

2011 NIH Sleep Disorders Research Plan: A Rising Tide that Lifts all Boats

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Progress in science is discontinuous and occurs in leaps and bounds rather than by a steady and patient accretion of knowledge.¹ There are many factors that may serve as catalysts for such spurts of paradigm-shifting growth of knowledge and they include innovation, advances in related scientific fields, competition, critical mass of researchers, and a persistent and critical quest for truth.² However, such growth spurts in scientific discovery needs to be harnessed, and focused, by occasional “nudges” of the field towards burning priorities while taking care not to smother novelty and potentially paradigm-shifting research. Such channeling of scientific focus can be accomplished by state-of-the-art reviews and inspirational documents that strategize future research. While the former serve to help us digest the mountain of scientific knowledge accumulated until that point in time, providing a new platform to leap from, the latter guides scientists towards which directions to leap. In an effort to provide such directional guidance the National Institutes of Health (NIH) has released the 2011 Sleep Disorders Research Plan, a strategic document that highlights some of the most promising directions for future ground-breaking research in sleep and circadian disorders with the ultimate goal of bettering the human condition.³ This commentary encourages the interested reader to read the plan in its entirety, highlights some of the salient aspects of the document, and describes the rather interesting process through which it was crafted.

What does the 2011 NIH Sleep Disorders Research Plan mean to the readers of the *Journal*? To the clinical researcher, this document will be of great value in the conception, planning, and development of future research efforts. The plan consists of five overarching goals and under each goal several specific objectives and examples of potential scientific opportunities. Goal One focuses on basic research, while Goals Two through Five are likely to be of more particular interest to the readership of the *Journal*. While Goal One focuses on the priority areas for the basic science researcher, the clinical-translational researcher would greatly benefit by gaining insight as to what is “hot” in the bench research pipeline and what is perhaps ripe for translation to the bedside.

Goal Two identifies rich opportunities for clinical and epidemiological research to, “Identify genetic, pathophysiological, environmental, cultural, lifestyle factors, and sex and gender differences contributing to the risk of sleep and circadian disorders and disturbances, and their role in the development and pathogenesis of comorbid diseases, and disability.” Goal Three is of particular value to the clinical trials specialist and identifies

significant opportunities that aim to, “Improve prevention, diagnosis, and treatment of sleep and circadian disorders, chronic sleep deficiency, and circadian disruption, and evaluate the resulting impact on human health.” Goal Four, on the other hand, highlights health services research opportunities that may, “Enhance the translation and dissemination of sleep and circadian research findings and concepts to improve health care, inform public policy, and increase community awareness to enhance human health.” And last but very far from least, junior clinical investigators can take heart in Goal Five that acknowledges their importance and reassures them as they struggle to become established and productive researchers in these tough financial times. Goal Five aims to, “enable sleep and circadian research training to inform science in cross-cutting domains, accelerate the pace of discovery and the translation of enhanced therapies from bench to bedside to community.” Such a goal dovetails nicely with the NIH Director’s top goals for invigorating the dwindling pipeline of the future scientific workforce.⁴

To the dedicated clinician with no research aspirations, this document gives insight into what sleep research is poised to accomplish and serves to reassure them that the sleep research community is headed in a thoughtful and deliberate fashion to address the vital issues at the bedside. In a sense, this document has something for everyone, and is meant to be a rising tide that lifts all boats that carry epidemiologists, health services, clinical and basic researchers both within and outside the sleep and circadian research community.⁵ It is vital to recognize that the plan represents consensus-derived opportunities for research within the next 3 to 5 years, and is not meant to be a proscriptive template or in any way limit the research plans of investigators.

From a practical standpoint, this document can also inform program officials and governing bodies of many funding institutions and industry including the largest sponsor of health-related scientific discovery in the world—the NIH—of areas of opportunities for sleep and circadian research. The document provides a framework for each Institute and Center to develop their plans relative to sleep and circadian rhythms. An aspiring grant applicant would benefit from knowing where their proposed research fits into this plan, but they should be advised that the absence of their area of topical interest in the plan may just as likely be emblematic of the novelty of their proposal as it would be of a perceived lack of interest in the sleep field. To the young investigator who is searching for a career line of scientific investiga-

tion, this document presents high-priority research opportunities that may inspire them to pursue and suit their skill set.

