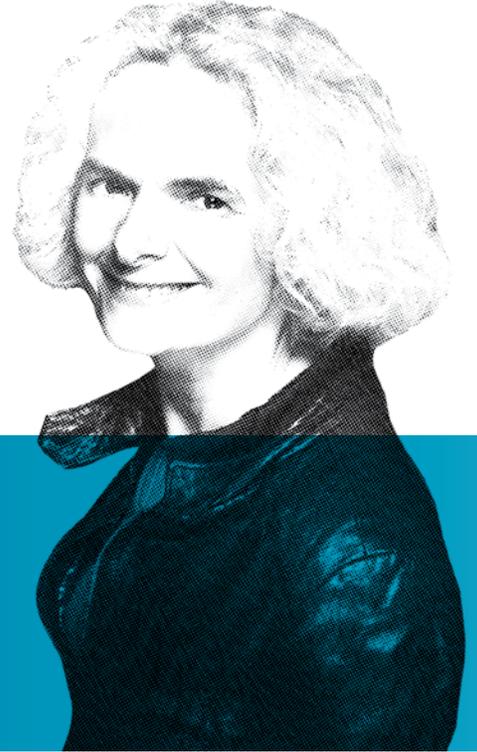


How Collaboration Can Change the Way We Understand Addiction



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Scientific partnerships are critical for understanding the complexity of addiction. Our knowledge in this area is expanding rapidly, and one challenge we now face is how to communicate these discoveries.



What are some of the best examples of collaboration you have seen while leading the National Institute on Drug Abuse?

Volkow: In all areas of research and in all fields of medicine, the need to collaborate is much greater than it was in the past. Drug use and addiction are influenced by many genetic, biological, environmental and social factors. Collaborations are critical for understanding the interactions among these factors and how they contribute to the risk for addiction and other negative consequences of drug use. To achieve a full understanding of the

complexity of the human brain and behavior, for example, you need powerful tools and methods that capture a richness of data spanning genetic, molecular, brain-imaging, behavioral, clinical, social and environmental studies. This requires a diversity of expertise among the scientists doing the work, such as engineering, bio-informatics, statistics, computer science, genetics and neuroscience, among others, to enable the data to be analyzed in ways that integrate the information for a comprehensive picture of how it all fits together.

Some good current examples of this are President Obama's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative and the recently launched Adolescent Brain Cognitive Development, or ABCD, Study. The BRAIN initiative is working to accelerate the development of new technologies that will enable researchers to view the brain in action, from individual brain cells to complex neural circuits, to shed light on the complex links between brain function and behavior. The ABCD initiative will be the largest long-term study of brain development and child health in the United States, following more than 10,000 children for 10 years beginning at ages 9-10. It will use advanced brain imaging, interviews and behavioral testing to determine how childhood experiences — for example participation in extracurricular activities; playing video games; sleep habits; head injuries from sports; or experimentation with alcohol, tobacco, marijuana or other substances — interact with a child's changing biology to affect brain development and, ultimately, social, behavioral, academic, health and other outcomes.

What will public health campaigns about drug use and addiction look like 10 years from now? How will research change our understanding of these complex problems?

Volkow: Public health campaigns should change dramatically as a function of both the increasing depth of knowledge on drug use and addiction and the advancement of technology. The National Institute on Drug Abuse has a significant investment in prevention science that is focused on how children, families, educators and communities can be reached to minimize risk factors and strengthen protective factors to reduce drug use and its consequences. This research is informed by our growing understanding of the neurobiology of addiction. As we learn more about the causes and consequences of drug use and addiction, the challenge becomes how to communicate that knowledge in a salient way.

How will we do that in the future? Well, I think it will be driven by advances in technology. Researchers are looking at how to better leverage things like social media, mobile devices, wearable sensors and other technologies to better reach, educate and engage at-risk children and people in a position to influence them, such as parents and teachers.

Ten years from now I can also see being able to tailor interventions to the individual. There are many factors that influence whether someone will use drugs and whether they will develop an addiction.

A person's genes, their home environment, whether their friends use drugs and many other factors play a role, and we know that not everyone uses drugs for the same reason. But our campaigns tend to use the same messaging for all. In the future, we might be able to look at your genetic profile or environmental risks and target an intervention that will have a greater impact.

What role can community outreach groups play in advancing this research? What roles do patients play, and how are their voices integrated into the research process?

Volkow: Patient and community voices can have a tremendous impact in terms of fostering research and deployment of solutions. Because addiction is such a stigmatized disorder, patients, families and people in recovery have only recently started to come together in a strong way to speak about and advocate for their cause. Many are still afraid to speak up and say they have a problem. As a result, there aren't as many patient advocates for addiction as there are for other medical conditions. These groups are important in the push for solutions.

As a result of the historical lack of advocacy on this issue, the investment in pharmaceutical development has been minimal, and coverage or reimbursement for medications and treatment is still a problem. These things can be changed by community groups and patient groups coming together to break their silence.