The NIH Toolbox

Setting a standard for biomedical research

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    Blueprint for
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This special issue of *Neurology*® marks the unveiling of a multi-year effort to develop the NIH Toolbox for Assessment of Neurological and Behavioral Function (NIH Toolbox). Constructed based on state-of-the-art psychometric research and novel testing methods, this approach to functional neurologic measurement is as innovative in concept as it is in design. This initiative and the resulting set of instruments, supported through the NIH Blueprint for Neuroscience Research (NIH Blueprint) and built by a development team of more than 250 scientists from almost 100 academic institutions, promises to provide long overdue economies of scale and efficiency to the clinical research enterprise. The NIH Toolbox achieves that end by providing psychometrically sound, cutting-edge, adaptable measures that enable uniformity of measurement, data sharing, and integration of findings in the research setting.

Established in 2004, the NIH Blueprint employs a collaborative framework comprised of 15 institutes, centers, and offices to support research on the nervous system. A primary goal of the NIH Blueprint has been to create research tools and resources of particular benefit to the neuroscience community that would present challenges for any single institute, center, or investigator to develop individually. The NIH Toolbox provides a significant resource for clinical neuroscience research for several important reasons.

- First, it establishes a standard approach to assess cognitive, emotional, sensory, and motor function. At present, there are many clinical studies that collect information on aspects of neural function, but with little uniformity among the measures used to capture these constructs. This lack of common assessments hinders the ability to share and interpret research results. Use of the NIH Toolbox will enhance opportunities for comparison of data across studies and the integration of data from multiple studies.
- Second, the NIH Toolbox creates an opportunity for economies of scale in the research enterprise. This set of well-validated measures promises to maximize the yield from diverse clinical studies by allowing a greater number of significant research questions regarding neurologic and behavioral health to be studied. Importantly, the instruments are designed to capture this information with minimal increment in subject burden and cost. The NIH Toolbox also promises to be an excellent resource for investigators outside the clinical neuroscience arena, for example in cardiovascular or cancer research, who now will have a readily available and easy-to-use set of measures to examine the impact of perturbations in non-neural systems on brain function.
- Third, the NIH Toolbox allows for the adaptation of the measures over time without compromising the continuity of data collection. This dynamic feature guards against the impediments created by more typical "crystallized" measures and tolerates updating in response to advances in science or technology.

It is important to note that the entire range of NIH Toolbox instruments, scoring algorithms, and norms are available electronically and provided royalty-free for the research community (http://www.nihtoolbox.org). Further translation and normative activities as well as validation of the measures in specific patient populations are encouraged. We foresee the NIH Toolbox not only as a national, but also an international, resource. This is an invitation to researchers around the world to join in building our clinical neuroscience knowledge base with these newly assembled tools and, in doing so, advance global public health.

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