The evolution of this document was eye opening and reflective of how knowledge flows and consensus develops in the sleep and circadian rhythms field. The long and arduous process began with request for input (or RFI) from the National Center for Sleep Disorders Research (NCS DR) of the NIH to all relevant stakeholders.⁶ These included individual patients, patient advocacy groups, sleep clinicians, sleep and circadian researchers, research consortia, universities, sleep societies—including the American Academy of Sleep Medicine—and policy makers. All such inputs concerning knowledge gaps and deficiencies in the sleep and circadian field—over 200 separate comments and suggestions—were painstakingly collated by the NCS DR and discussed during an open face-to-face meeting of the Sleep Disorders Research Advisory Board (SDRAB), which was held at the NIH in 2010, attended by many of the afore-mentioned stakeholders and webcast live to interested individuals. It was frequently emotionally trying to hear directly from individual patients ailing from sleep and circadian disorders—in person and in writing—whereby they described how their conditions were impacting their lives and the lives of their near and dear ones. On occasions, it was particularly humbling to hear from individuals who suffered from what one may consider as obscure and rare conditions, whilst such patients lament the lack of attention, awareness, and research that is pertinent to their ailment. Some of these calls for more research, therapies, or just greater awareness of the existence of such conditions by ignorant researchers and healthcare providers were truly humbling. It is quite remarkable as to how little we know and how meager our resources seem.

Such input and presentations were followed by a long and arduous writing process, with contributions from many thought leaders, researchers, clinicians, and professional writers both within and outside the SDRAB and the Trans-NIH Sleep Research Coordinating Committee, which represents 11 institutes, centers, and offices within the NIH, including the NIH Director. Such thought leaders in the sleep and circadian rhythms field contributed significantly to this document through a highly transparent and open process. The range of expertise of the contributors was quite diverse with representation from neuroscience, respiration, psychiatry, psychology, pediatrics and developmental biology, molecular and cell biologists, animal physiology, epidemiology, cardiovascular sciences, respiratory physiology, neurobiology, health care technologists, nursing, behavioral and social science, women's health, child health and development, cancer, veterans health, geriatrics, US Census bureau, health services researchers, health policy makers, and researchers in substance and alcohol abuse.

It was not always smooth sailing. There were indeed differences in opinion, direction, and pace. But, as Kuhn has elegantly pointed out, “What distinguished these differences in beliefs was not one or the others failure to clearly identify the issue at hand—they were all correct in their own way—but, what we will come to see as their incommensurable ways of seeing the world and of practicing science in it.”² In the end, the cacophony of input from various sources was weaved into a chorus of a consensus-derived set of beliefs under the astute leadership of the Chairs of the SDRAB and NCS DR. As always, such a set of beliefs, even for a scientific community, is only relevant to that point in time and is expected to change and hence this plan is

considered to be a living document that could be updated at any time—if we were only so fortunate as to encounter paradigm-shifting research findings—within the next 5 years, which is the expected lifespan of this document.

At this juncture, it is only appropriate to quote Karl Popper who said, “...the growth of knowledge proceeds from our problems and from our attempts to solve them.” This is reflective of not just the growth of science, but also the history of science, with regards to how information evolves as it revolves through an iterative process of knowledge exchange between patients, patient representative groups, clinicians, researchers, the scientific community in the NIH, that culminates in a document that serves as a magnifying lens to focus the rather diffuse and distant shards of light, or knowledge, with pinpoint accuracy on to the burning health issues that confront us. The gauntlet has been thrown. It is up to the sleep medicine community—organizations, individuals, researchers, clinicians, and patients alike—to rise to the challenge by beginning to address these grand opportunities and making their respective contribution to the future advances in sleep disorders research.

CITATION

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