



Henry A. Nasrallah, MD
Editor-in-Chief

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We must envision the future of psychiatry as dramatically different from the present

It's time for moonshot thinking in psychiatry

"I believe that this nation should commit itself to achieving the goal, before the decade is out, of landing a man on the Moon and returning him safely to Earth."

**President John F. Kennedy,
May 25, 1961**

Despite significant progress, there remain many unmet needs in psychiatry. These include a granular understanding of the neurobiology of various psychopathologies, an objective and valid diagnostic schema, and disease-modifying treatments for chronic and disabling psychiatric disorders. Several moonshots are needed to address those festering needs.

A "moonshot" is an extremely ambitious, dramatic, imaginative, and inspiring goal. Landing on the Moon was generally believed to be impossible when President Kennedy boldly set that as a goal for the United States in 1961. Yet, 8 short years later, on July 20, 1969, Neil Armstrong stepped off the lunar module ladder onto the Moon's surface, a feat that captured the imagination of the nation and the world. I distinctly remember watching it on television with amazement as a young boy. It was a surreal experience. That's what achieving a moonshot feels like.

Successful organizations should always have 1 or more moonshots

(American Psychiatric Association and National Institute of Mental Health [NIMH], are you listening?). Setting lofty goals that require monumental determination and effort to accomplish will have a transformative, long-lasting impact. The construction of the Panama Canal to connect 2 oceans and the Manhattan Project to develop the first nuclear bomb, which ended World War II, are examples of moonshots that continue to reverberate. A more recent moonshot is the driverless car, which in the past was a laughable idea but is now a reality that will change society and the world in many ways. Innovative billionaire moguls now speak loudly about colonizing Mars, which sounds improbable and highly risky, but it's a moonshot that may be achieved within a few years. Establishing world peace is a moonshot that requires collective Kennedyesque vision and motivation among world leaders, which currently is sadly lacking.

So, for contemporary psychiatry, what is the equivalent of landing on the Moon? Here is the list that pops in my brain's mind (let us know which of these would be your top 3 moonshots by taking our survey at <https://bit.ly/3qkKqTa>):

- A cure for **schizophrenia** (across positive, negative, and cognitive symptom domains)
- A cure for **mood disorders**, unipolar and bipolar (including suicide)

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henry.nasrallah

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- A cure for **Alzheimer's disease** and other dementias
- A cure for **personality disorders**, especially antisocial and borderline
- A cure for the **visceral hatred** across political parties that permeates our society (obviously not a psychiatric category, but perhaps it should be added to DSM because it is so destructive).

Those moonshots may be regarded as absurd, and totally unachievable, but so was landing on the Moon, until it was accomplished. Psychiatry must stop thinking small and being content with tiny advances (which is like changing the chairs to more comfortable sofas on the deck of the Titanic and calling it "progress..."). Psychiatry needs to be unified under the flag of "moonshot thinking" by several visionary and transformative leaders to start believing in a miraculously better future for our patients. But to pave the way for moonshots in psychiatry, the leading organizations must collaborate closely to open the door for unprecedented scientific and medical breakthroughs of a moonshot by:

1. Lobbying effectively to secure massive funding for research from federal, state, corporate, and foundation sources (perhaps convincing the Gates Foundation that schizophrenia is as devastating worldwide as malaria may bring a few badly needed billions into psychiatric brain research).

2. Reminding members of Congress that in the United States, costs

associated with psychiatric brain disorders total an estimated \$700 billion annually,¹ and that this must be addressed by boosting the meager NIMH budget by at least an order of magnitude. The NIMH should disproportionately invest its resources on severe brain disorders such as schizophrenia because breakthrough advances in its neurobiology will provide unprecedented insights to the pathophysiology of other severe psychiatric brain disorders.

3. Partnering intimately with the pharmaceutical industry in a powerful public-private coalition to exploit the extensive research infrastructure of this industry.

4. Creating the necessary army of researchers (physician-scientists) by providing huge incentives to medical students and psychiatric residents to pursue careers in neuroscience research. Incentives can include paying for an individual's entire medical education and research training, and providing generous salaries that match or exceed the income of a very successful clinical practice.

5. Convincing all psychiatric clinicians to support research by referring patients to research projects. Clinical psychiatrists are badly needed to care for the population, but they must be reminded that every treatment they are using today was a research project in the past, and that the research of today will evolve into the treatments (or cures) of tomorrow.

Pursuing lofty moonshots via innovative research is very likely to enhance serendipity and lead to unexpected discoveries along the way. As Louis Pasteur said, "chance only favors the prepared mind."² Moonshot thinking in psychiatry today is more feasible than ever before because of the many advances in research

Pursuing lofty moonshots is likely to lead to unexpected breakthroughs

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methods (neuroimaging, pluripotent cells, optogenetics, CRISPR, etc) and complex data management technologies (big data, machine learning, artificial intelligence), each of which qualifies as a preparatory moonshot in its own right.

Given the tragic consequences of psychiatric brain disorders, it is imperative that we “think big.” Humanity expects us to do that. We must envision the future of psychiatry as dramatically different from the present. Moonshot

thinking is the indispensable vehicle to take us there.



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