a culture.

During medical school and psychiatric residency, the breathless pace of scientific discoveries—especially in neuroscience—prompted me to dream about the potentially stunning medical breakthroughs of the future. My frustrations about severe, disabling psychiatric brain disorders were tempered by hope that tomorrow will unfold new knowledge that will unravel the dark mysteries of psychotic delusions, obsessive-compulsive disorder (OCD) rituals, intractable narcissism, suicidal urges, and homicidal impulses. The future, I frequently mused, will provide all answers for definitive diagnoses, effective treatments, prevention, and cures for all psychiatric disorders.

Hope for restoring wellness for our suffering patients continues to sustain me and my fellow psychiatrists. The ongoing gush of neuroscience advances that elucidate the divine details of brain and mind continue to inspire us. However, we are getting impatient with the slow translation of groundbreaking basic science discoveries into new and dramatic clinical applications for our long-suffering patients. A collective mantra is building up: We want our future and we want it now!

Evolving advances are lurking in our future, some of which already are palpable and we hope may soon become clinical realities.

Only intensive research can accelerate our future; everything we know today was a research project a few years ago

Diagnostic lab tests. Biomarkers for psychiatric disorders will, in the near future, help our specialty transcend the DSM's syndromal approach and help us more decisively clinch diagnoses and proceed to specific treatment. The biggest challenge remains the etiologic heterogeneity of psychiatric disorders, which can undermine the reliability of a single test. I predict that a combination of tests will have to be used to confirm a given clinical diagnosis.

Pharmacogenetics. Momentous advances have been made in identifying cytochrome enzyme mutations that render individuals poor metabolizers or extensive metabolizers; yet few clinicians have access to a laboratory to provide them with their patients' cytochrome activity profile so they can select the right dose to maximize response and minimize side effects. Furthermore, research is proceeding to identify genes and single nucleotide polymorphisms that predict response to a given antipsychotic, antidepressant, or mood stabi-

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lizer. Similarly, pharmacogenetic research is pursuing methods of predicting patients' potential to develop a specific adverse event but these methods are not yet accessible in clinical settings and the cost remains prohibitive.

Brave new formulations. Despite evidence of high rates of nonadherence with oral medications among schizophrenia patients, long-acting antipsychotics that ensure adherence are used infrequently. Patches and sublingual tablets are now available. The future may bring additional formulations with advantages such as immediate onset of action (eg, intravenous antidepressants or mood stabilizers) or more localized CNS activity (eg, intrathecal antipsychotic drug administration) to avoid organ-system complications. Inhalable formulations may be around the corner and could offer quicker onset of efficacy.

Neuroimaging-guided psychotherapy. Functional magnetic resonance imaging (fMRI), which shows what brain region is activated, some day will enable psychotherapists to visualize their patients' brain activity in real time as they evoke memories, elicit insight, or trigger anger or sadness. The emotional and cognitive circuitry will provide a road map of patients' mental archaeology and may help document psychotherapeutic response and recovery.

Brain repair. Evidence indicates that ailing brains can be structurally repaired. Brain disorders such as schizophrenia, bipolar disorder, unipolar depression, and OCD show gray and white matter deterioration, and acute episodes often are associated with detrimental neuroplastic changes. Advances in neuroprotection, neurogenesis, neurotrophic factors, and antiapoptotic cascades will give psychiatrists a toolbox to regenerate, reconnect, and resculpt brain regions in their patients by using specific pharmacologic agents and evidence-based psychotherapy.

Deep brain stimulation (DBS). Of all neurostimulation techniques, DBS may have the most promising psychiatric applications. Studies suggest applications for refractory depression, OCD, or psychosis. The future will bring insights into how DBS can used to bring back to life a dormant corner of the brain or turn off a rogue neural circuit. DBS is a standard treatment for Parkinson's disease and may become so for psychiatric conditions.

The future can fulfill our dreams and aspirations for curing or preventing psychiatric illness. But let us not forget that only intensive research can accelerate our future. Everything we know today was a research project a few years ago and the research of today is the treatment of tomorrow. Thus, recruiting more psychiatrists into research careers is a key and indispensable ingredient for a brighter future for us and our patients.

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